CHILDREN WITH DISABITIES AND THEIR DEVELOPMENT, SCHOOL ATTENDANCE, AND SKILL ACQUISITION IN BANGLADESH, PAKISTAN, AND GHANA

By

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ABSTRACT

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Children with disabilities in the Global South are one of the most marginalized groups in this world. While education enables them to escape from poverty, their schooling and learning status remains unclear due to a lack of comparable and comprehensive data. However, a new round of international household surveys overcomes this issue. Thus, I aim to understand their schooling and learning status and characteristics using the social and medical models of disability with the novel dataset from Bangladesh, Pakistan, and Ghana. I analyze these datasets using the linear probability model, logit model, and household-fixed effects model.

The first part of my study examines the associations between disabilities and schooling/learning among school-age children. While disabilities are negatively associated with all aspects of schooling and learning in Bangladesh and Pakistan, it is negatively associated with learning and private school attendance only in Ghana. Thus, while the negative associations between disabilities and learning and private school attendance are observed consistently, the degree of negative associations between disabilities and public schooling differs across three countries. Accordingly, even though children with disabilities are one of the most marginalized groups of children in the Global South, global education stakeholders should scrutinize if it is true in their targeted countries to provide better education policy support.

The second part analyzes whether factors predicted by the medical and social model of disabilities modify the associations between disabilities and education among school-age children.

Some factors predicted by the social model of disability, such as household wealth, household location, and sex of a child, slightly modify the associations between disabilities and some aspects of education. However, factors predicted by the medical model, such as severity and type of disability, modify the associations. Especially, the negative associations are significant and large among those with severe disabilities and both types of disabilities listed and not listed in the Washington Group Short Survey. Further, although the definition set by the Washington Group does not count children with mild disabilities as children with disabilities, mild disabilities are slightly negatively associated with learning. My findings suggest that global education stakeholders should provide support to those with significant disabilities (severe or multiple) to ensure their schooling. At the same time, global education stakeholders currently work on learning poverty and learning loss, but even children with mild disabilities should be prioritized to realize their targets.

The third part scrutinizes if the associations found in the first and second parts can be observed even among pre-school age children. Findings between school-age and preschool-age children are similar. Although disabilities are negatively associated with access to early childhood education and child development, the degree of the associations differs across the countries. Further, compared to the factors predicated by the social model of disability, those predicted by the medical model are more significantly negatively associated with early schooling and learning. My findings indicate that global education stakeholders should address the educational needs of children with disabilities even before their primary school entrance.

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KEY TO ABBREVIATIONS

AME	Average Marginal Effects
CCT	Conditional Cash Transfer
CONFEMEN	Conférence des ministres de l'Education des Etats et gouvernements de la Francophonie
DHS	Demographic and Health Survey
EAs	Enumeration Areas
ECDI	Early Childhood Development Index
ECE	Early Childhood Education
FLS	Foundational Learning Skills
GDP	Gross Domestic Product
GNI	Gross National Income
GPI	Gender Parity Index
HH	Household
ICIDH	International Classification of Impairments, Disabilities, and Handicaps
ICT	Information and Communication Technology
IIEP	International Institute for Educational Planning
ILO	International Labor Organization
LMICs	Low- and Middle-Income Countries
LPM	Linear Probability Model
LSMS	Living Standard and Measurement Survey
MDGs	Millennium Development Goals
MEM	Marginal Effects at the Mean

MICS	Multiple Indicators Cluster Survey
MoFEPT	Ministry of Federal Education and Professional Training
MoPME	Ministry of Primary and Mass Education
MSWSE	Ministry of Social Welfare and Special Education
NGO	Non-Governmental Organization
OLS	Ordinary Least square (OLS)
PSU	Primary Sampling Units
S.D.	Standard Deviation
SRGBV	School-Related Gender-Based Violence
SSUs	Special Schools and Units
PASEC	Programme d'Analyse des Systemes Educatifs de la CONFEMEN
RCT	Randomized Controlled Trial
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SDGs	Sustainable Development Goals
SMC	School Management Committees
UCT	Unconditional Cash Transfer
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UPE	Universal Primary Education
USAID	U.S. Agency for International Development

UPIAS	Union of the Physically Impaired Against Segregation
WGDS	Washington Group on Disability Statistics
WG-SS	Washington Group Short Set on Functioning
WHO	World Health Organization

Chapter 1. Introduction

Background

In many low- and middle-income countries (LMICs), disability and economic poverty are tightly linked, and education appears crucial in breaking the vicious cycle of disability and poverty. For instance, Filmer (2008) found the correlation between disability and poverty disappears when a person's educational attainment is considered. In fact, the rate of return to education for people with disabilities is high, more than twice that of people without disabilities (Lamichhane & Sawada, 2013). Despite that education enables children with disabilities to avoid future poverty, they often lack access to educational opportunities. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), about one-third of school-age children are identified with a disability (UNESCO, 2011). Mizunoya et al. (2016) estimated the enrollment gap between children with and without disabilities is about 30% in some LMICs. In other words, nearly half of all children with disabilities still do not access education. In short, in LMICs, people with disabilities are likely to fall into poverty because they are unable to accumulate human capital through education and learning.

However, only about 1% of papers in international comparative education analyze education and children with disabilities. Further, these papers focus on either the social interpretation of disabilities or the dissonance between the global education agenda for children with disabilities and the local education agenda (Brown, 2014). Most of these papers fail to focus on their schooling or learning.

The main reason for this scant attention to schooling and learning among children with disabilities is the lack of data from LMICs that provide information on children and youth with disabilities. Even if datasets in LMICs collect such information, they are usually neither

comprehensive nor internationally comparable datasets. In some cases, datasets collect information related only to salient types of disabilities, such as disabilities in sensing (e.g., hearing and seeing) and mobility, dismissing other types (e.g., intellectual and socio-emotional) (UN Economic and Social Council, 2001). In other cases, datasets do not collect degrees of disability and ask questions in a dichotomous manner, asking, for example, whether or not the respondent has a disability (UN Economic and Social Council, 2001). Even if surveys and censuses collect holistic information about disabilities, educational information from these data sources collects only schooling information, not learning information. Further, although certain national, regional, and global learning assessments collect information on disabilities, most are school-based and fail to reach out-of-school children with disabilities. Regardless of the type of survey (school-based or home-based), such studies ignore preschool children with disabilities, as in the old demographic and health surveys (DHS) in Uganda (2011) and Maldives (2009). This scarcity of datasets makes it difficult for researchers to examine the disability enrollment gap, which is the school enrollment gap between children with and without disabilities, and learning associated with sociocultural and economic factors.

However, the situation is changing. The Washington Group on Disability Statistics, established in 2001, formed a subgroup for child disabilities in 2009. In 2011, the United Nations Children's Fund (UNICEF) participated in this subgroup. In 2016, the subgroup finalized the Module on Child Functioning. Using this module, in 2017, UNICEF initiated the sixth round of the Multiple Indicators Cluster Survey (MICS), which collected disability information for children aged 2–17. Further, thanks to the joint use of the MICS and the DHS by the U.S. Agency for International Development (USAID), as well as the Living Standard and Measurement Survey (LSMS) by the World Bank, these two large international household surveys have been used to

collect disability information with this module in certain countries. These data have now created a new opportunity for analysis.

Although education plays a vital role in helping people with disabilities to avoid poverty, people with disabilities have not realized their rights to access education. The scarcity of research due to the lack of data exacerbates this problem. However, the increase in the availability of international data in recent years could change this situation.

Purpose of the Study

The present study aims to understand the education status of school-age and preschool-age children with disabilities, including their schooling and learning, using recent household datasets from Bangladesh, Pakistan (Punjab), and Ghana.[1] Through this analysis, I aim to generate policy-relevant insights to improve the schooling and learning outcomes for children with disabilities.

To understand the association between disability and education outcomes, I employ two different sets of explanations offered by the social model of disability and the medical model of disability. The social model of disability posits that disability is caused by the way society is organized rather than by a person's impairment (Oliver, 1983; Oliver, 1990; Oliver, 1996). In other words, "Disability is something imposed on top of our impairments by the way we are unnecessarily isolated and excluded from full participation in society" (UPIAS, 1976, p. 14). Society consists of various layers (e.g., family, region, and country), and whether children with disabilities are included or excluded might depend on the characteristics of each layer of society. For instance, a family might prioritize boys with disabilities over girls who have them. Wealthier

[1] In Chapter 4 and Annex 1, I provide more details on the country selection process.

societies might stigmatize disabilities less than poorer societies do. Social ties that help children with disabilities might exist in rural societies but not in urban ones.

Contrarily, the medical model of disability regards impairment as the primary reason for the marginalization of people with disabilities. Therefore, under the medical model, a child with a profound disability (e.g., a severe disability or multiple disabilities) is expected to be more marginalized from society, whereas under the social model, this expectation might not hold. If the medical model is valid, moreover, the classification of disabilities by type and severity would be essential in considering the relationship between disability and educational outcomes.

The three countries I focus on – namely Bangladesh, Pakistan (Punjab), and Ghana – are similar in economic development status. Thus, they may be similar in terms of the resources available to provide reasonable accommodation for children with disabilities. However, socially they differ. For instance, their gender norms, levels of urbanization, and distribution of economic inequality vary significantly. Thus, they provide an ideal set by which to examine whether the associations between disabilities and education change based on the social model and medical model of disability. In COVID times, when fieldwork abroad was infeasible, an additional benefit of studying these countries has been the significant research literature in education, including studies focusing on education for children with disabilities available from each of these countries. This literature has helped me compensate, to some extent, for my inability to travel to these countries in the last two years.

Research Questions

I used MICS data from Bangladesh, Pakistan (Punjab), and Ghana, and I focused on data for children aged 2–4 and 5–17 to answer the following broad sets of questions.

1. Regarding the relationship between disability and educational outcomes, through the first set of research questions I document the associations between disability and school attendance and attainment and disability and learning. Specifically, I ask,
    a. What is the association between disabilities and current school attendance?
    b. What is the association between disabilities and having ever attended school?
    c. What is the association between disabilities and grade attainment?
    d. What is the association between disabilities and private school attendance?
    e. What is the association between disabilities and the acquisition of numeracy and reading skills?
    f. What is the association between disabilities and the acquisition of numeracy and reading skills, and how does it change after accounting for the schooling levels of children with disabilities?
2. Regarding the social model of disability, through the second set of research questions I document how the household wealth, location and sex of the child moderate the relationship between disability and educational outcomes. Specifically, I ask,
    a. Does household wealth moderate the association between disabilities and education?
    b. Does household location moderate the association between disabilities and education?
    c. Does the sex of the child moderate the association between disabilities and education?

3. Regarding the medical model of disability, through the third set of research questions I document the ways in which the type and severity of disability moderate the relationship between disability and educational outcomes. Specifically, I ask,
    a. Does the type of disability moderate the association between disability and education?
    b. Does the severity of disability moderate the association between disability and education?
4. Through the fourth and final set of questions I investigate the relationship between disability and early childhood education. Specifically, I ask,
    a. What is the association between disability and early childhood education access?
    b. What is the association between disability and early childhood development?
    c. Do socioeconomic and demographic factors influence the associations among preschool children?
        i. Does household wealth moderate the association between disabilities and early childhood education?
        ii. Does household location moderate the association between disabilities and early childhood education?
        iii. Does the sex of the child moderate the association between disabilities and early childhood education?
    d. Do the type and severity of disability influence the associations among preschool children?

Significance of the Study

This study contributes to the literature in three distinct ways by using recent advances in education data related to children with disabilities. In the extant literature, few studies address the impact of disabilities on schooling (El-Saadani & Metwally, 2019; Filmer, 2008; Fotso et al., 2018; Mizunoya et al., 2018) or the associations between disability and education (Lamichhane & Kawakatsu, 2015; Luo et al., 2020; Singal et al., 2018; Takeda & Lamichhane, 2018; Trani & Loeb, 2012) in the Global South. Thus, this study contributes new insight to previous studies. Second, the studies on schooling (El-Saadani & Metwally, 2019; Filmer, 2008; Fotso et al., 2018; Lamichhane & Kawakatsu, 2015; Luo et al., 2020; Mizunoya et al., 2018; Singal et al., 2018; Takeda & Lamichhane, 2018; Trani & Loeb, 2012) examine whether socioeconomic and demographic factors influence the causation or association between disabilities and education, implicitly assuming the social model of disability. Other studies, such as Luo et al. (2020) and Singal et al. (2018), disaggregated disabilities and regarded the associations between disabilities and education, relying on the medical model of disability. However, no such study explicitly compares the social and medical model of disability and their associations with educational outcomes. My study includes both the social and the medical model of disability, allowing me to compare the insights generated from these two models. Third, the studies (El-Saadani & Metwally, 2019; Filmer, 2008; Fotso et al., 2018; Lamichhane & Kawakatsu, 2015; Luo et al., 2020; Mizunoya et al., 2018; Singal et al., 2018; Takeda & Lamichhane, 2018; Trani & Loeb, 2012) have examined the association between primary and secondary school attendance and disabilities. However, due to the lack of data discussed above, no study has examined the association between disabilities and preschool children's schooling, although preschool experience is critical for successful school life in primary and secondary school. Thus, to the best of my knowledge, my

study is the first to estimate the strength of the association between disabilities and schooling or childhood development among preschool children.

The rest of the document consists of the following topics: In Chapter 2, I present a literature review. At first, I introduce historical and theoretical backgrounds regarding three types of education for children with disabilities: special education, integrated education, and inclusive education. Then, I discuss what previous literature has uncovered about enrollment and learning among children with disabilities and what remains unknown. Further, I briefly cite papers explaining how various marginalization factors (gender, location, and household wealth) prevent children from accessing school. Finally, I display national characteristics and education policy for children with disabilities in Bangladesh, Ghana, and Pakistan (Punjab). Chapter 2 concludes with research questions. In Chapter 3, I introduce the contexts of the three countries. In Chapter 4, I discuss the data and methodology. Firstly, I show the official school-age range in each country, addressing the dependent variables of schooling and learning. Then, I detail the independent variable, namely the definitions of the types and severities of disabilities. Further, I present the control variables used in the study. Finally, I discuss models and limitations. In Chapter 5, to consider the validity of the social model of disability in the education setting, I examine the associations between disabilities and education and see whether socioeconomic and demographic factors influence the associations. In Chapter 6, to consider the validity of the medical model of disability in the education setting, I scrutinize whether disability type and severity influence the associations between disability and education. In Chapter 7, I check whether the findings from chapters 5 and 6 are even valid among preschool children. Finally, I conclude my dissertation in Chapter 8.

Chapter 2. Literature Review

In this chapter, I review relevant literature to clarify the research gap that leads to my research questions. This literature review section first introduces historical and theoretical backgrounds regarding three types of education systems for children with disabilities: special education[2], integrated education, and inclusive education mainly in LMICs. I then present papers addressing the association between children with disabilities and their schooling and learning and how social factors affect this association. Afterward, I briefly review papers that explain how social factors affect schooling and lessons on how to construct hypotheses about whether social factors affect the association in my target countries. At the end of this section, I introduce the characteristics of the population, economy, and education, as well as key education policies in each of the three study countries: Bangladesh, Pakistan (Punjab), and Ghana.

[2] I found a difference in the terminology of education systems for children with disabilities between the United States and LMICs, especially in the meaning of special education.

In the U.S., special education indicates whole education systems for children with disabilities. For instance, the Individuals with Disabilities Education Act (2004) stipulates "The term "special education" means specially designed instruction, at no cost to parents, to meet the unique needs of a child with a disability, including—(A) instruction conducted in the classroom, in the home, in hospitals and institutions, and in other settings; and (B) instruction in physical education (§ 1401-29)".

However, in the LMICs, special education often refers to education under which children with disabilities are enrolled in schools exclusively for children with disabilities. For instance, the national action plan for persons with disabilities in Pakistan (MSWSE, 2006) uses special education and inclusive education as "severely handicapped and moderately severely handicapped children will continue to require special education centers, while moderately handicapped and mildly handicapped can acquire inclusive education in regular schools (Action 5, p14)".

I follow the terminology mainly used in LMICs. Accordingly, I would like to ask American readers to pay attention to the difference in the terminology of education systems for children with disabilities between this dissertation and the United States.

Children With Disabilities in LMICs

A Brief History of Children With Disabilities in an International Context

Before World War II, in LMICs, education for children with disabilities was either denied or provided by the community informally or by mission schools (Kuroda, 2007). In other words, formal education systems seldom provided education for children with disabilities in LMICs.

However, the UN system established after the war slowly changed this situation (Kuroda, 2007). In 1948, the Universal Declaration of Human Rights was proclaimed. Its Article 26 declared that everyone has the right to education and that education should be directed to the full development of the human personality (UN General Assembly, 1948). It endowed international society with a justification to improve education for children with disabilities. In 1959, the Declaration of the Rights of the Child was adopted, and this declaration expanded and amplified Articles 25 and 26 in the Universal Declaration of Human Rights. Its Principal 7 strengthened the right to education. At the same time, its Principal 5 focused on children with disabilities, declaring, "The child who is physically, mentally or socially handicapped shall be given the special treatment, education and care required by his particular condition" (UN General Assembly, 1959). For the first time, this declaration provided an agreement on and a framework for education for children with disabilities. This framework promoted special education that would address special needs or individual differences through education, mainly separated from regular classrooms or schools.

However, a new trend emerged in the 1980s. In 1981, the International Year of Disabled Persons was proclaimed, and the United Nations Decade of Disabled Persons began in 1983 (Kuroda, 2007). In 1989, the Tallinn Guidelines for Action on Human Resources Development in the Field of Disability was adopted. These movements underscored equal opportunities for people with disabilities and their full social participation, and they were even reflected in the Convention

of the Rights of the Child, in which Article 23 emphasized that states parties should provide conditions ensuring the active participation of children with disabilities in communities, as well as that the needs of developing countries should be considered, in particular (UN General Assembly, 1989). The 1980s thus saw the creation of a movement for the social participation of children with disabilities, resulting in a shift from special education to integrated education.

The 1990s observed a further shift in education for children with disabilities. The importance of inclusive education was underscored, and international attention to education for children with disabilities reached a summit in 1994 when *the Salamanca Statement on Principles, Policy and Practice in Special Needs and a Framework for Action* was adopted. Its Article 3 and 4 urged all governments and international organizations (UNICEF, UNESCO, the United Nations Development Program [UNDP], and the World Bank) to work on inclusive education that enrolled all children in regular schools unless there were compelling reasons to do otherwise (UNESCO & Ministry of Education and Science, Spain, 1994). Thus, at the end of the last century, all neighborhood schools were required to provide reasonable accommodations to all children based on their unique needs to realize inclusive education.

However, the new century began by dismissing education for children with disabilities. In 2000, the World Education Forum adopted the Dakar Framework for Education for All: Meeting our Collective Commitments. Although children with disabilities are mentioned in regional frameworks for action, the leading Dakar Framework for Action cited neither children with disabilities nor inclusive education (UNESCO, 2000). In the same year, the Millennium Development Goals (MDGs) were adopted. The goals relating to education focus on only out-of-school children (Goal 2) and girls' education (Goal 3), neglecting children with disabilities and inclusive education (UN General Assembly, 2000).

The MDGs have attracted many criticisms and neglect of children with disabilities was one of them. The Post-2015 Development Agenda attended to them. In 2006, the Convention on the Rights of Persons with Disabilities and its Optional Protocol were adopted, and its Article 24 was devoted to inclusive education. It stated that state parties should ensure lifelong learning and an inclusive education system at all levels. That is, the education system should not exclude children with disabilities from free and compulsory primary education, nor from secondary education, on the basis of disability, and reasonable accommodation of the individual's requirements should be provided. Further, the system should enable persons with disabilities to participate effectively in a free society (UN General Assembly, 2006).

The Post-2015 Development Agenda resulted in the Sustainable Development Goals (SDGs), of which inclusiveness was a critical component. Among its 17 goals, in addition to those related to education, Goal 8 (jobs), Goal 10 (inequality), Goal 11 (cities and communities), and Goal 17 (partnership and data) explicitly referred to inclusiveness. Unlike the MDGs, the SDGs' education goal (Goal 4) underscored inclusive education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN General Assembly, 2015). Children with disabilities were also mentioned in Target 4.5, which aimed to, "by 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations" (UN General Assembly, 2015).

Progress in education for children with disabilities in LMICs was sluggish and pendular (Kuroda, 2007). Special education had been mainstream practice for a long time after World War II. In the 1980s, the norm of integration appeared in education for children with disabilities and took the place of special education. Then, in the 1990s, inclusive education was mainstreamed, at

least at the global level, if not at the local level. However, it gained momentum only after the Post-2015 agenda.

Two Models of Disability (Social and Medical Model)

Two influential models discussed how to ensure social participation of people with disabilities: medical (individual) and social model of disability.

As the name indicates, the biomedical model of medicine underpinned the medical (individual) model of disabilities, and it assumed that disease was fully accounted for by deviations from the norm of measurable biological (somatic) variable (Engel, 1977). The model had a long history. With the development of medical knowledge and the occupational group of medical investigators in the 18th century, the importance of the experience of patients diminished (Jewson, 1976). In the 19th and 20th centuries, the task of doctors became to elicit information about the objective signs and symptoms of the disease from patients and diagnose the specific biological causes and outcomes, rather than the patient's circumstances or lifestyle (Bury, 2001). However, this model has received criticism since the 1960s, and the following statement from Engel (1977) represented it:

> The existing biomedical model does not suffice. To provide a basis for understanding the determinants of disease and arriving at rational treatments and patterns of health care, a medical model must also take into account the patient, the social context in which he [sic] lives, and the complementary system devised by society to deal with the disruptive effects of illness, that is, the physician role and the health care system. This requires a biopsychosocial model. (p.132)

Accordingly, disabilities were also seen as deviations from the norm and separated from one's circumstances under the medical model of disabilities. However, it also received the same criticism

as the biomedical model did. The idea of the individual model of disability was represented in *International Classification of Impairments, Disabilities, and Handicaps (ICIDH)* published by WHO in 1980. The introduction of the publication stated that its classification was based on the concept of disease, which symbolically depicted disease as a sequence of etiology, pathology, and manifestation (WHO, 1980). Accordingly, disabilities could be presented as a sequence of disease, impairments, disabilities, and handicaps, and each was defined as follows:

> Impairments concerned with abnormalities of body structure and appearance and with organ or system function) resulting from any cause; in principle, impairments represent disturbances at the organ level.
>
> Disabilities reflecting the consequences of impairment in terms of functional performance and activity by the individual; disabilities thus represent disturbances at the level of the person.
>
> Handicaps concerned with the disadvantages experienced by the individual as a result of impairments and disabilities; handicaps thus reflect interaction with and adaptation to the individual's surroundings. (WHO, 1980, p. 14)

However, after receiving criticism, WHO (1980) acknowledged the problem of the individual model of disability in its forward to 1993 reprint "An important task in the revision of the ICIDH will be to clarify the role and interrelationships of environmental factors in the definition and development of the different aspects addressed by the ICIDH, most notably - but not exclusively – handicap" (p.4).

Such criticism was represented by the social model of disability, which was introduced by Oliver (1983) as an antithesis to the dominant individual model of disability (Oliver 2013). Oliver (1990) criticized WHO (1980) because its classification of disabilities assumed normality, which

was in fact culturally and socially constructed, and failed to consider broader aspects of disabilities. Although the social model of disability was introduced by Oliver (1983), he mentioned the Union of Physically Impaired Against Segregation (UPIAS) and Ann Shearer as his predecessors. In its 1976 document, the union stated that it was the society that disabled impaired people, excluding them from full participation (UPIAS, 1976). Shearer (1981) criticized the International Year of Disabled People by pointing out that the aim of the year was to help people with disabilities physically and psychologically by adjusting themselves to society – not for society to adjust itself to include people with disabilities. Both of them criticized society because it imposed avoidable limitations on people with disabilities and influenced Oliver to develop the social model of disabilities.

Oliver (1983) then argued that the rise of capitalism as a mode of production crucially altered the lives of people with disabilities. This new mode of production made people with disabilities politically, economically, and professionally dependent. In sum, not people with disabilities but society itself hindered the social participation of people with disabilities, and society should be accountable for the lack of appropriate support and accommodation.

Elaborating on his previous work, Oliver (1996) devoted one chapter to the education of children/people with disabilities. He criticized special education for being based on the individual model of disability. He also criticized integrated education because it integrated children into an education system, which was part of society that marginalized people with disabilities. Accordingly, Oliver contended education policy, school organization, teachers, and the curriculum to be needed adjustment. He concluded that education should be inclusive instead of integrated.

However, various authors identified that the social model of disability also had limitations. The most common critique was its failure to acknowledge the limitations caused by impairments

themselves (Llewellyn & Hogan, 2002; Shakespeare & Watson, 2001; Thomas, 2004). Palmer and Harley (2012) pointed out that this unsuitableness of the social model of disability in identifying the proportion of the disabled population in need of health and social services became more serious in the Global South due to their limited resource for public service.

Based on such criticism against the social model of disability, Lang (2001) proposed to eliminate this unproductive dichotomy and appreciate both social limitations and the limitations caused by impairments. Leading international organizations working in this field also adopted this standpoint, including the World Bank and WHO. Their 2011 joint publication argued that stakeholders should address barriers in health care, rehabilitation, and support and assistance services, enabling environment, education, and employment conditions that reflected both social and medical models of disability (WHO & World Bank, 2011).

It was not a direct critique of the social model of disability, but various studies (Flintoff et al., 2008; Haegele & Hodge, 2016; Moodley & Graham, 2015) pointed out that even studies in this field based on the social model of disability tended to dismiss the importance of intersectionality and recommended to pay close attention to the intersection between disability and sexism and racism.

Access to School and Learning Skills Among Children With Disabilities in LMICs

The Causal Impact of Being Disabled on Basic School Access

Few studies examined the unmet educational needs of children with disabilities in the Global South. The first attempt was made by Filmer (2008), who exploited within-household differences in disability status and uncovered the magnitude of the disability gap. In 10 of 13 countries, the disability enrollment gap was larger than 20 percentage points, and the gap reached 51 percentage points in Indonesia. In those countries, the impact of disability on the probability of

being in school was the strongest among other marginalization factors (e.g., gender, poverty, and geography). Further, in these countries, most out-of-school children with disabilities never attended school. In Mozambique and India, the gap was around ten percentage points. Chad was the only exception; there, children with disabilities had the same probability of being in school and of ever having attended school as did children without disabilities. The magnitude of the disability gap varied across countries, but this paper did not address the characteristics of that variation.

Mizunoya et al. (2018) performed a similar analysis to that of Filmer (2008), exploiting within-household differences in disability status to examine the magnitude of the disability enrollment gap using data from 15 countries. Mizunoya et al. (2018) also reached a similar result. They found the size of the disability enrollment gap was about 30 percentage points. Further, more than 85% of out-of-school children with disabilities never entered primary school. Unlike Filmer (2008), Mizunoya et al. (2018) analyzed characteristics of variation in the disability enrollment gap across countries. Regarding cross-country differences, they found an inverse U-shape relationship, like the Kuznets curve, between national wealth and the disability-related enrollment gap in primary education. Among low-income countries, the disability enrollment gap was around 20%. However, as their gross national income (GNI) per capita increased, the disability enrollment gap expanded; it reached a zenith of more than 40%, at around 3,000 USD GNI per capita, after which it shrank as national wealth grew. The relationship in the disability enrollment gap for secondary school was linear. As GNI per capita increased, the gap shrank.

Recent studies addressed the disability enrollment gap on a single country basis. El-Saadani and Metwally (2019) analyzed the case of Egypt using the Household Observatory Survey, Round 13. They focused on the youth 15 to 29 years of age and analyzed the impact of disabilities on whether or not a child ever attended a school. Their methodology resembled that of Filmer (2008)

and Mizunoya et al. (2018), but theirs was a random-intercept logistic model. They revealed the likelihood of youth not attending school was 14 times higher among those with one or more disabilities than among their peers without disabilities, and the impact of disability on school enrollment was the strongest, outweighing all other factors. Fotso et al. (2018) analyzed the case of Cameroon using DHS-MICS 2011 data. They adapted the household-fixed/random-effect model that other researchers used (Filmer, 2008; Mizunoya et al., 2018; El-Saadani & Metwally, 2019). The extended family was more common in LMICs than in high-income countries, and it was plausible to consider that biological children and foster children might receive different educational investments and experience different likelihoods of disabilities. Thus, they proposed to use a biological siblings-fixed effect rather than a household-fixed effect model.

However, they found that the size of the disability enrollment gap was quite similar across ordinary least square (OLS), household-fixed effect, and biological sibling-fixed effect models. The OLS model was a simple multiple regression model that did not consider the presence of bias caused by unobservable characteristics, which simultaneously influenced the prevalence of disabilities and school access. Unobservable regional and household characteristics were examples of such factors. For instance, a region might have a poor health system and a scarcity of school supplies, resulting in more disabilities and less access to school. A household might be less willing to provide child care, which might lead both to preventable child disabilities and to lower school enrollment among children. In either case, if we lacked variables to appropriately capture such characteristics, the OLS result would be biased. In other words, disabilities seemed to cause lower access to school when the relationship was in fact driven by other unobserved regional (e.g., poor infrastructure) or household (e.g., neglect) factors causing both disabilities and unenrollment.

The household-fixed effect model could overcome these limitations of OLS by comparing children with and without disabilities in the same household. However, in the context of Africa and South Asia, the household-fixed effect model might still yield biased results due to the prevalence of extended family or child adoption. Supposed families were reluctant to adopt children with disabilities and had unobservable differential willingness to provide care and education for biological children and adopted children. In that case, the household fixed-effect model could still yield a downwardly biased estimate. The biological siblings-fixed effect model could address this type of bias so that unobservable genetic and parental preference would not be as significant; rather, being disabled would itself affect school enrollment.

However, the results of Singal et al. (2018) suggested both the household-fixed effect and the biological siblings-fixed effect models might underestimate the size of the disability gap. Although their methodology remains a correlational method (OLS and probit), they found, in rural Punjab province in Pakistan, children with disabilities had a much lower enrollment rate (66% of children without disabilities). Unlike previous researchers, however, they also illuminated the impact of having a sibling with disabilities on the probability of being in a school among children without disabilities. Having siblings with disabilities negatively impacted school enrollment, and the size of the impact varied with the severity of disability. When the severity of disability was moderate, households were more likely to send their siblings to private schools, and these children were more likely to show better literacy achievement. However, when the severity of disability was severe, their siblings were less likely to go to school, and they demonstrated significantly less learning achievement in both literacy and numeracy.

In light of the results of Singal et al. (2018) and the discussion of Fotso et al. (2018), the size of the disability enrollment gap obtained through the use of the household-fixed effect model

might be inaccurate. The household fixed-effect model considered only the enrollment gap within households, not the enrollment gap between households with and without children and youth with disabilities. In other words, the true magnitude of the disability gap should be as follows:

$$The\ disability\ gap = (Enrollment_{h1d0} - Enrollment_{h1d1}) + (Enrollment_{h0d0} - Enrollment_{h1d0}).$$

H1 was a household containing children with disabilities, and H0 was a household without children with disabilities. D1 was a child with disabilities, and D0 was a child without disabilities. Accordingly, $Enrollment_{h1d0}$ was the enrollment status of children without disabilities in a household with children with disabilities (or having a sibling with disabilities), $Enrollment_{h1d1}$ was the enrollment status of children with disabilities in a household with children with disabilities (themselves), and $Enrollment_{h0d0}$ was the enrollment status of children without disabilities in a household without children with disabilities. A household fixed-effect model could consider only the first parenthesis; the presence of the second parenthesis biased the estimation of the household fixed-effect model.

However, unlike in Pakistan (Singal et al., 2018), in Egypt, siblings with disabilities did not influence the school access of their siblings without disabilities (Fotso et al., 2018). Thus, the presence of the second parenthesis should also depend on the context, including the sociocultural and economic environment. Accordingly, the presence and the size of the second parenthesis itself became an interesting research topic.

Social Factors, Disabilities, and Basic School Access

Certain studies examined the associations between disabilities and social factors such as household wealth and gender. Examining the effect of household wealth, Mizunoya et al. (2018) mentioned in the previous section, ran the household-fixed effect model by wealth quintile.

However, the size of the disability enrollment gap did not differ with household wealth in their study, and they, therefore, concluded that, unlike in the case of children without disabilities, the usual poverty reduction interventions (e.g., conditional cash transfer and unconditional cash transfer) were insufficient for this group. Singal et al. (2018) reached the same conclusion using data from Pakistan, although their disability enrollment gap was not causal.

However, El-Saadani and Metwally (2019), as mentioned in the previous section, reached the opposite conclusion. They considered the interaction of the causal impact of disabilities (i.e., on a person ever having attended school) with wealth quintiles. They found that although youth with disabilities from the wealthiest families had better access to education than those from other wealth quintiles, the relationship was not linear. Youth with disabilities from the middle wealth quintile were most often denied access to education. Further, youth with disabilities from rich households also had less access to education than those from the bottom 40%.

Although these studies did not identify the causal impact of disabilities on education, other correlational studies reached the same conclusion as El-Saadani and Metwally (2019). Takeda and Lamichhane (2018) analyzed data from a large household survey in India; they found that disability status does not affect the probability of dropout from primary school because many disabled children never entered school. Further, when children with disabilities entered primary school, their educational attainment and achievement resembled those without disabilities. They also uncovered that the factors influencing the probability of being in school among children without disabilities (e.g., household wealth and parents' educational background) similarly influenced these probabilities among children with disabilities. There was a selection bias in that only children with disabilities who seemed to be able to survive in school might enter school.

However, these results were consistent with the findings of Filmer (2008) that India had a small disability gap. India might be a unique country in the area of education for children with disabilities. Trani and Loeb (2012) analyzed data from a large household survey in Afghanistan and Zambia with a logistic regression model. They found that household wealth influenced the probability of school attendance for children with disabilities. Further, in the case of Afghanistan, being a girl also lowered the probability. Lamichhane and Kawakatsu (2015) published a correlational study analyzing data from a large household survey in Bangladesh. They found that household wealth, the children's fathers' educational background, and the number of working-age family members positively correlated with the probability of being in a school among children with disabilities. Thus, they concluded that affordable education and accessible care were essential, and usual poverty reduction interventions, including conditional cash transfer, could improve the educational status of children with disabilities.

Regarding gender, based on data from eight countries, Luo et al. (2020) found that the size of the disability enrollment gap was almost the same for boys and girls in primary education, regardless of disability type. However, in lower- and upper-secondary education, girls with disabilities had better access to education than did their counterparts who were boys. Singal et al. (2018) arrived at a different result, however. In Pakistan, among children aged 5–16, no gender gap accompanied the disability enrollment gap.

As such, the results reported in the literature were mixed, and it remained unclear whether household wealth and gender mattered for children and youth with disabilities. Perhaps the more important question to explore was under what conditions wealth mattered or did not matter for children with disabilities in relation to their access to school.

Types and Severities of Disabilities and Basic School Access

Children with disabilities had different requirements for reasonable accommodation depending on the types and severities of disabilities. Accordingly, costs for the provision of reasonable accommodation should differ.

Luo et al. (2020) expanded the scope of disability gap research by analyzing census data that adopted the module developed by the Washington Group on Disability Statistics and contained sufficient populations with each type of disability from eight developing countries. They focused on the adjusted net enrollment rate and the completion rate of primary, lower secondary, and upper secondary levels with descriptive statistics. They found that disability in remembering had the most significant negative impact on attendance rate, with the disability enrollment gap reaching 32%, 46%, and 34% in each educational level, respectively. Disability in mobility also had significant impacts (27%, 33%, and 20%), and disabilities in hearing, concentrating, and self-care have moderate impacts, with the gap in primary education being around 15%. Seeing disability had the least impact on school attendance. Although the impact of different types of disabilities differed across countries, it was similar across education levels.

Singal et al. (2018), who analyzed administrative data of the rural Punjab province in Pakistan that covered households with children aged 5–16 with multiple regressions (OLS and probit), reached a different conclusion. Unlike in the study of eight countries, disability in remembering or being understood in this analysis had no impact on school enrollment. Also, disability in seeing had a massive negative impact. Disability in mobility, self-care, or hearing had results similar to those reported by Luo et al. (2020). Similarly, El-Saadani and Metwally (2019) found that in Egypt, disability in seeing had the least impact on school enrollment. Disabilities in remembering and concentrating and communication had a medium-strength effect, and disability

in self-care had the strongest negative impact. As these studies exemplified, the type and severity of disability led to different impacts on school attendance.

Education Policy, School, and Basic School Access Among Children With Disabilities

Qualitative, descriptive, and correlational research disclosed details about how the sociocultural and economic factors surrounding children with disabilities prevented them from accessing school. In the same way that quality of education could, the factors of scholastic and educational policy that prevented them from accessing school could be divided into two aspects: structural and process barriers. Regarding the former, certain studies identified the gap between policy and its implementation. Engelbrecht et al. (2016) employed a case study method in South Africa and found that schools' resources were too limited to implement inclusive education policy appropriately. Mukhopadhyay's rigorous qualitative research in Botswana (2015) indicated that top-down inclusive education policy, influenced by the West, contradicted local knowledge among teachers that made policy implementation inadequate. A lack of barrier-free school facilities and equipment prevented children with disabilities from accessing school. Taneja (2014) conducted an interview study in India and found that although the notion of inclusive education was well-established in a policy document, discrepancies existed in its interpretation among teachers, schools, and policies, preventing the adequate and inclusive implementation of education policy. Other studies pointed out inadequate school facilities and a lack of equipment as supply-side barriers for children with disabilities. Kameyama et al. (2017) conducted a correlational study in Mongolia, concluding that identifying inadequate school facilities and a lack of equipment were perceived challenges among parents and teachers. Lamichhane (2013) employed mixed methods consisting of descriptive statistics and interviews with participants from five major disability organizations in Nepal. The author uncovered that school unavailability and lack of support from

schools were among the main reasons that the children with disabilities had decided to leave school. Among various school resources, one salient issue was the toilet. If children with disabilities could not use a toilet due to a lack of barrier-free toilets, they quickly dropped out of school in rural India (Singal, 2016).

Regarding the process barrier, although certain schools accommodated children with disabilities, their teachers realized that they lacked the competency to welcome children with disabilities into their classrooms (Singal, 2016). Kuroda et al. (2017) examined teachers' perceptions in Cambodia with a correlational method and qualitative method (interview and focus group discussion), concluding that inadequate in-service teacher training and on-site teacher support contributed to the failure to meet the educational demands of children with disabilities. Similarly, Das et al. (2013) examined teachers' perceptions in India with descriptive and correlational (*t*-test) methods. They found that most primary and secondary school teachers believed they lacked the skills to work adequately with children with disabilities. Furthermore, they did not receive any training in this area, nor did they have access to resources for inclusive education. Although supply-side barriers for children with disabilities could be divided into structural and process barriers, as described above, Kameyama et al. (2017) determined that teacher training (process) and equipment and facility provision (structural) must be coordinated. Otherwise, the lack of resources might bar trained teachers from fully utilizing their skills and knowledge, and teachers who did not know how to use a well-resourced teaching environment could easily waste it.

Lamichhane and Tsujimoto (2017) analyzed data from a nationally representative household survey in Uganda and evaluated the impact of the universal primary education (UPE) policy, stipulating fee abolition, on school enrollment of children with and without disabilities by

treating policy introduction as a discontinuity.[3] They found that, unlike in the case of children without disabilities, the UPE policy did not improve access to education among children with disabilities, barring a weak exception for girls with disabilities in nonpoor households.

Lamichhane and Sawada (2013) analyzed data from a large household survey, the Nepal Living Standard Survey, to estimate the rate of return to education for people with disabilities. Their methodology was controversial. They used the age when a person was granted disability status as an instrument for the number of years of education that they received to address selection bias. Apparently, the age when a person became disabled satisfied the exclusion restriction, but the correlation between the age and the years of education was questionable.[4] However, they found a high rate of return to education for people with disabilities (19.3%–25.6%).

These two studies seemed to analyze different things, but their findings had commonalities. Even though cost reduction raised the rate of return to education, most children with disabilities remained out of school. In other words, the usual education interventions, such as fee abolition and scholarship, which increased the rate of return to education, were insufficient for children with disabilities. This group required unusual education interventions to access school.

The discussed studies found teachers' knowledge and attitude and the school's infrastructure to be key challenges in realizing inclusive education. Further, even if a government introduced an inclusive education policy, it might not be appropriately implemented. Simultaneously, as Filmer (2008) and Mizunoya et al. (2018) stated, most children with disabilities never entered school. However, these studies focused on reasons for dropout or perceived barriers for children with

[3] As they acknowledged, a high proportion of delayed entrance to primary school weakened the validity of this methodology.

[4] Specifically, this IV seemed to simply estimate the value of education people with disability had received before they became disabled. Thus, their methodology did not apply in the case of children who were born with disabilities or children who became the disabled before primary school age. Further, as Mizunoya et al. (2018) pointed out, most out-of-school children with disabilities never enter primary school. Thus, even if the internal validity of this method is sound, its external validity seems limited.

disabilities who were enrolled; they did not address supply-side barriers that made parents hesitate to send their children with disabilities to school. Thus, it remained unclear what supply-side interventions enabled children with disabilities to enter primary school.

Children With Disabilities and the Growth of Private Schools

The flagship report in international cooperation in education, namely the Global Education Monitoring Report, analyzed nonstate actors in education in 2021/22 and inclusion in 2020. Although attention to the influence of the growth of private schools on the schooling and learning of children with disabilities was scarce, studies in high-income countries shed light on this topic. Burgess et al. (2015), analyzing household survey data in the United Kingdom, found that wealthier parents tended to avoid schools whose students had a high percentage of children with disabilities. Furthermore, Dudley-Marling and Baker (2012) uncovered that charter schools in the United States tended to have a lower percentage of children with disabilities or accept only children with minor or moderate disabilities, not severe disabilities. In short, because of the growth of private schools, both many parents and many schools tended to avoid learning contexts with children with disabilities. However, such hesitation to include children with disabilities might be mitigated by a government education policy. Bergman and McFarlin (2018) implemented a randomized controlled trial (RCT) and found that charter schools in the United Stated were less likely to respond to admissions inquiries for children with disabilities than traditional public schools. Charter schools thus avoided accommodating children with disabilities. Notably, this behavior was not exhibited by charter schools in those states whose state government fully reimbursed the education costs of children with disabilities.

These studies implied that children with disabilities in LMICs might have less access to private education for the following two reasons: First, the parents of children without disabilities

might hesitate to send their children to schools that accommodated children with disabilities. Second, private schools might hesitate to accommodate children with disabilities, especially those who needed to receive reasonable but expensive accommodation.

A Brief Review of Marginalization Factors and Institutional Educational Access by Level and Learning in LMICs

In this section, the social factors that hinder children's access to institutional education and learning are briefly reviewed. Specifically, this section reviews how gender, urban-rural differences, and household wealth prevent children from accessing school and learning. This review aims to consider whether social factors affect the association between children with disabilities and institutional access to education and learning. I choose these three factors because of their salience in the literature as correlates of institutional educational access and learning. Existing studies support my understanding of the results of the regression analysis.

Gender

In terms of access to education, gender became a less conspicuous marginalization factor, although it was among the most salient marginalization factors before the MDGs. Table 1 displayed the gender parity index (GPI) by education level and countries' income levels. In terms of access to early childhood education, girls were slightly disadvantaged in lower-middle-income countries and South Asia. In primary school access, girls were slightly disadvantaged in low-income countries and Sub-Saharan Africa but slightly better in South Asia. At the secondary school level, girls were disadvantaged in low-income countries and Sub-Saharan Africa. Table 2 displayed the results of international tests about which group of gender performed better, boys or girls. In learning skill acquisition, based on the Southern and Eastern Africa Consortium for

Monitoring Educational Quality (SACMEQ)[5] and the Programme d'Analyse des Systemes Educatifs de la CONFEMEN (PASEC),[6] girls tended to perform better in reading, and boys tended to perform better in mathematics. Gender gaps in access to institutional education and learning skill acquisition were much smaller than gaps caused by other factors, such as rural/urban differences and household wealth.

Table 1
Gender parity Index (GPI) by Education Level Across Certain Income Groups and Regions

	Preprimary	Primary	Secondary
Low income	1.00	0.94	0.84
Lower-middle income	0.96	1.03	1.00
Upper-middle income	1.00	1.00	1.02
Sub-Saharan Africa	1.00	0.96	0.88
South Asia	0.93	1.08	1.00

Source: World Bank (2020)

Table 2
Results of International Examination by Gender in LMICs

	Mathematics			Reading		
	Boys perform better	No significant difference	Girls perform better	Boys perform better	No significant difference	Girls perform better
SACMEQ	7	5	1	2	5	6
PASEC	5	4	1	1	7	2

Source: Calculation made by the author based on SACMEQ and PASEC data

However, gender became a salient marginalization factor when girls faced other marginalization factors. For instance, wealth was a more influential factor for institutional

[5] In 1992, ministers of education in Southern and Eastern African countries and UNESCO International Institute for Educational Planning (IIEP) agreed to establish SACMEQ to undertake integrated research and training activities that will expand opportunities for educational planners and researchers.
[6] In 1991, Conférence des ministres de l'Education des Etats et gouvernements de la Francophonie (CONFEMEN) established PASEC to monitor and provide information on education system performance in Francophone countries for better education policy development.

educational access than was gender. In fact, girls from the wealthiest households tended to have better educational access and completion than boys from the poorest households. However, among children from the poorest households, girls were more disadvantaged than were boys. The same applied to girls in rural areas and girls who spoke minority languages (King & Winthrop, 2015).

Various factors put girls at a greater disadvantage than boys in institutional educational access, and King and Winthrop (2015) provided a framework for understanding why girls were at a disadvantage. They listed the following factors affecting education using a model of demand for education recognizing that the demand for girls' and boys' education was distinct and might be affected differently by a host of factors: household wealth or income, parents' education, presence of parents in the household, age of the child, household composition, the price or cost of schooling, ethnicity or language spoken at home, urban/rural residence, the characteristics of teachers and the school, and the perceived returns for the schooling.

First of all, girls faced higher opportunity costs for schooling due to their frequent employment in domestic work. In the case of children aged below 14 in Guinea, girls suffered greater "time poverty" than boys, mainly because of heavy domestic (unpaid) work (Bardasi & Wodon, 2010). Accordingly, higher school fees led to school dropouts primarily among girls but not boys (Kenya – Lloyd et al., 2000; Rural Pakistan – Lloyd et al., 2007). Diverse papers reporting research in various countries (i.e., Lavy, 1996) found that a long commute to school, or longer abandoned time, negatively affected schooling among girls, but not boys. Under such circumstances, school fee abolition should be accompanied by other education interventions to mitigate the high opportunity cost for girls.

Second, girls faced low expectations for education caused by a social norm that also increased education costs among girls. For instance, in a society in which girls' contact with boys

in a classroom was considered a threat to their honor, single-sex classrooms with female teachers, boundary walls, and separate latrines in schools became essential, and fee abolition might not be adequate to improve female school participation (King & Winthrop, 2015). Additionally, gender inequality in income negatively impacted girls' education. Qian (2008) utilized a unique event in China and found that gender inequality in income lowers educational attainment among girls. In other words, if a society faced significant gender inequality, this situation also negatively led to lower educational attainment among girls, resulting in a vicious circle.

Third, early marriage and teenage pregnancy deprived girls of access to education. Although rates of child marriage steadily decreased, they remained high in LMICs. In particular, the percentage of young women who were married before age 18 was high in Sub-Saharan Africa (35%) and South Asia (30%) (UNICEF, 2020). The same was true for teenage pregnancy. Adolescent fertility rates (births per 1000 women aged 15–19) in low-income countries and Sub-Saharan Africa remained at 94 and 101, respectively. A poor education system invited early marriage and pregnancy. At the same time, early marriage and teenage pregnancy led to poor educational attainment among girls. Field and Ambrus (2008) revealed that, in rural Bangladesh, each additional year that marriage was delayed was associated with 0.22 additional years of schooling and 5.6% higher literacy. However, Grant (2015) found that the simple expansion of access to education might not bring such an impact. The author analyzed the impact of fee abolition policies for primary education and policies promoting the expansion of secondary education in Malawi on the median age at first birth, finding that these policies did not delay that age. The author pointed out that expanding educational opportunities without improving educational quality might be the reason for this phenomenon.

The last element was school-related gender-based violence (SRGBV). The most extreme cases of SRGBV tended to occur in situations of armed conflict, but it was also prevalent in non-conflict situations. For instance, in South Africa, the DHS survey found that 1.6% of females experienced rape at school, and the most common perpetrators were male teachers (Jewkes et al., 2002). A different study in South Africa found a higher rate of women being raped at school, with about a third of women having experienced sexual harassment at school (Prinsloo, 2006). Similar figures could be found even in other parts of the world (e.g., Israel, according to Zeira et al., 2002).

Various qualitative papers (e.g., Bisika et al., 2009) established that SRGBV negatively impacted school attainment and learning among girls. Yet, it remained difficult to disentangle the impact of SRGBV because it did not occur randomly. Further, reverse causality was likely (i.e., children who attended a poor school where the morale of male teachers was low experienced SRGBV more often), and bias might exist that made a direction of the coefficient opposite (i.e., children who regularly attended school should face more risk of SRGBV compared to children who did not regularly attend school). In fact, Psaki et al. (2017) analyzed the case of rural Malawi using a logit model, returning mixed results. A future study might use new policy interventions (e.g., those that strengthen punishment for SRGBV and SRGBV monitoring systems) to estimate the impact of SRGBV on access to education and learning.

Today, in some parts of the world, boys' educational struggles received more attention than did the education issues affecting girls (e.g., low college enrollment among males in high-income countries and early dropout among boys in Latin America and the Caribbean). However, in LMICs in South Asia and Sub-Saharan Africa, on which this study focused, girls were variously disadvantaged. Due to the convoluted nature of the problem, it could not be fully resolved with only a single intervention (e.g., school fee abolition or conditional cash transfer for girls).

Location of Residence

On average, children in urban areas had better access to education. However, their situation was not homogenous. The gap in access to education between the wealthiest children and the poorest children was tremendous. Further, the poorest urban children had less access to education than did the poorest rural children (UNICEF, 2012). Thus, although urban residence might benefit some children, once it interacted with other marginalization factors (e.g., wealth and ethnicity), it could become a marginalization factor in its own right.

UNICEF (2012) identified four challenges for children in urban areas. The first challenge was migration, which affected children directly and indirectly. As a direct impact of migration, children must face a process of assimilation to their new environment. Certain types of schools were adequate for assimilation, but others were not. Children in the latter type of school faced mental problems and academic failure (Lu & Zhou, 2013). Liu et al. (2015) also found evidence of such a heterogeneous impact of migration. Only migrant children from poor households faced this malicious assimilation process. As an indirect impact of migration, the influx of migrants caused problems in urban schools. These schools must accommodate children with various cultural backgrounds who also had different mother tongues. Further, schools lacked sufficient resources, and classrooms became overcrowded (Akar, 2010).

Economic shocks led to the second challenge of urban schools. Although the urban population steadily grew globally, job growth did not keep pace with the increasing urban population. The lack of job opportunities in urban areas was salient among LMICs, and urban youth in these countries faced more severe challenges finding job opportunities than did adults. As Table 3 indicated, the unemployment rate was highest among urban youth in lower-middle-income countries, such as Bangladesh, Ghana, and Pakistan, in all categories.

Table 3
The Global Unemployment Rate for Youth and Adults in Percentage

	Youth (15–24)			Adult (25+)		
	Total	Urban	Rural	Total	Urban	Rural
Low-income	6.4	14.2	3.8	3.0	5.8	1.8
Lower-middle income	16.5	20.4	14.2	3.2	4.7	2.2
Upper-middle income	15.2	17.6	10.9	5.0	5.7	3.7
High income	11.1	11.4	10.1	4.1	4.3	3.4
World	13.7	16.9	10.8	4.1	5.1	2.7

Source: ILO (2020)

The monetary economy in urban areas was also a challenge for children in poor households. Urban poor households spent about 50%–80% of their income on food alone (De Pee et al., 2010) and had to spend what little remained on utilities, housing, and health. Accordingly, volatility in food prices and the economy made poor urban households more vulnerable, and their vulnerability influenced their children's education. In poor urban areas and informal settlements, children of lower-primary school age, particularly girls, transferred from one school to another due to school fees (Maluccio et al., 2018; Oketch et al., 2010).

The third challenge in urban areas was crime and violence, which were prevalent in urban areas. Even in high-income countries, these factors influenced access to education and learning. For instance, in the case of Los Angeles, when police violence against minorities took place near the residences of U.S. high school students, the GPAs, rates of high school completion, and probability of college enrollment among minority students deteriorated (Ang, 2020). Although they did not examine the causal relationship between crime/violence and education outcomes, some studies conducted in LMICs also found such a relationship. In Kingston, Jamaica, community violence was associated with lower achievement in mathematics and reading among students. More intense violence further diminished learning achievement (Baker-Henningham, 2009). Based on interviews and focus group discussions, a study in Nairobi slums found that

children from poor households were disproportionately susceptible to insecurity in the community (the slum) because they could not protect themselves from the many insecurities inherent in their context (Mudege, 2008).

The fourth challenge in urban areas was the effects of disasters due to climate change (e.g., pollution and weather issues). High population density amplified the magnitude of such disasters, particularly in cities with poor infrastructure. Following recent studies found the erosion of learning caused by pollution, which tended to prevail in poor urban areas. Marcotte (2017) used panel data to reveal that various types of air pollution, such as ozone and PM2.5, negatively impacted test scores. Accordingly, if children were exposed to air pollution over a long period, their learning became less productive, such that they accumulated less human capital. In Florida, when children transferred from a school upwind of a highway to a school downwind of the same highway, their exam scores, behavior, and attendance deteriorated compared to the other direction of school transfer (Heissel et al., 2020). Even retrofits of school buses improved the health of children and their achievement in reading and mathematics (Austin et al., 2019). Water pollution resulting in high levels of lead in the blood also deteriorated the reading scores of children in Road Island, U.S.A. (Aizer et al., 2018). Regarding weather issues, climate change caused various problems (e.g., frequent floods and drought), and such weather events deprived children of access to education. Global warming was an especially prevalent concern in urban areas due to the heat-island effect. Goodman et al. (2018) revealed that hotter school days, particularly in extreme heat, deteriorated learning achievement in the United States.

These U.S. studies had significant implications for LMICs. According to the WHO (2016), the countries with the worst air pollution were concentrated in South Asia (i.e., Bangladesh, India, Nepal, and Pakistan), Central Asia (i.e., Turkmenistan, Tajikistan, and Uzbekistan), and the

Middle East. According to further U.S. studies (Austin et al., 2019; Heissel et al., 2020), vehicle emissions were particularly harmful to learning. However, the United Nations Environment Program (UNEP) identified the sale of used vehicles from high-income countries to LMICs as a significant cause of air pollution (UNEP, 2020). In other words, air pollution was an issue today in LMICs. Further, climate change had disproportional impacts on LMICs and on the poor populations who lived there (Abeygunawardena et al., 2009). Accordingly, disaster had a tremendously negative impact on children in urban LMICs.

Despite that urban residence could itself become a marginalizing factor, it could also be a positive factor. First, on average, urban schools had better resources than rural schools, which was true even for inclusive education. In Chile's case, urban schools tended to have more adaptive school equipment and furniture than rural schools, as well as more assistants for children with disabilities, including sign language interpreters (Tamayo et al., 2017). Second, children in urban areas had better access to the education market. In fact, private education providers tended to locate themselves in densely populated and well-resourced places (Chudgar, 2012; Muralidharan & Kremer, 2006; Pal, 2010; Sahoo, 2017). The education market in urban areas provided choices even to poor households. For instance, in Nairobi's informal settlements, once girls reached upper primary school age, they transferred from one school to another to seek better quality schooling, and their transfers resulted in higher learning achievement (Maluccio et al., 2018; Oketch et al., 2010). Accordingly, as long as the household had enough wealth, an urban residence could be an advantage rather than a disadvantage.

In general, urban areas were better than rural ones in terms of access to education and learning. However, urban areas faced unique challenges, and when other marginalization factors entered, such as poverty, gender, and urban residence could also become a marginalization factor.

Household Wealth

Obviously, poverty mattered both for access to education and for learning. However, the history of addressing poverty to improve education was short. Mexico initiated an experiment called *Progresa* in 1997 that provided cash to mothers on the condition that they sent their children to school and health posts. In 2002, this experiment became a nationwide program called *Oportunidades*, and this conditional cash transfer (CCT) scheme expanded to other continents. As of 2014, more than 50 countries implemented CCT (World Bank, 2014).

A systematic review from Baird et al. (2013) found that CCT programs improved access to education. They improved enrollment by an odds ratio of 1:41. When the programs were appropriately implemented with enforcement and monitoring, the size of the impact increased to 1:60. However, their impact on learning was limited; in a meta-analysis, the pooled effect size remained 0.08 standard deviation (S.D). In other words, an increase in household wealth improved access to education, but it did not necessarily ensure learning.

Regarding CCT, researchers should ask which matters more, cash or condition? As condition enforcement and monitoring increased effect size, the condition played an important role. The effect size of unconditional cash transfer was an odds ratio of 1:23, meaning it did not statistically significantly differed from overall CCT but was statistically significantly smaller than well-implemented CCT. The same was true for learning: The effect size of the unconditional cash transfer (UCT) on learning was 0.04, just half that of CCT (Baird et al., 2013). However, this small effect size did not undermine the importance of cash. Biard et al. (2011) implemented a three-arm RCT with CCT, UCT, and a control group in Malawi. They found that the overall effect size of CCT was greater than that of UCT. However, only UCT reduced early marriage and teenage pregnancy. While CCT did not reach dropout girls who

faced a significantly high risk of such behavior, UCT could mitigate the risk by providing cash to such girls.

In short, cash was crucial to improving access to education, particularly among the most vulnerable groups. However, as poor schools could not improve learning, improvement in school enrollment led by an incremental increase in household wealth did not guarantee better learning.

What Are the Expected Relationships Between Gender, Wealth and Location, and Institutional Education Access and Learning for Children With Disabilities?

With respect to gender and disabilities, the direction of the influence of the interaction between gender and disabilities remained unclear. Parents might assign more domestic work to girls with disabilities than to girls without, but disabilities might also prevent them from executing that work effectively. Singal and Jain (2012) found that females with disabilities in India were more included in their society through domestic work than their male counterparts. Further, it was unclear whether girls with disabilities faced a higher risk of early marriage and teenage pregnancy than girls without disabilities. However, it was clear that girls with disabilities were more susceptible to SRGBV. In summary, due to this final element, girls with disabilities would be more marginalized in terms of access to institutional education. However, their learning might not be affected.

Regarding wealth and disabilities, Mizunoya et al. (2018) indicated that household wealth did not affect access to institutional education among children with disabilities. This could be true of both access to institutional education and learning in this study. However, its interaction with the household location would demonstrate the impact of household wealth, as described below.

As other studies (Maluccio et al., 2018; Oketch et al., 2010) uncovered regarding location and disabilities, poor and rich children had different schooling experiences that should also be applied to children with disabilities. Accordingly, poor children with disabilities in urban areas had less access to education and learning even compared to children with disabilities in rural areas. In contrast, rich children with disabilities in urban areas had better access and learning. At the same time, urban areas had the better infrastructure to help children with disabilities. Thus, on average, urban children with disabilities had better access and learning than rural children with disabilities.

Research Questions

The existing literature confirms the negative association between disability and schooling, and most out-of-school children with disabilities never enter school. By extension, this lack of schooling may also translate into lower learning levels. However, the existing literature has yet to explore systematically how socioeconomic and demographic factors (social model) and the type and severity of impairment (medical model) influence these relationships. The existing research also has yet to consider these questions for children in early childhood stages.

My study focuses on the following questions to address these gaps in the literature.

Thus, the research questions of this study are as follows:

1. Regarding the relationship between disability and educational outcomes, through the first set of research questions I document the associations between disability and school attendance and attainment and disability and learning. Specifically, I ask,
    a. What is the association between disabilities and current school attendance?
    b. What is the association between disabilities and having ever attended school?

c. What is the association between disabilities and grade attainment?

d. What is the association between disabilities and private school attendance?

e. What is the association between disabilities and the acquisition of numeracy and reading skills?

f. What is the association between disabilities and the acquisition of numeracy and reading skills, and how does it change after accounting for the schooling levels of children with disabilities?

2. Regarding the social model of disability, through the second set of research questions I document how the household wealth, location and sex of the child moderate the relationship between disability and educational outcomes. Specifically, I ask,

    a. Does household wealth moderate the association between disabilities and education?

    b. Does household location moderate the association between disabilities and education?

    c. Does the sex of the child moderate the association between disabilities and education?

3. Regarding the medical model of disability, through the third set of research questions I document the ways in which the type and severity of disability moderate the relationship between disability and educational outcomes. Specifically, I ask,

    a. Does the type of disability moderate the association between disability and education?

    b. Does the severity of disability moderate the association between disability and education?

4. Through the fourth and final set of questions I investigate the relationship between disability and early childhood education. Specifically, I ask,
    a. What is the association between disability and early childhood education access?
    b. What is the association between disability and early childhood development?
    c. Do socioeconomic and demographic factors influence the associations among preschool children?
        i. Does household wealth moderate the association between disabilities and early childhood education?
        ii. Does household location moderate the association between disabilities and early childhood education?
        iii. Does the sex of the child moderate the association between disabilities and early childhood education?
    d. Do the type and severity of disability influence the associations among preschool children?

Chapter 3. Context of Focus Countries

This study compares Bangladesh, Ghana, and Pakistan (Punjab). In this chapter, I aim to justify my selection of these three countries. In the section below, I discuss the countries' characteristics based on key statistics. I then introduce key education policies for children with disabilities in each country.

Country Backgrounds by Key Statistics

Table 4
Global Unemployment Rate

Indicators	Bangladesh	Ghana	Pakistan
Population, total (thousands)	163,046	30,417	216,565
Population age 0–14 (thousands)	44,371	11,365	75,915
Urban population (% total)	37.4	56.7	36.9
Population density (people per km² land area)	1240	131	275
GDP per capita (current US$)	1,856	2,202	1,285
Gini coefficient	32.5	43.5	33.5
Poverty headcount ratio at $1.90/day (2011 PPP) (% of population)	14.5	13.0	4.0
Gross enrollment ratio, preprimary (%)	40.8	114.5	83.1
Gross enrollment ratio, GPI, preprimary	1.04	1.02	0.87
Gross enrollment ratio, primary (%)	116.5	104.8	94.3
Gross enrollment ratio, GPI, primary	1.07	1.01	0.84
Gross enrollment ratio, lower secondary (%)	92.0	85.4	53.6
Gross enrollment ratio, GPI, lower secondary	1.28	1.02	0.86
Gross enrollment ratio, upper secondary (%)	58.6	47.9	34.1
Gross enrollment ratio, GPI, upper secondary	1.04	0.96	0.84
Primary school age	6–10	6–11	5–9
Secondary school age	11–17	12–17	10–16

Source: World Bank (2020)

Bangladesh and Pakistan are South Asian countries with vast populations of over 150 million. They also share a primary religion, Islam. Although both countries have experienced urbanization, only slightly more than one third of the population lives in urban areas. Although Ghana is a West African country whose neighbors are Francophone countries, it is Anglophone.

More than 70% of its population is Christian, while more than one sixth of the population is Muslim. All three are very young countries in terms of population composition. More than one third of the population in Ghana and Pakistan is below age 14, and one fourth in Bangladesh. Further, based on the World Bank criteria all are lower-middle-income countries.

Bangladesh is by far the most densely populated country in the world, with its population density more than twice as high as the second-most densely populated country (Lebanon). Its poverty and equity situations are similar to those of the average of lower-middle-income countries. In terms of access to institutional basic education access, Bangladesh is the most advanced country of the three. More than half of children of upper secondary school age are still in the education system. However, less than half of children have access to preprimary education.

Ghana is the most urbanized and unequal country among the three, although its poverty level is similar to that of Bangladesh. Educationally speaking, Ghana is slightly behind Bangladesh, but almost half of its concerned population can access upper secondary education. Its preprimary education coverage is much better than that of the other two countries.

Among the three countries, girls are most marginalized in Pakistan. Pakistan's GPI in primary education makes it the third-worst in the world.[7] Although it is the poorest country among the three in terms of GDP per capita, its percentage of people below the poverty line is also the lowest. Educationally speaking. However, Pakistan is the worst of the three. Gross access to primary education remains less than 100%, and only slightly more than one-third of the concerned population can advance to upper secondary schools.

[7] Afghanistan 0.67, Chad 0.78, Pakistan 0.86, and Eritrea 0.86. The rest of countries all over the world show at least 0.9 in GPI primary.

Bangladesh: Key Education Policies for Children With Disabilities

In 1990, the Ministry of Primary and Mass Education (MoPME) issued the Primary Education (Compulsory) Act. Although this act aimed to realize universal primary education, it was far from instituting inclusive education. In fact, it was even far from instituting special or integrated education. Its item 3.3.e stated guardians were exempted from the obligation to send their children to primary school when "the decision of a primary education officer that it is not desirable to enter a child in a primary education institute on account of it's being mentally retarded" (MoPME, 1990, p. 2).

Although the cause is not directly related to education ministries, 2001 was a remarkable year for children with disabilities. The Ministry of Social Welfare in Bangladesh issued the Persons with Disability Welfare Act. This act underscored special education, although not inclusive education. Part D, devoted to education, articulates the following goals:

1. To encourage establishment of Specialised Education Institutions to cater to the special needs of the special categories of children with disabilities, to design and develop specialized curriculum and write special textbooks and to introduce a special examination system, if situations so demand.
2. Create opportunities for free education to all children with disabilities below 18 years of age and provide them books and equipment free of cost or at low cost.
3. Endeavour to create opportunities for integration of students with disabilities in the usual class-set-up of regular normal schools wherever possible.
4. Undertake programs for imparting vocational training for the disabled.
5. Arrange trainings for the teachers and other employees working with the disabled.

6. To incorporate/include appropriate articles and other related subjects in the introductory social science subjects aiming to create public awareness about the lifestyle and associated problems faced by the persons with disabilities.
7. To arrange easy transport facilities for up-down journey to school for students with disabilities.

Ministry of Social Welfare (2001). P. 11–12

The insufficient attention to children with disabilities continued, especially with respect to inclusive education. In 2003, the Education for All: National Plan of Action was created. Although the publication was 71 pages long, children with disabilities were hardly mentioned (MoPME, 2003). In 2004, the Second Primary Education Development Program was issued, and it briefly mentioned them, proposing to "expand capacity for special needs education" (p. 2) and to promote "special needs education to overcome all the barriers that prevent children from accessing and completing school" (p. 6). The program did not include any concrete strategy for overcoming these barriers, however, and the infrastructure section did not even mention special needs education (MoPME, 2004).

In 2010, the *National Education Policy 2010* was published. However, the insufficient attention to children with disabilities persisted. The policy consisted of 28 sections, one of which described policy for special education. However, the section was not devoted solely to special education, but rather consisted of special education, health and physical education, scouts, girl guides, and bratachari. Further, the language of inclusion was used in its aims: "Steps will be taken to include the handicapped in the mainstream education" (p. 43). Its strategies remained linked to the medical model of disability, and integrated education was the main scope, with scant support

offered: “Under the integrated education program, at least one teacher of each school will be trained properly to instruct the challenged children” (MoPME, 2010, p. 43).

However, the situation has changed recently. In 2018, the fourth Primary Education Development Program was issued. It aimed to create “an efficient, inclusive, and equitable primary education system delivering effective and relevant child-friendly learning to all Bangladesh’s children from preprimary to grade 5” (MoPME, 2018, p. 11); such a program clearly embarked on the realization of inclusive education. Its school infrastructure plan also aimed to equip schools with infrastructure and furniture suitable for children with disabilities.

Pakistan and Punjab: Key Education Policies for Children With Disabilities

Hussain (2012) described the environment of children with disabilities in Pakistan as “harsh.” Children with disabilities are perceived to be God’s punishment for a parent’s sin, and social attitudes toward them and their families attribute shame, humiliation, or disgrace. Parents and communities consider children with disabilities to be incapable or unworthy of any education, and they are seen as better off at home than at school.

In 1998, Education Policy 1998–2010 was issued by the Ministry of Federal Education and Professional Training (MoFEPT). However, the policy did not mention children with disabilities or special education (MoFEPT, 1998). The situation remained the same even in the Education Sector Reforms Action Plan 2001/02–2005/06 (MoFEPT, 2001), National Education Policy 2009 (MoFEPT, 2009), and National Plan of Action to Accelerate Education-Related MDGs 2013–16 (MoFEPT, 2013). Further, the Right to Free and Compulsory Education Act 2012 even stated that parents were exempted from the obligation to send their children to school when the School Management Committee was satisfied that the child was incapable of attending school by reason of any infirmity or mental incapacity (MoFEPT, 2012, p. 5).

The education plan totally dismissed children with disabilities because special education was managed by another ministry, the Ministry of Social Welfare and Special Education (MSWSE). MSWSE intended to pursue both special education and inclusive education from a relatively early time. This intention was already expressed in a 2006 document, the National Plan of Action 2006 to Implement the National Policy for Persons with Disabilities. Its Action 5 proposed the "strengthening of special education for children with severe and moderately severe disabilities" (p. 5). Action 6 aimed at "promoting inclusive education for children with moderate and mild disabilities" (MSWSE, 2006, p. 5). The MSWSE was in charge of the provision of special education centers and, thus, for special education for children with moderate to severe disabilities only. Action 6, promoting inclusive education, remained the responsibility of the Ministry of Education. However, as discussed, the plans and policies of the education ministry did not consider children with disabilities, and it took more than a decade for the education ministry to pay attention to children with disabilities.

In 2017, the National Education Policy 2017–2025 was issued. Citing the WHO (2011), the policy's Chapter 15 ("Special and Inclusive Education") discussed both the social and medical models of disability. In addition, as one of the policy-level issues, it admitted that ministerial fragmentation restricted the response of education departments to the educational needs of children with disabilities. Accordingly, its goal reflected the social model of disability: "Ensuring inclusive and equitable access of all children to all levels of education, including technical and vocational training" (p. 119), although its targets remained unrealistic: "Increase participation rate of disabled children from existing 5%–100% by 2025" (p. 119) and "Creating inclusive learning environment in 50% of formal schools, colleges, and universities to facilitate enrolment, retention, and completion of education by the children with disabilities" (MoFEPT, 2017, p. 119).

So far, MICS6 collects data only for Punjab within Pakistan. Punjab is the largest province in Pakistan, with a population of more than 110 million. Since Pakistan uses a federal system, the government of Punjab is strong compared with typical provinces in LMICs. In 2014, the government of Punjab issued the Punjab Free and Compulsory Education Act 2014, which attended to children with disabilities but adopted the medical model of disability and special education. Its Article 2.d defined education as "teaching and training of mind and character by attendance in regular school education, madrassa education, vocational training and special education in the classroom and school setting, or nonformal education or the education prescribed for a child or category of children by the Government" (p. 1). Further, its Article 3. (4) stated, "The Government shall, in the prescribed manner, provide or cause to be provided suitable education to a child suffering from disability or a special child" (Government of the Punjab, 2014, p. 2).

However, the Punjab School Education Sector Plan 2013–2017 explicitly appreciated the social model of disability and inclusive education, stating that "At present a bifurcation of schools between 'special' and regular schools exists. More children need to be included into regular systems and exclusion must be reduced as far as possible" (Government of Punjab, 2013, p. 48). At the same time, its appreciation derived from a pragmatic reason, and this would be the reason why there was an incongruence between the Act of 2014 and Plan of 2013: "While the costs of setting up special institutions everywhere would be too high, the alternative is to make the regular school system more 'inclusive' and hereby increasing tolerance and integration of special needs children" (Government of Punjab, 2013, p. 78).

Punjab Education Sector Plan 2019/20–2023/24 appreciated inclusive education more than previous policies and plans did, paying attention to enabling environments to realize inclusive education in its Strategic Area 2 Specific Objective 3.3: "Establish an enabling environment for

children with special needs in mainstream schools and institutions" (Government of Punjab, 2019, p. 78).

Ghana: Key Education Policies for Children With Disabilities

In 2003, the Ministry of Education published *the Education Strategic Plan 2003 to 2015*, which gave explicit regard to children with disabilities. For instance, although the targets were unrealistic, it set target values for school enrollment of children with disabilities. Its EA9 indicative target sought to "increase attendance of those with special education needs in schools to 50% in 2008, 80% in 2012 and 100% by 2015" (Ministry of Education Ghana, 2003, p. 8). In addition, the plan aimed to provide materials and teacher training for children with disabilities. It lacked a detailed and concrete strategy to ensure institutional education access for children with disabilities, though. Further, despite that it mentioned an inclusive education system, the plan relied on special education and integrated education, not inclusive education, to provide education for children with disabilities. Its EA7 target aimed to "integrate all children with nonsevere special education needs in mainstream schools by 2015" (Ministry of Education Ghana, 2003, p. 8).

However, the ministry constructed a detailed and concrete plan for children with disabilities in the next education plan. In 2012, the ministry published the Education Strategic Plan 2010 to 2020, and it listed the following strategies to realize inclusive education:

a) Create and sustain public awareness on disability issues and special educational needs.

b) Determine the prevalence rates of various disabilities and special educational needs.

c) Conduct early comprehensive assessments of all learners experiencing educational difficulties for appropriate mainstream and special placement and intervention.

d) Increase equitable access to high quality educational opportunities in mainstream pre-tertiary and tertiary institutions for those with disabilities and special needs.

e) Provide for and safeguard the rights of learners and young people with disabilities

f) Increase enrolment of girls with disabilities at the pretertiary levels.

g) Ensure that those with disabilities/special needs acquire appropriate technical and vocational skills for full community integration.

h) Strengthen and improve Special Educational planning and management.

i) Promote the development of Information and Communication Technology (ICT)-based solutions to enhance the educational opportunities of learners and young people with disabilities and special needs.

(Ministry of Education Ghana, 2012, p. 17)

In addition, the plan contained various targets to realize inclusive education, as follows:

Socio-Economic Strategy

IS1. Include disadvantaged children within the existing education system or provide special facilities for them.

IS2. Include all children with nonsevere physical and mental disabilities within mainstream institutions.

IS3. Provide special schools or education units or for those severely disabled.

IS4. Provide transport and/or guides to nonboarding special schools and units (SSUs) for students who live more than 5 km and less than 15 km from school.

IS5. Motivate seriously disadvantaged children (severely disabled, orphans, street children, etc.) and their parents to attend mainstream or special schools.

IS6. Ensure that health, sanitation and safety systems are applied in SSUs (as well as mainstream schools).

Educational Strategy

IS7. Ensure that SSUs, and their pupils, have access to appropriate teaching/learning materials (including ICT).

IS8. Equip school and public libraries with special facilities for the development of those who are severely disadvantaged.

IS9. Ensure that the curricula of SSU are relevant to personal development.

IS10. Ensure that SSUs completers have appropriate life skills including job-market training for the severely disabled.

Economic Strategy

IS11. Establish School Management Committees (SMCs) and introduce capitation grants to improve local management of SSUs.

IS12. Ensure that SSU teachers provide value for money in terms of pupil contact time and effective learning.

IS13. Develop an open mutual-accountability scheme for parents, SSUs, teachers and districts (likewise, DEO, REOs, GES).

(Ministry of Education Ghana, 2012, p. 26)

Further, in 2015, the ministry published the Inclusive Education Policy, which underscored inclusive education and articulated four policy objectives, monitoring and evaluation framework, and the role of various stakeholders, such as national education stakeholders, NGOs, development partners, and the private sector (Ministry of Education Ghana, 2015).

Table 5
Summary Table of Country Characteristics

	Bangladesh	Pakistan	Ghana
Common Characteristics			
Economy	Lower-middle	Lower-middle	Lower-middle
Current policy	Inclusive	Inclusive	Inclusive
Differences			
Religion	Muslim	Muslim	Christian
Urbanization	Low	Low (national) High (Punjab)	High
Gender difference in accessing education	Not significant	Significant	Not significant
Timing of shift to policy of inclusiveness	2018	2017 (national) 2013 (Punjab)	2012

Source: Created by author

In summary, these three countries differ in how they address the issue of education for children with disabilities. In Ghana, the education ministry had already paid attention to the issue of disability in the early 2000s, even though its plan was unrealistic. They also began to consider inclusive education, even before 2015. However, the engagement of the Punjabi education ministry with disabilities is short because of the strong presence of the welfare ministry in this area. The education ministry of Bangladesh also has a short history of engagement with disabilities because of the strong presence of the welfare ministry in this area. However, unlike the case of Pakistan, they initiated work on inclusive education after 2015.

Chapter 4. Data and Methods

Data

This study used MICS data that contain the disability module developed by the Washington Group on Disability Statistics. The module for children consisted of two parts: one is for children from ages 2–4, and the other is for those ages 5–17. As of July 2020, data from 22 countries were available. The MICS employed a complex sampling structure for the collection of this data. I explain this structure briefly and discuss how I account for it in the sections below.

From these 22 countries, this study eliminates countries based on the following criteria:[8] small sample size countries, upper-middle-income countries, conflict countries, and countries with extremely limited relevant research literature (I detail these eliminations in Appendix A). These four criteria left three countries: Bangladesh, Ghana, and Pakistan (Punjab).[9] Accordingly, this study focuses on these three countries. These countries are considered in terms of their economic situation, religion, educational development, and education policy for children with disabilities.

A Measure of Schooling/ECE, Learning, and Child Development (Outcome Variables)

In this study, I analyzed both schooling and learning among children with disabilities. Regarding schooling, this study uses the following variables. For preschool children (age 2–4), the indicator is early childhood education programs attendance. In addition, I use the following four indicators for primary and secondary school-age children (age 5–17): current school attendance (regardless of school type), private versus public school attendance, whether the child has ever enrolled, and the child's grade attainment.

[8] Please refer to Annex 1 for details of countries and elimination criteria.
[9] The war criteria apply to Pakistan. However, MICS 2017-18 Pakistan collected data only from Punjab where is far away from conflict zones in Pakistan

Regarding learning, my study applies the following variables. For preschool children, it focused on child development outcomes provided by the MICS. The MICS regards the following aspects of child development and assesses whether children are developmentally on track: literacy and numeracy, physical activity, social and emotional competency, and approaches to learning (Loizillon et al., 2017). The MICS creates an early childhood development index (ECDI) that regards a child as developmentally on track if that child exhibits at least three of the four aspects of child development are developmentally on track. This study follows the ECDI to examine the learning of preschool children.

For primary and secondary school children, I focus on foundational learning skills.[10] These skills divide into two domains: reading and numeracy. Reading comprises three foundational tasks, and numeracy four. Children were assessed as to whether they completed all tasks in each domain. Children who passed in both domains were regarded as having acquired foundational learning skills.

The list of outcome variables is summarized in Table 6 below.

[10] The foundational skills module only assesses children aged 7-14. Accordingly, this part excludes primary and secondary school-age children whose age is either below seven or above 14

Table 6
List of Outcome Variables

Category	Age range	Variables
Schooling	Preschool children (age 2–4)	• Early childhood education program attendance
	Primary and secondary school children (age 5–17)	• School attendance • Having ever attended school • Educational attainment • Private school attendance
Learning	Preschool children (age 2–4)	• Early Childhood Development Index
	Primary and secondary school children (age 7–14)	• Foundational learning skills – numeracy • Foundational learning skills – reading

Source: Listed by the author based on available indicators in MICS

A Measure of Disability (Independent Variables)

A critical independent variable of interest is children with disabilities. The MICS adopts a child functioning module developed by the Washington Group on Disability Statistics. The module divides children into two age groups, 2–4 and 5–17.

For children aged 2–4, the module collects disability information in the following domains: seeing, hearing, walking, fine motor, communication, learning, playing, and controlling behavior. In each domain, children are assessed across the following four levels: no difficulty, some difficulty, a lot of difficulty, and cannot at all. This study follows the UNICEF classification: Children are regarded as having functional difficulty in a domain if they face either "A lot of difficulty" or "Cannot at all." Then, if children have functional difficulty in at least one domain, they are regarded as children with disabilities.

For children aged 5–17, the module collects information in the following domains: seeing, hearing, walking, self-care, communication, learning, remembering, concentrating, accepting

change, controlling behavior, making friends, anxiety, and depression. As with the module for ages 2–4, children are assessed with the four levels in each domain and regarded as having functional difficulty in the same manner. They are regarded as children with disabilities if they have functional difficulty in at least one domain.

To closely examine the implications of the medical model of disability, this research also disaggregates children with disabilities by severity and types. This study regards each severity criteria in the questionnaire as follows: "Some difficulty" in any domain indicates mild disabilities, "A lot of difficulty" in any domain indicates moderate disabilities, and "Cannot at all" in any domain indicates severe disabilities. If a child has functional difficulties in more than one domain and the disability severity is different in two domains, I decide the severity of their disability based on the more severe domain

Regarding disability types, I follow the Washington Group short set on functioning (WG-SS) (https://www.washingtongroup-disability.com/question-sets/wg-short-set-on-functioning-wg-ss/). The WG-SS was developed because, unlike an ideal situation in which all question items can be listed in a questionnaire to collect comprehensive information on disabilities, the number of question items must be restricted in most surveys and censuses. Accordingly, the WG-SS will (a) represent the majority of, but not all, persons with limitations in basic actions, (b) represent the most commonly occurring limitations in basic actions, and (c) be able to capture persons with similar problems across countries. The WG-SS consists of the following six functional domains: seeing, hearing, walking, selfcare, communication, and remembering. Thus, the rest of the following domains can be categorized as others: learning, concentrating, accepting, controlling, making friends, anxiety, and depression. Based on the intention of WG-SS, it is a policy-relevant question whether WG-SS and other types of disability have different associations with schooling

and learning. Therefore, I categorize types of disability into WG-SS, nonWG-SS, and both WG-SS and nonWG-SS (multiple functional difficulties) and examine their associations with schooling and learning.

Disability status interacts with the following socioeconomic and demographic factors in Table 7 to look at the social model of disability closely.

Table 7
List of Variables That Interact With Disabilities

Variable	Definition/measures
Household wealth	A measure of household wealth is the wealth index quintile. The poorest is the reference group of this study, and poor, middle, wealthier, wealthiest are the variables to interact with disabilities.
Household location	A measure of household location follows the government definition. Rural areas is the reference group, and urban areas is the variable to interact with disabilities.
The sex of a child	A reference group is girls, and boys is the variable to interact with disabilities.

Source: Listed by the author based on available MICS indicators

Control Variables

As control variables, this study collects children's demographic information (age and gender) and information on their household, including variables such as household size, number of children in the household, whether a household is headed by an adult other than the father, religion and ethnicity, language minority status, wealth, and caregiver's educational background, as explained in Table 8.

Table 8
List of Control Variables

Variable	Definition/measure
Age & age ^2	Age of the child
Household size	The number of a family member
Number of children aged below *x*	The number of children in the family
Household head	0 = Household is headed by father 1 = Household is headed by an adult other than the father
Religion	The religion of the family
Ethnicity	The ethnicity of the family
Language	0 = Not language minority 1 = Language minority
Region	Region dummy
Household head's educational background	The education level of the household head

Source: Listed by the author based on available MICS indicators

Methods

OLS and Logit Model and the Challenge of Causality

This study mainly uses the logit model[11] and the OLS model to understand the association between schooling/learning and disabilities and examine whether the socioeconomic and demographic factors and the type and severity of disabilities influence the association.

Regression models, such as logit and OLS, that do not address unobservables would face the issue of omitted variables and yield biased estimates. For instance, unobservable local characteristics, including governance quality, might simultaneously influence the availability of schools and hospitals or medical posts. The availability of schooling can be related to the

[11] Given the difficulty of interpreting logit models I considered Linear Probability Model (LPM), which is also used for binary outcome variables. While LPM coefficients are easier to interpret LPM model also has three problems: out-of-bounds predicted probabilities, inappropriate linear significance test due to the violation of homoscedasticity, and inappropriate linear approximation. According to Hellevik (2007), the first problem becomes an issue only if a researcher uses LPM for prediction, which is not the case in this study. Also, he finds that the second problem is almost negligible. According to Long (1997), the third problem does not become an issue if the probability is moderate (i.e., between 0.2 and 0.8). However, while the school attendance/entrance rate in three countries goes beyond 0.8, some FLS acquisition rates go below 0.2. Thus, I decide to use the logit model for this study.

probability of school attendance. At the same time, the availability of hospitals and medical posts might increase the prevalence of disabilities. In such a case, regression analysis may yield a biased estimate of the relationship between disabilities and schooling if it does not address such an unobservable issue.

Previous research (El-Saadani & Metwally, 2019; Filmer, 2008; Fotso et al., 2018; Mizunoya et al., 2018) has addressed the issue of unobservable with the household-fixed effect model. Essentially, the model addresses the challenge of unobservable by comparing children with and without disabilities in the same household. For instance, in the previous example, children with and without disabilities living in the same household will experience the same contextual and unobserved influences.

However, the benefit of the household-fixed effects model also entails challenges. As described, the model reduces the sample size because it discards all children without disabilities who do not have another child with disability in the same household. Given a low prevalence of disabilities, this issue is critical. Further, since the model fixes household characteristics as a constant, it also prevents researchers from including household-related interaction terms, such as wealth and location. Furthermore, the MICS surveyed only one child aged 5–17 per household. Although the MICS module for children under age 5 collects more than one child per household, it collects ECE access and ECDI information only from children aged 3–4. Hence, the household fixed-effects model can be applied only to households with at least two children whose ages are between age 3 and 4 and where one child is disabled and another is not. The number of such households is small, and the applicability of findings from such a unique household sample to the general population is dubitable. A recent study from Cameroon (Fotso et al., 2018) also informed my decision about which empirical approach I may adopt. The study shows that OLS and the

household-fixed effect model exhibit the same results for the impact of being disabled on school attendance. Ultimately, based primarily on the challenges of limited and unrepresentative samples of households I could utilize for the household fixed effects approach, I decided not to rely on this technique. I use this model only for the robustness check of the association between disabilities and access to ECE/child development, not for primary and secondary school age children, due to the sample design discussed above.

Method of Comparing Groups With the Logit Model

Given the challenges of interpreting logit coefficients, I paid close attention to generate meaningful insights from the logit analysis. A key focus of my study is to compare the ways in which the disability–education relationship is moderated by social factors and by the type and severity of disability (medical factors). There are several ways to determine whether socioeconomic and demographic factors or the type and severity modify the associations between disabilities and education. One intuitive way to do so is to run separate regressions by socioeconomic and demographic factors, such as the sex of a child, and then compare the coefficients. For instance, I might run logit regression for boys and girls separately and compare the coefficient of disabilities. However, this method involves difficulties both in interpretation and statistical testing. Regarding the former, the log-odds are complicated to interpret. In addition, even the odds ratio can sometimes be misleading. For instance, citing an example from Long and Mustillo (2021), the odds ratio of boys without and with disabilities in school attendance is assumed to be 2.67 = (0.4/0.6)/(0.2/0.8). Therefore, while only 20% of boys with disabilities attend school and 80% remain out-of-school (the denominator), 40% of boys without disabilities attend school and 60% remain out-of-school (the numerator), resulting in a 2:67 odds ratio for boys with and without disabilities in school attendance. Then, let's assume girls with and without disabilities

display a similar odds ratio, such as 2:64 = (0.026/0.974)/(0.01/0.99). Under this scenario, while only 1% of girls with children with disabilities attend school and 99% remain out-of-school (the denominator), 2.6% of girls without disabilities attend school and 97.4% remain out-of-school (the numerator). In such a case, the odd ratios of boys and girls without and with disabilities are almost the same, but the effect of disabilities differs significantly (0.2 vs. 0.016). Thus, in comparing groups it is preferable to avoid interpreting coefficients directly.

From the perspective of a statistical test, the equality of coefficients test between two groups (i.e., boys vs. girls) with the logit model requires knowing the relative size of the error variances in the two groups, which cannot be obtained. As developed by Allison (1999), this issue can be solved by assuming the coefficient of one of the regressors is equal between two groups. However, the equality of the coefficients test between two groups depends on which regressor is assumed to be equal between two groups, and it sometimes leads to conflicting conclusions. Accordingly, as recommended by Mize (2019), I employ a logit model with interaction terms but rely on marginal effects to interpret the size and significance of the association between educational outcomes and disabilities and utilize the second differences among social constructs (i.e., boys vs. girls, urban vs. rural, and among wealth quantiles) to determine whether an interaction effect is significant. Marginal effect is applied to measure the change in the probability of the outcome when a specific independent variable of interest changes in value. In this study, the marginal effect is the gap in the probability of schooling and learning between children with and without disabilities, in most cases. The second difference uses the Stata lincom command. Firstly, the command employs a two-tail *t*-test to check whether the marginal effect of disabilities differs statistically significantly from zero in a specific construct, for example boys (i.e., whether there is a disability gap for boys). Then, the command employs a two-tail *t*-test again to see whether the

marginal effect of disabilities in a specific construct (i.e., boys) is statistically significantly different from the marginal effect of disabilities in its counterpart construct (i.e., disability gap for girls).

Two Types of the Marginal Effect

However, marginal effects depend on the values of the control variables where the marginal effect is estimated (Long & Freese, 2006). Long and Mustillo (2021) discuss two commonly used approaches to calculate marginal effects. The first approach calculates marginal effects fixing the value of control variables at certain representative values (e.g., the mean). Thus, based on this approach the marginal effects are called the "marginal effects at the mean" (MEM). The second approach calculates marginal effects using value of control variables as observed. Based on this approach, the marginal effects are called the "average marginal effects" (AME). The difference between MEM and AEM can be written as follows:

$MEM = \frac{\partial E[y|x]}{\partial x}$ versus

$$AME = \frac{1}{n}\sum_{i=1}^{N}\frac{\partial[y_i|x_i, w_i]}{\partial x}.$$

As Long and Mustillo (2021) discuss, the choice between two approaches depends on the substantive question being asked, and neither approach is always better; they address how effects differ across groups. I apply AME in this study. MEM provides useful information on the associations between disabilities and education, but in the real world, certain covariates are highly correlated. For example, the educational backgrounds of mothers of poor children tend to be low. In such a case, the MEM does not provide a realistic scenario. This unrealistic scenario might hold even for the case of children with and without disabilities. Further, from the perspective of

education policy, AME assists education stakeholders in deciding the indicators on which to focus to decide focus group of children. Thus, in this study, I use AME to calculate marginal effects.

In summary, I run the OLS and logit model and calculate probabilities to analyze the association between disabilities and various education outcomes. For the analysis of whether socioeconomic and demographic factors moderate the associations between disabilities and education outcomes, I take the following steps: Firstly, I run the logit model with interaction term. Secondary, I calculate the average marginal effect of disabilities for the given education outcome for a specific construct (i.e., boys) and check whether it differs statistically significantly from zero with a two-tailed *t*-test. I then also calculate the AME of disabilities in the given education outcome for the counterpart of the specific construct (i.e., girls) and check whether it differs statistically significantly from zero with a two-tailed *t*-test. Finally, I test whether the AME of disabilities in the given education outcome differ significantly between the two groups with a two-tailed *t*-test.

Models

I use the following set of models to answer research questions. I use OLS for the school grade attainment and the logit model for the following dependent variables: school attendance, never attended school (school entrance), private school attendance, FLS numeracy, and FLS reading. I set the numbering of models to be consistent with the numbering of research questions.

$$\Pr(Attendance_i = 1) = \alpha_0 + \alpha_1 Disability_i + \boldsymbol{Other\ controls_i}\ \boldsymbol{\alpha_2} + \epsilon_i \quad (1.a)$$

$$\Pr(Entrance_i = 1) = \beta_0 + \beta_1 Disability_i + \boldsymbol{Other\ controls_i}\ \boldsymbol{\beta_2} + \epsilon_i \quad (1.b)$$

$$Attainment_i = \gamma_0 + \gamma_1 Disability_i + \boldsymbol{Other\ controls_i}\ \boldsymbol{\gamma_2} + \epsilon_i \quad (1.c)$$

$$\Pr(Private_i = 1) = \delta_0 + \delta_1 Disability_i + \boldsymbol{Other\ controls_i}\ \boldsymbol{\delta_2} + \epsilon_i \quad (1.d)$$

$$\Pr(Learning_i = 1) = \theta_0 + \theta_1 Disability_i + \boldsymbol{Other\ controls_i}\ \boldsymbol{\theta_2} + \epsilon_i \quad (1.e)$$

$\Pr(Learning_i = 1) = \theta'_0 + \theta'_1 Disability_i + \theta'_3 Schooling_i + \boldsymbol{Other\ controls_i}\,\boldsymbol{\theta_2'} + \epsilon_i$ (1.e/1.f)

$Attendance_i$ is a dummy variable that take a value of one if a child *i* attends school and zero otherwise. $Entrance_i$ is a dummy variable that take a value of one if a child *i* ever attended school and zero otherwise. $Attainment_i$ is a continuous variable about grade attainment of a child *i*. $Private_i$ is a dummy variable that take a value of one if a child *i* attends private school and zero otherwise. $Learning_i$ is a dummy variable that take a value of one if a child *i* acquires the foundational learning skill in numeracy/reading and zero otherwise. $Disability_i$ is a dummy variable that takes a value of one if a child *i* is a child with disabilities and zero if the child is a child without disabilities. $\boldsymbol{Other\ controls_i}$ represents a vector of household characteristics and the home learning environment that are described in the table above. The error term ϵ_i indicates random fluctuation in schooling and learning of children, while $\alpha_1 - \theta_1$ capture the associations between disabilities and schooling and learning in both models. $Schooling$ is a set of schooling variables, school attendance, school attainment, and private school attendance. The comparison between θ_1 and θ'_1 indicates whether a portion of the association between disabilities and learning comes from the gap in schooling between children with and without disabilities.

I run the following regressions to see whether household wealth (2.a), household location (2.b), and the sex of a child (2.c) influence the associations between disabilities and education:

$$\Pr(Y_i = 1) = \mu_0 + \mu_1 Disability_i + \mu_2 Disability_i * Poor_i + \pi_3 Disability_i * Middle_i + \mu_4 Disability_i * Rich_i + \mu_5 Disability_i * Richest_i + \mu_6 girl_i + \mu_7 Rural_i + \mu_8 Poor_i + \mu_9 Middle_i + \mu_{10} Rich_i + \mu_{11} Richest_i + \boldsymbol{Other\ controls_i}\,\boldsymbol{\tau_{12}} + \epsilon_i, \quad (2.a)$$

where Y_i is a set of outcome variables about schooling and learning, namely $Attendance_i$, $Entrance_i$, $Attainment_i$, $Private_i$, and $Learning_i$, and where $Poor_i$ is a dummy variable that indicates whether a household of the child is a poor household. The classification of household

wealth is based on the wealth index as follows: percentiles 0–20 indicate poorest, percentiles 20–40 percentile indicate poor, percentiles 40–60 indicate middle, percentiles 60–80 indicate rich, and percentiles 80–100 indicate richest. The reference group is the poorest household. I am interested in μ_2–μ_5. If one of them differs significantly from zero, and some household wealth influences the associations between disabilities and education.

$$\Pr(Y_i = 1) = \omega_0 + \omega_1 Disability_i + \omega_2 Disability_i * Rural_i + \omega_3 girl_i + \omega_4 Rural_i + \omega_5 poor_i + \omega_6 middle_i + \omega_7 rich_i + \omega_8 richest_i + \boldsymbol{Other\ controls_i\ \tau_9} + \epsilon_i \quad (2.b)$$

In this equation, the coefficient of interest is ω_2. If it differs significantly from zero, the household location influences the associations between disabilities and education.

$$\Pr(Y_i = 1) = \theta_0 + \theta_1 Disability_i + \theta_2 Disability_i * girl_i + \theta_3 girl_i + \theta_4 Rural_i + \theta_5 Poor_i + \theta_6 Middle_i + \theta_7 Rich_i + \theta_8 Richest_i + \boldsymbol{Other\ controls_i\ \tau_9} + \epsilon_i \quad (2.c)$$

In this equation, the coefficient of interest is θ_2. If it differs significantly from zero, the sex of a child influences the associations between disabilities and education.

Finally, I examine whether the associations between disabilities and education differ by the type and severity of disability.

$$\Pr(Y_i = 1) = \rho_0 + \rho_1 WG - SS_i + \rho_2 Non - WG - SS_i + \rho_3 having\ both\ types\ of\ disabilities_i + \rho_4 girl_i + \rho_5 Rural_i + \rho_6 Poor_i + \rho_7 Middle_i + \rho_8 Rich_i + \rho_9 Richest_i + \boldsymbol{Other\ controls_i\ \tau_{10}} + \varepsilon_i \quad (3.a)$$

In the equation above, the coefficients of interest are ρ_1–ρ_3. If they differ, the associations between disabilities and education differ by disability type.

$$\Pr(Y_i = 1) = \delta_0 + +\delta_1 mild\ disability_i + \delta_2 moderate\ disability_i + \delta_3 severe\ disability_i + \delta_4 girl_i + \delta_5 Rural_i + \delta_6 Poor_i + \delta_7 Middle_i + \delta_8 Rich_i + \delta_9 Richest_i + \boldsymbol{Other\ controls_i\ \tau_{10}} + \varepsilon_i \quad (3.b)$$

In Equation 3.b, the coefficients of interest are $\delta_1 - \delta_3$. If they differ, the associations between disabilities and education differ by disability severity.

In sum, I analyze 150 regressions for each of the three countries (see Table 9).

Table 9
Summary of Research Questions and Regressions

Equations	Number of regressions
1.a The association between disabilities and school current attendance (Logit)	3
1.b The association between disabilities and ever attending school (Logit)	3
1.c The association between disabilities and grade attainment (OLS)	3
1.d The association between disabilities and private school attendance (Logit)	3
1.e The association between disabilities and numeracy and reading skills acquisition (Logit)	6
1.f Change in 1.e after accounting for schooling levels of children with disabilities (Logit)	6
2.a Household wealth and the associations (Logit and OLS)	18
2.b Household location and the associations (Logit and OLS)	18
2.c Sex of a child and the associations (Logit and OLS)	18
3.a Type of disabilities (Logit and OLS)	18
3.b Severity of disabilities (Logit and OLS)	18
4.a The association between disabilities and early childhood education access (Logit)	3
4.b The association between disabilities and early childhood development (Logit)	3
4.c Socioeconomic and demographic factors and the associations (Logit)	18
4.d Type and severity of disabilities and the associations (Logit)	12
Total	150

Source: Listed by author

For the entire analysis, I use the Stata SVY command to incorporate the survey design of the MICS with probability weights. More specifically, I used the following code in the case of children aged 5–17 and replaced the sampling weight from fsweight to chweight in the case of children aged 2–4: svyset PSU [pweight = fsweight], strata(stratum). Regarding standard errors, The MICS collects and provides representative data at the district level. In each district, the MICS

stratifies urban and rural areas and assigns primary sampling units (PSUs) to reflect the proportion of households. In all three countries, the enumeration areas (EAs) are used as PSUs, and 20 households are sampled from each EA. Accordingly, the SVY command clusters standard errors at EA level. Regarding sampling weights, the major component of the weight is the reciprocal of the sampling fraction employed in selecting the number of sample households in that particular sampling stratum and PSU. Accordingly, children aged 2–4 and aged 5–17 modules assign a different sampling weight to each child. In the MICS, the variables chweight and fsweight assign a sampling weight to each category of child, respectively.

Chapter 5. Associations Between Disabilities and Schooling/Learning

This chapter analyzes the associations between disabilities and schooling/learning. Firstly, I provide descriptive statistics on the independent variable (prevalence of disabilities), dependent variables (status of schooling and learning), and control variables. Then, I run the logit model to see the associations between disabilities and current school attendance, having ever attended school (school entrance), and private school attendance and OLS for school grade attainment (attainment). I also run the logit model to see the associations between disabilities and FLS numeracy and reading. I then run the same model with schooling status to see whether some of the associations between disabilities and learning occur via differences in their schooling.

Descriptive Statistics

This section provides descriptive statistics on independent, dependent, and control variables. Table 10 shows the descriptive statistics using the Stata SVY command to incorporate the survey design with probability weights. While MICS6 asks about the schooling status of children aged 5–17, it measures FLS among children aged 7–14. However, no significant difference emerges between these two age groups across three countries. Thus, I discuss descriptive statistics based on children aged 5–17, except for FLS outcomes available only for the 7–14 age group.

Table 10
Descriptive Statistics on Key Independent, Dependent, and Control Variables

	Age 5–17 (schooling)			Age 7–14 (FLS)		
	Bangladesh (BGD)	Pakistan (PAK)	Ghana (GHA)	Bangladesh (BGD)	Pakistan (PAK)	Ghana (GHA)
Independent variable						
Prevalence of disabilities	8.1%	17.3%	20.4%	8.1%	16.8%	20.9%
Dependent variables						
FLS numeracy				40%	20%	26%
FLS reading				50%	39%	22%
School attendance	83%	74%	90%	92%	84%	95%
Educational attainment	5.1	4.0	4.2	4.6	3.9	4.0
School entrance	95%	87%	95%	98%	91%	97%
Private attendance	37%	28%	21%	36%	32%	24%
Control variables						
Age	11.5	11.3	11.3	10.6	10.5	10.5
Male	51%	51%	51%	49%	49%	51%
HH head parent	86%	81%	72%	87%	81%	72%
HH head grandparent	9%	13%	15%	10%	14%	16%
Male headed household	89%	91%	68%	89%	91%	69%
# of children in household	2.5	4.3	4.2	2.5	4.4	4.2
Language minority	1%	32%	52%	1%	32%	52%
Religious minority	9%		32%	9%		31%
Urban	20%	35%	43%	21%	34%	43%
Mother's education above secondary	43%	18%	10%	44%	19%	11%
Observations	35,930	28,898	7,545	21,934	15,829	5,288

Note. Pakistan does not collect the religious background of households.

At first, the prevalence of disabilities differs by country. For example, while only 8.1% of children in Bangladesh are regarded as children with disabilities, 20.4% and 17.3% of children in Ghana and Pakistan are considered children with disabilities.

Regarding independent variables, these countries differ significantly. In general, the educational situation in Bangladesh is better than that in Pakistan and Ghana; 40% and 50% of

children have FLS numeracy and reading, respectively. Educational attainment is also longer in Bangladesh than in the two other countries by about one year. Although 95% of children entered primary school, only 83% currently attend school, representing less attendance in Bangladesh than in Ghana. Notably, 37% of children attend private school, higher than the two countries. Among the three countries, the educational situation of Pakistan appears the worst. Although 39% of children have FLS reading (higher than in Ghana), only 20% of children have FLS numeracy, representing the lowest percentage of the three. Eighty-seven percent of children entered primary school, and 74% currently attend school. The average educational attainment is four years. These educational figures are the worst among the three countries. Currently, 28% of children attend private school in Pakistan. The learning status of children in Ghana is worse than in Bangladesh. Although only 26% and 22% of children have FLS numeracy and reading, respectively, schooling status is better in Ghana than in Bangladesh, and 95% of children entered primary school, with 90% currently attending school. Private school attendance is the lowest among the three countries, and only 21% of children attend private school.

Regarding control variables, Bangladesh and Pakistan are similar in terms of heads of households. However, Ghana differs from these two countries, and more households are headed by nonparents and females. However, with respect to the number of children in a household, Pakistan and Ghana are similar, and Bangladeshi households have over 1.5 children fewer per household than in these two other countries. Regarding diversity, Bangladesh appears to be more homogeneous, and it has only 1% and 9% of minorities in language and religion, respectively. While Pakistan does not collect religious information, language is more diverse than Bangladesh, and about one-third of households use minority languages. Ghana is a diverse society, and more than half of households speak a minority language, with about one-third of households

representing a religious minority. Ghana is the most urbanized, with 43% of households residing in urban areas. Pakistan follows, where about one-third of households are in urban areas. Bangladesh is the least urbanized country, with only 20% of households in urban areas. However, concerning the educational background of mothers, 43% of Bangladeshi mothers complete secondary education; by contrast, only 18% and 10% of mothers in Pakistan and Ghana complete secondary education.

Associations Between Disabilities and Schooling/Learning

In this section, I run regressions to reveal the associations between disabilities and schooling/learning. I also use predicted probabilities to contextualize the sizes of the associations. At first, I examine school attendance and entrance, then school attainment and private school attendance. Finally, I examine FLS numeracy and reading.

Table 11
Association Between Disability and School Attendance/Entrance, Logit Odds Ratio Analysis, by Country, Age 5–17

	Current school attendance			Ever attended a school		
	BGD	PAK	GHA	BGD	PAK	GHA
Disabilities	0.52***	0.68***	0.77	0.34***	0.60***	0.74
	(0.036)	(0.032)	(0.127)	(0.034)	(0.037)	(0.178)
Age of child	3.46***	3.32***	5.86***	7.31***	3.38***	7.50***
Age squared	0.94***	0.94***	0.92***	0.92***	0.95***	0.92***
Male	0.49***	1.28***	1.12	0.65***	1.71***	0.93
HH head is parent	4.18***	1.31***	2.42***	1.40	1.33**	2.26*
HH head is grandparent	5.18***	1.72***	1.81*	1.52*	1.61***	1.54
Male-headed HH	1.07	1.13	0.98	1.14	1.12	0.81
# of children in household	0.83***	0.94***	0.94*	0.80***	0.93***	0.92*
Poor	1.29***	2.92***	2.83***	1.36**	3.69***	3.77***
Middle	1.67***	5.14***	3.25***	1.79***	7.29***	3.70***

Table 11 (cont'd)

Rich	1.82***	7.56***	3.42***	1.88***	9.89***	9.40***
Richest	2.97***	13.42***	4.28***	2.91***	21.61***	5.82***
Language minority	1.00	0.68***	0.77	0.97	0.53***	0.63
Religious minority	1.65***		0.62**	1.11		0.52**
Urban	0.70***	0.71***	1.05	0.73*	0.73***	2.19*
Mothers' education at secondary or above	2.37***	2.48***	2.16**	2.25***	2.68***	6.37*
Observations	35,930	28,898	7,545	35,930	28,898	7,545

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.
BGD = Bangladesh; PAK = Pakistan; GHA = Ghana; HH = household.

Table 11 analyzes the relationship between disabilities and school attendance/entry among children aged 5–17, and it shows the odds ratio based on a logit model estimation. Before discussing the relationship, I would like to describe common characteristics between school attendance/entry and control variables among the three countries, then country-specific features. At first, older children have better school attendance/entry, and the relationship is not linear but concave. Second, children living alongside other children in the same household tend to attend/enter school less frequently. Third, the socioeconomic status of the household matters, and children from wealthier households and those with better-educated mothers tend to attend/enter school more often. Lastly, the sex of the household head does not matter for school attendance/entry of children.

In terms of country-specific characteristics, first, the association between the sex of the child and school attendance/entry differs across three countries. While girls are more likely to enter and attend school than are boys in Bangladesh, boys are more likely to enter and attend school than are girls in Pakistan. In Ghana, girls and boys have a similar school attendance/entry. Second, the relationship between school attendance/entry and the type of household head is complicated and inconsistent. In Bangladesh and Ghana, compared to other kinds of household heads, such as

uncle/aunt and a third person, children from a parent- or grandparent-headed household attend school more often. However, such a relationship does not exist in school entry. Contrarily, in Pakistan, children from parent-headed households are more likely to enter school, while such a relationship does not appear in school attendance. Furthermore, children from grandparent-headed households have better school attendance/entrance. Third, the situation of minority children differs across the three countries. In Bangladesh, both religious and linguistic minorities have a school entry rate similar to that of linguistic majorities. However, in school attendance, only religious minorities maintain better school attendance. Pakistan does not collect information on religious minorities, but their language minorities have less school attendance/entrance. In Ghana, while language minorities have a similar school attendance level to majorities, religious minorities have less school attendance and entrance. The final element is urban residency. In both Bangladesh and Pakistan, children in urban areas experience less school attendance and entrance. Contrarily in Ghana, although children in urban and rural areas have similar school attendance, urban children have better school entrance.

Regarding children with disabilities, disabilities are significantly negatively associated with school attendance and entrance in Bangladesh and Pakistan. Even in Ghana, disabilities are negatively associated with school attendance and entrance, but the associations are not statistically significant. Notably, the sample size of Ghana is less than one-third of the other two countries, and indeed, the standard error of Ghana's estimation is larger than that of the other two countries by about four times.

Table 12
Association Between Disability and Grade Attainment/Private School Attendance, OLS and Logit (Odds Ratio) Analysis, by Country, Age 5–17

	Grade attainment			Private school attendance		
	BGD	PAK	GHA	BGD	PAK	GHA
Disabilities	–0.43***	–0.23***	–0.17	0.82***	0.80***	0.65**
	(0.053)	(0.046)	(0.091)	(0.048)	(0.038)	(0.090)
Age of child	0.96***	1.42***	1.38***	2.20***	1.44***	1.31*
Age squared	–0.01***	–0.04***	–0.04***	0.98***	0.98***	0.98***
Male	–0.61***	0.21***	–0.08	0.75***	1.27***	1.00
HH head is parent	0.59***	0.24**	0.57***	2.41***	0.98	2.31***
HH head is grandparent	0.59***	0.28***	0.49***	2.56***	1.32**	1.84**
Male-headed HH	0.09*	–0.04	–0.05	1.10	0.86**	0.88
# of children in household	–0.17***	–0.07***	–0.03	0.89***	0.94***	0.94*
Poor	0.30***	1.14***	0.74***	1.31***	3.13***	2.19**
Middle	0.55***	1.65***	0.76***	1.65***	5.67***	4.35***
Rich	0.56***	1.90***	1.00***	2.01***	10.24***	7.36***
Richest	0.90***	1.97***	1.10***	3.31***	24.45***	15.01***
Language minority	–0.09	–0.26***	0.04	1.23	0.90*	1.01
Religious minority	0.33***		–0.35***	1.31***		0.59***
Urban	–0.27***	–0.26***	–0.09	0.95	0.89*	1.32*
Mothers' education at secondary or above	0.70***	0.27***	0.17	1.63***	1.95***	1.48**
R2	0.690	0.395	0.540			
Observations	35,930	28,898	7,545	35,930	28,898	7,545

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 12 analyzes the associations between educational attainment/private school attendance and disabilities. Generally speaking, the characteristics of the relationship between educational attainment/private school attendance and control variables are similar to those between school attendance/entrance and control variables.

The relationship between educational attainment and disabilities is similar to those between school attendance and disabilities. In Bangladesh and Pakistan, disabilities are significantly

negatively associated with school attainment. In Ghana, such a negative association is present but not significant. In all three nations, disabilities are significantly negatively associated with private school attendance.

Table 13
Association Between Disability and FLS Numeracy, Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD		PAK		GHA	
	(1)	(2)	(3)	(4)	(5)	(6)
Disabilities	0.73***	0.75***	0.86*	0.88	0.64***	0.70*
	(0.056)	(0.062)	(0.056)	(0.058)	(0.080)	(0.096)
Age of child	4.40***	3.25***	2.86***	2.49***	2.97***	2.28**
Age squared	0.95***	0.95***	0.96***	0.97***	0.96**	0.96**
Male	0.86***	1.04	1.18***	1.13*	1.19	1.27
HH head is parent	1.20	1.06	0.89	0.86	1.87***	1.34
HH head is grandparent	1.20	1.04	0.88	0.85	1.33	1.04
Male-headed HH	1.08	1.05	0.92	0.90	1.03	1.03
# of children in household	0.88***	0.92***	0.96*	0.97*	0.93*	0.96
Poor	1.27***	1.18**	1.91***	1.55***	1.58*	1.23
Middle	1.41***	1.22**	2.00***	1.53***	1.62*	1.11
Rich	1.60***	1.39***	2.08***	1.53***	2.41***	1.40
Richest	2.53***	1.98***	2.18***	1.57***	3.81***	1.78*
Language minority	0.88	0.88	1.31***	1.38***	0.75*	0.80
Religious minority	1.09	0.97			0.81	0.96
Urban	0.94	1.02	1.20**	1.22**	1.30	1.23
Mothers' education at secondary or above	1.83***	1.42***	1.63***	1.58***	1.53**	1.29

Table 13 (cont'd)

Currently attending school		1.25*		3.87***		3.35*
Private school attendance		1.28***		1.02		1.99***
Highest grade attained		1.45***				1.50***
Observations	21,935	21,935	15,829	15,829	5,288	5,288

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 14

Association Between Disability and FLS Numeracy, Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD		PAK		GHA	
	(1)	(2)	(3)	(4)	(5)	(6)
Disabilities	0.58***	0.58***	0.72***	0.74***	0.54***	0.59**
	(0.043)	(0.049)	(0.042)	(0.045)	(0.097)	(0.112)
Age of child	5.03***	3.07***	5.25***	3.55***	4.00***	2.88***
Age squared	0.95***	0.95***	0.94***	0.96***	0.96***	0.95***
Male	0.68***	0.89**	0.90*	0.79***	0.97	1.05
HH head is parent	1.18	0.99	1.14	1.10	2.83***	1.85**
HH head is grandparent	1.28	1.04	1.23	1.14	2.37**	1.75
Male-headed HH	1.08	1.05	0.92	0.87	0.91	0.88
# of children in household	0.83***	0.87***	0.96**	0.98	0.90**	0.93
Poor	1.28***	1.16*	2.34***	1.68***	2.07**	1.53
Middle	1.55***	1.29***	3.41***	2.21***	3.89***	2.55***
Rich	1.69***	1.43***	4.13***	2.49***	4.80***	2.35***
Richest	2.74***	2.03***	5.81***	3.50***	12.33***	4.61***
Language minority	1.04	1.06	1.09	1.24***	1.25	1.49**
Religious minority	1.21**	1.02			0.52***	0.62**
Urban	1.00	1.15*	0.91	0.94	1.87***	1.88***

Table 14 (cont'd)

Mothers' education secondary or above	2.10***	1.50***	1.86***	1.79***	2.22***	1.84***
Currently attending school		1.68***		29.56***		1.16
Private school attendance		1.29***		1.07		3.04***
Highest grade attained		1.72***				1.94***
Observations	21,935	21,935	15,829	15,829	5,288	5,288

Tables 13 and 14 analyze associations between disabilities and learning (FLS numeracy and reading) among children aged 7–14 with a logit model. While Models 1, 3, and 5 in each table do not consider differences in schooling status, such as current school attendance, grade attainment, and private school attendance, Models 2, 4, and 6 accounts for such factors.

Certain common characteristics in the relationship between learning and control variables appear across all three countries in both subjects. First, the math and reading FLS acquisition status improves as children get older, and its form is nonlinear but concave. Second, children from wealthier households show better FLS acquisition in numeracy and reading, but part of it is via their schooling status (attendance, entrance, and private school attendance). Third, schooling status generally improves FLS acquisition, although there are some small differences. For instance, private school attendance is positively associated with FLS acquisition in Bangladesh and Ghana, but not in Pakistan. Fourth, there seems to be an urban advantage in all countries, although there are certain differences. The urban advantage exists only in FLS reading in Bangladesh and Ghana, while it is observed only in numeracy in Pakistan. Fifth, higher education levels among mothers are associated with better FLS acquisition in both subjects, but a part of the relationship is via their schooling status.

Certain country-specific characteristics appear in the relationship between learning and control variables. The first element is the sex of a child. After accounting for schooling status, girls perform better at reading, but there is no significant difference in mathematics. In Pakistan, boys perform better at mathematics, while girls perform better at reading. However, there is no significant difference between boys and girls in these subjects in Ghana. In other words, the association between learning and the sex of a child differs among these countries. The second factor is the type of household head. In Bangladesh and Pakistan, the type of household head is not associated with FLS acquisition. However, in Ghana, where more households are headed by nonparents, children from households headed by their parents display better FLS acquisition in reading, but not in numeracy. The last element is minority status. In Bangladesh, after accounting for schooling status, minorities have a similar level of FLS acquisition in both subjects. However, in Pakistan, unlike the case of schooling, minority children acquire higher levels of FLS in both subjects. In Ghana, minorities have similar acquisition levels as their counterparts in mathematics. However, while children of language minorities show better acquisition levels in reading, the children of religious minorities have lower levels of FLS.

Regarding children with disabilities, across all the three countries and both subjects, children with disabilities acquire less FLS than do children without disabilities. When accounting for their schooling status, coefficients become a bit smaller. Thus, a small portion of their low FLS acquisition might be attributable to their low schooling status. However, even after accounting for their schooling status, coefficients remain statistically significant, except for numeracy in Pakistan.

Summary of Chapter 5

I summarize the results of this chapter using the summary tables below.

Table 15
Summary of Associations Between Disabilities and Education Outcomes, by Country

	BGD	PAK	GHA
Schooling			
Attendance	–	–	NS
Entrance	–	–	NS
Attainment	–	–	NS
Private school	–	–	–
Learning			
Numeracy without schooling	–	–	–
Numeracy with schooling	–	NS	–
Reading without schooling	–	–	–
Reading with schooling	–	–	–

Note. – indicates a statistically significant negative association, + indicates the positive association, and NS indicates the absence of a statistically significant association.

Generally speaking, disability status was negatively associated with all aspects of schooling and learning in Bangladesh. Nearly the same result holds for Pakistan, but the negative association between disability and numeracy skills seemed to emerge from a disadvantaged schooling status among children with disabilities. In Ghana, disability status was negatively associated with learning but this is not the case for schooling, except for private school attendance.

Table 16
Predicted Probabilities of Association Between Disability and Education Outcomes, by Country

	Attendance		
	BGD	PAK	GHA
Current attendance			
Without disabilities	0.83	0.75	0.90
Disabilities	0.75	0.70	0.89
Ever attended school			
Without disabilities	0.96	0.88	0.95

Table 16 (cont'd)

Disabilities	0.94	0.82	0.94
Grade attainment			
Without disabilities	5.2	4.1	4.3
Disabilities	4.3	3.7	4.1
Private school attendance			
Without disabilities	0.38	0.28	0.22
Disabilities	0.30	0.26	0.16
Numeracy			
Without disabilities	0.40	0.20	0.28
Disabilities	0.31	0.18	0.20
Reading			
Without disabilities	0.51	0.41	0.24
Disabilities	0.36	0.34	0.15

Note. Predicted probabilities of numeracy and reading are based on the models that consider schooling status.

A problem with the logit model is the difficulty of its interpretation. Thus, I examine predicted probabilities, as recommended by Long and Mustillo (2021). Table 16 displays the predicted probabilities of attending/entering school for children with and without disabilities.

In Bangladesh, while the likelihood of children without disabilities currently attending school is 83%, that of children with disabilities is 75%. In Pakistan, these probabilities are 85% and 70%, respectively. However, as the results of the logistic regression show, the likelihood is almost the same between children with and without disabilities in Ghana. Regarding the predicted probability of school entrance, the probabilities among children with disabilities are high in all the countries, a result that differs from that of previous studies (Filmer, 2008; Mizunoya et al., 2018). In these three countries, children with disabilities are likely to reach the fourth grade. Regarding grade attainment, considering the mean age of the sample (about 10.5 years old), these figures imply that children with disabilities in these three countries likely enter school without significant delay and progress to the fourth grade without much repetition. Regarding private school attendance, gaps associated with disabilities are present. In Pakistan, however, the gap is just two

percentage points. Regarding learning, the likelihood of children with disabilities acquiring FLS is low across all three countries. However, in Pakistan, the gap is salient only in reading. In Ghana, the gap in the probability between children with and without disabilities is pronounced.

Chapter 6. Do the Social Model and Medical Model of Disability Modify the Associations Between Disabilities and Schooling/Learning?

This section examines how social and medical models of disability help to explain the association between disability and education that I uncovered in Chapter 5. Specifically, I examine whether socioeconomic and demographic factors and the type and severity of disabilities modify the associations between disabilities and schooling/learning. First, I provide descriptive statistics on the disaggregated prevalence of disability. Other descriptive statistics have already been discussed in the previous chapter. Then, in accordance with the social model, I examine whether household wealth, household location, and the sex of a child modify the associations. Finally, commensurate with the medical model, I examine whether the associations are modified by the type and severity of disability.

Description of Type and Severity of Disabilities

As discussed in the previous section, the Washington Group on Disability Statistics categorizes disabilities into two types. One is listed in the short survey (WG-SS), and the other is not listed (nonWG-SS). The former is assumed to prevent people with disabilities from social participation more than the latter.

Regarding the severity of disability, the MICS collected information based on four functional difficulty levels, excepting anxiety and depression: no difficulty, some difficulty, a lot of difficulty or cannot do at all. Thus, the severity of disability is not dependent on disability type. MICS took this approach because "disability is not a yes/no dichotomy, but can be conceptualized on a continuum from minor difficulties in functioning to severe difficulties that may have a major impact on a person's life. Therefore, graded answer categories are designed to reflect this

continuum“ (Loeb et al., 2017, p.4). I follow the severity classification set in Loeb et al. (2017) and Cappa et al. (2018): mild difficulties (at least some difficulty on one or more domains of functioning), or moderate levels of difficulties (those who respond at least a lot of difficulty) or those with severe difficulties (those who respond cannot do at all)[12]. As a side note, unlike the type of disability, categories in the severity of disability are mutually exclusive. Thus, if a child has severe disabilities in any domain, they are regarded as having severe disabilities even if they have either moderate or mild disabilities in other domains. Likewise, suppose a child has moderate disabilities in any domain without having severe disabilities. In that case, they are regarded as having moderate disabilities even if they have mild disabilities in other domains. Accordingly, the sum of the prevalence of moderate and severe disabilities should be equal to the prevalence of children with disabilities.

Prevalence of Disabilities by Type and Severity

Table 17
Prevalence of Disabilities by Type and Severity Among Children Age 5–17 and Age 7–14 (%)

	Age 5–17			Age 7–14		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
Disabilities listed in the short survey (WG-SS)						
Seeing	0.003	0.004	0.005	0.002	0.002	0.004
Hearing	0.003	0.004	0.003	0.001	0.001	0.003
Walking	0.008	0.026	0.007	0.005	0.022	0.007
Selfcare	0.009	0.008	0.007	0.005	0.004	0.004

Table 17 (cont'd)

[12] Children with mild disabilities are not regarded as children with disabilities by the definition set by UNICEF and the Washington Group on Disability Statistics. Cappa et al. (2018) conducted field test in Samoa, Mexico, and Serbia to decide this cut-off based on the following criteria: consistency in prevalence levels; conformity to expected patterns across domains and within sociodemographic groups based on past studies; prevalence of false positive cases based on caregivers' responses to probes; and analysis of interviewers' feedback on the implementation of the module to detect difficulties with the respondents' understanding of the questions and their ability and willingness to answer them under field conditions, and confirmed the appropriateness of this cut-off. However, Sprunt et al. (2019) argued that this cut-off was not appropriate in the case of Fiji.

Communication	0.006	0.010	0.007	0.002	0.003	0.003
Remembering	0.017	0.012	0.040	0.015	0.008	0.044
Disabilities listed in the short survey, total	0.028 (0.011)	0.041 (0.020)	0.061 (0.025)	0.024 (0.010)	0.032 (0.019)	0.059 (0.024)
Disabilities not listed in the short survey (non WG-SS)						
Learning	0.016	0.011	0.053	0.014	0.006	0.054
Concentrating	0.009	0.011	0.021	0.005	0.006	0.021
Accepting	0.012	0.040	0.031	0.009	0.037	0.034
Controlling	0.021	0.089	0.057	0.018	0.087	0.060
Making friends	0.006	0.018	0.021	0.002	0.013	0.020
Anxiety	0.032	0.038	0.044	0.032	0.033	0.041
Depression	0.037	0.028	0.030	0.038	0.024	0.025
Disabilities not listed in the short survey, total	0.071 (0.053)	0.153 (0.132)	0.179 (0.143)	0.071 (0.057)	0.150 (0.136)	0.185 (0.150)
Having both types	0.018	0.021	0.037	0.014	0.014	0.035
Severity of disabilities						
Mild disabilities	0.389	0.478	0.611	0.381	0.491	0.610
Moderate disabilities	0.068	0.148	0.190	0.072	0.150	0.201
Severe disabilities	0.013	0.024	0.014	0.010	0.019	0.008
Prevalence of disabilities	0.081	0.173	0.204	0.081	0.168	0.209
Observations	35,930	28,898	7,545	21,934	15,829	5,288

Note. Values in parenthesis eliminate children with both more and less significant types of disabilities.

Table 17 presents descriptive statistics on disabilities by type and severity using the Stata SVY command to incorporate the survey design with probability weights. In the analysis, the schooling part focuses on children aged 5–17, while the learning part is children aged 7–14. These two groups show similar characteristics. Thus, I discuss the prevalence of disabilities based on children aged 5–17.

Overall, Ghana displays a higher prevalence of children with disabilities (20.4%), followed by Pakistan (17.3%). Compared to these two countries, the prevalence was much lower in Bangladesh (8.1%). The same trend was observed in the prevalence of the more significant types of disabilities but the differences across the three countries were slight. In the case of Pakistan, disability in walking is greater than in the other two countries. In the case of Ghana, disability in remembering is higher than in the other two countries. However, the other four types of disabilities under the more significant type of disabilities show a similar degree of prevalence across the three countries. The trend in the prevalence of disabilities can also be observed in the prevalence of less significant types of disabilities, and the difference across the three countries is large. Ghana shows a higher prevalence of learning disabilities. Pakistan has a high prevalence of disability in controlling behavior. In Bangladesh, the prevalence of disability in controlling behavior is low.

Regarding the severity of disabilities, the prevalence of severe disabilities is similar across the three countries. However, when it comes to mild and moderate disabilities, Bangladesh has the lowest prevalence (6.8% and 38.9%), Pakistan has the next highest (14.8% and 47.8%), and Ghana has the highest (19.0% and 61.1%). In short, the difference in the prevalence of disabilities across the three countries is mainly driven by the prevalence of moderate disabilities, not the severe ones, and the prevalence of certain types of disabilities.

Are Associations Between Disabilities and Educational Outcomes Modified by Factors Predicted by the Social Model of Disability – Wealth, Sex, and Location?

In this subsection, I examine whether socioeconomic or demographic characteristics moderate the associations between disabilities and schooling/learning.

Based on the social model of disability, disability is caused by the way society is organized rather than by a person's impairment (Oliver, 1983; Oliver, 1990; Oliver, 1996). Thus, while well-resourced social strata (e.g., for children in the wealthiest households and urban areas), might be able to provide reasonable accommodations to enable children with disabilities to access school, and poorly resourced societies might not do so. Furthermore, in traditionally patriarchal societies, female students may face cultural and social impediments that limit their access to education and other opportunities. Thus, I examine whether such characteristics exist using interaction terms. In the following tables, I interact disabilities with 1) the sex of the child, 2) household location, and 3) household wealth. Table 18 is about school attendance, Table 19 is about school entrance, and Table 20 shows the average marginal effects and its decomposition in school attendance and entry. Table 21 regards school attainment; Table 22, private school attendance; and Table 23, the average marginal effect and its decomposition in school attainment and private school attendance. Tale 24 concerns FLS numeracy; Table 25, FLS reading; and Table 26, the average marginal effect and its decomposition.

Table 18
Prevalence of Disabilities by Type and Severity Among Children Age 5–17 and Age 7–14 (%)

	BGD			PAK			GHA		
Disabilities	0.45***	0.51***	0.53***	0.70***	0.69***	0.77***	0.81	0.94	0.82
	(0.054)	(0.038)	(0.057)	(0.047)	(0.037)	(0.061)	(0.184)	(0.187)	(0.185)
Disabilities * male	1.26			0.93			0.90		
	(0.188)			(0.087)			(0.285)		
Disabilities * urban		1.18			0.97			0.58	
		(0.223)			(0.106)			(0.199)	
Disabilities * poor			0.77			0.99			2.27*
			(0.137)			(0.119)			(0.927)
Disabilities * middle			1.19			0.80			0.59
			(0.233)			(0.110)			(0.262)
Disabilities * rich			1.05			0.64**			1.12
			(0.238)			(0.089)			(0.594)
Disabilities * richest			1.11			1.00			0.31*
			(0.275)			(0.194)			(0.142)
Observations	35,930	35,930	35,930	28,898	28,898	28,898	7,545	7,545	7,545

Note. The following variables are controlled for: age of a child, age squared, boys, HH head as parent, HH head as grandparent, male-headed HH, # of children in household, wealth index, language minority, religious minority (except for Pakistan), urban, and mothers' education at secondary or above.
* Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level

Table 19

Association Between Disability and School Entry Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	BGD			PAK			GHA		
Disabilities	0.28***	0.34***	0.36***	0.68***	0.61***	0.77***	0.88	0.81	0.82
	(0.042)	(0.036)	(0.060)	(0.057)	(0.041)	(0.061)	(0.389)	(0.230)	(0.185)
Disabilities * male	1.42			0.76*			0.71		
	(0.290)			(0.090)			(0.358)		
Disabilities * urban		1.01			0.93			0.63	
		(0.287)			(0.149)			(0.307)	
Disabilities * poor			0.87			0.99			2.27*
			(0.225)			(0.119)			(0.927)
Disabilities * middle			0.89			0.80			0.59
			(0.239)			(0.110)			(0.262)
Disabilities * rich			0.80			0.64**			1.12
			(0.270)			(0.089)			(0.594)
Disabilities * richest			1.24			1.00			0.31*
			(0.419)			(0.194)			(0.142)
Observations	35,930	35,930	35,930	28,898	28,898	28,898	7,545	7,545	7,545

Note. The following variables are controlled for: age of a child, age squared, boys, HH head as parent, HH head as grandparent, male-headed HH, # of children in household, wealth index, language minority, religious minority (except for Pakistan), urban, and mothers' education at secondary or above.

* Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level

Table 20

Average Marginal Effect of Disability by Sex, Wealth, Location on School Attendance/Entry, by Country

	School attendance			School entry		
	BGD	PAK	GHA	BGD	PAK	GHA
Sex of a child						
Average marginal effect of disabilities within boys	–0.082	–0.057	–0.009	–0.066	–0.064	–0.006
Average marginal effect of disabilities within girls	–0.082	–0.045	–0.018	–0.074	–0.042	–0.004
Location						
Average marginal effect of disabilities within rural	–0.090	–0.049	**0.012**	–0.072	–0.061	0.004
Average marginal effect of disabilities within urban	–0.060	–0.057	**–0.046**	–0.063	–0.039	–0.014
Wealth						
Average marginal effect of disabilities within poorest	–0.097	–0.047	–0.006	–0.070	–0.053	–0.008
Average marginal effect of disabilities within poor	–0.140	–0.041	0.046	–0.058	–0.064	0.011
Average marginal effect of disabilities within middle	–0.056	–0.077	–0.059	–0.038	–0.068	–0.022
Average marginal effect of disabilities within wealthy	–0.064	–0.087	–0.000	–0.044	–0.066	0.007
Average marginal effect of disabilities within wealthiest	–0.038	–0.019	–0.074	–0.014	–0.023	–0.026

Note. Each value indicates the average marginal effect of disabilities in the given education outcome within a specific category. Except wealth, the bold letter indicates the second difference is statistically significant at the 5% level, and the associations are modified by the category. Regarding wealth, the second difference between the following pairs are statistically significant at the 5% level:
Bangladesh (attendance): poorest-wealthiest, poor-middle, poor-wealthy, and poor-wealthiest,
Bangladesh (entrance): poorest-wealthiest, poor-wealthiest,
Pakistan (attendance): poor-wealthier, middle-wealthiest, wealthy-wealthiest,
Pakistan (entrance): poor-wealthiest, middle-wealthiest, wealthy-wealthiest,
Ghana (attendance): poor-middle, poor-wealthiest. wealthy-wealthiest, and
Ghana (entrance): wealthy-wealthiest.

Regarding school attendance (Table 18), the interaction term of the sex of a child is not significant in all the three countries, as also confirmed by the second difference (Table 20). The interaction term of household location is not significant in all three countries. However, the second difference indicates that urban residence exacerbates the association in Ghana. Regarding household wealth, certain interaction terms are significant in Pakistan and Ghana. Looking at the second differences, the average marginal effect of disabilities among the wealthiest households differs significantly from the poorest and the poor households in Bangladesh. In addition, wealthy households differ significantly from poor households. Thus, the wealth seems to mitigate the association between disabilities and school attendance. The wealthiest households differ significantly from the poor, middle, and wealthy households in Pakistan. Thus, as is the case of Bangladesh, wealth seems to mitigate the association between disabilities and school attendance. In Ghana, the poor households differ significantly from the middle and wealthiest households, and wealthy households also differ significantly from the wealthiest households. However, the directions of coefficients are inconsistent, and it is difficult to conclude that wealth moderates the association between disabilities and school attendance.

Regarding school entrance (Table 19), the interaction term of the sex of a child is not significant in Bangladesh and Ghana but it is significant in Pakistan. However, the second difference (Table 20) indicated the average marginal effect of disabilities does not differ significantly between boys and girls in Pakistan. Thus, the sex of a child seems not to moderate the association between disabilities and school entrance in the three countries. Regarding household location, the interaction terms are not significant in the three countries, as also supported by the second difference. Regarding wealth, some interaction terms are significant in Pakistan and Ghana. However, in Bangladesh, the second differences indicate that the wealthiest households

differ significantly from the poorest and poor households. Thus, the wealth seems to mitigate the association between disabilities and school entrance. The wealthiest households differ significantly from the poor, middle, and wealthy households in Pakistan. Thus, as is the case of Bangladesh, wealth seems to mitigate the association. The significant difference appears only between the wealthiest and wealthy households in Ghana. Thus, wealth seems not to moderate the association.

Table 21

Association Between Disabilities and Grade Attainment Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	Bangladesh			Pakistan			Ghana		
Disabilities	–0.42***	–0.45***	–0.44***	–0.20**	–0.19***	–0.11	–0.12	–0.06	–0.27
	(0.075)	(0.057)	(0.102)	(0.067)	(0.054)	(0.084)	(0.147)	(0.124)	(0.142)
Disabilities *	–0.02			–0.05			–0.11		
male	(0.109)			(0.093)			(0.183)		
Disabilities *		0.12			–0.10			–0.27	
urban		(0.153)			(0.100)			(0.180)	
Disabilities *			–0.13			–0.07			0.29
poor			(0.155)			(0.146)			(0.225)
Disabilities *			–0.05			–0.23			–0.09
middle			(0.162)			(0.130)			(0.271)
Disabilities *			–0.04			–0.31*			0.29
rich			(0.167)			(0.130)			(0.222)
Disabilities *			0.43**			0.02			–0.07
richest			(0.164)			(0.138)			(0.268)
Observations	35,930	35,930	35,930	28,898	28,898	28,898	7,545	7,545	7,545

Note. The following variables are controlled for: the age of a child, age squared, boys, HH head as parent, HH head as grandparent, male-headed HH, # of children in household, wealth index, language minority, religious minority (except for Pakistan), urban, and mothers' education at secondary or above.

* Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level

Table 22

Association Between Disabilities and Private School Attendance Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	Bangladesh			Pakistan			Ghana		
Disabilities	0.77**	0.85*	0.69**	0.72***	0.80***	0.66*	0.64**	0.66	0.96
	(0.069)	(0.054)	(0.087)	(0.052)	(0.049)	(0.113)	(0.108)	(0.140)	(0.461)
Disabilities * male	1.12			1.23*			1.06		
	(0.138)			(0.113)			(0.303)		
Disabilities * urban		0.83			1.00			0.98	
		(0.135)			(0.096)			(0.277)	
Disabilities * poor			1.10			1.27			0.61
			(0.211)			(0.265)			(0.382)
Disabilities * middle			1.47*			1.08			0.64
			(0.257)			(0.210)			(0.343)
Disabilities * rich			1.27			1.25			0.62
			(0.249)			(0.240)			(0.332)
Disabilities * richest			1.18			1.34			0.77
			(0.261)			(0.268)			(0.417)
Observations	35,930	35,930	35,930	28,898	28,898	28,898	7,545	7,545	7,545

Note. The following variables are controlled for: age of a child, age squared, boys, HH head as parent, HH head as grandparent, male-headed HH, # of children in household, wealth index, language minority, religious minority (except for Pakistan), urban, and mothers' education at secondary or above.

* Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level

Table 23

Average Marginal Effect of Disability by Sex, Wealth, Location on Grade Attainment and Private School Attendance, by Country

	Grade attainment			Private school attendance		
	BGD	PAK	GHA	BGD	PAK	GHA
Sex of a child						
Average marginal effect of disabilities within boys	–0.861	–0.426	–0.291	–0.061	**–0.015**	–0.048
Average marginal effect of disabilities within girls	–0.914	–0.360	–0.066	–0.091	**–0.041**	–0.076
Location						
Average marginal effect of disabilities within rural	–0.938	–0.379	**0.011**	–0.067	–0.046	**–0.030**
Average marginal effect of disabilities within urban	–0.704	–0.423	**–0.427**	–0.101	–0.020	**–0.096**
Wealth						
Average marginal effect of disabilities within poorest	–0.989	–0.420	–0.299	–0.076	–0.016	0.002
Average marginal effect of disabilities within poor	-1.054	–0.349	–0.184	–0.082	–0.015	–0.034
Average marginal effect of disabilities within middle	–0.723	–0.471	–0.295	–0.017	–0.060	–0.066
Average marginal effect of disabilities within wealthy	-1.004	–0.544	–0.010	–0.074	–0.037	–0.095
Average marginal effect of disabilities within wealthiest	–0.116	–0.264	–0.206	–0.060	–0.027	–0.093

Note. Each value indicates the average marginal effect of disabilities in the given education outcome within a specific category. Except wealth, the bold letter indicates the second difference is statistically significant at the 5% level, and the associations are modified by category. Regarding wealth, the second difference between the following pairs are statistically significant at 5% level:
Bangladesh (attainment): poorest-wealthiest, poor-wealthiest, middle-wealthiest, wealthy-wealthiest,
Bangladesh (private): no,
Pakistan (attainment): no,
Pakistan (private): poorest- middle, poor-middle,
Ghana (attainment): no, and
Ghana (private): poorest-middle, poorest-wealthy.

Regarding school attainment (Table 21), the interaction terms of the sex of a child are not significant in all the three countries, as also supported by the second differences (Table 23). Thus, the child's sex does not moderate the association between disabilities and school attainment. Regarding household location, the interaction terms are not significant. However, the second difference indicates a significant difference in Ghana, and urban residency exacerbates the association between disabilities and school attainment. Regarding household wealth, certain interaction terms are significant in Bangladesh and Pakistan. In Bangladesh, the wealthiest households differ significantly from the rest of the households. Thus, the wealth seems to mitigate the association. However, in Pakistan and Ghana, the wealth seems not to moderate the association.

Regarding private school attendance (Table 22), the interaction terms of the sex of a child are significant only in Pakistan, as is also supported by the second differences (Table 23). Being a girl seems to exacerbate the association between disabilities and private school attendance in Pakistan. However, in Bangladesh and Pakistan, the sex of a child does not moderate the association. None of the interaction terms are significant regarding the household location, but the second difference indicates that urban residency exacerbates the association in Ghana. Regarding household wealth, only the middle households in Bangladesh are significant. The second differences also show that wealth seems not to moderate the association between disabilities and private school attendance.

Table 24

Association Between Disability and FLS Numeracy Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD			PAK			GHA		
Disabilities	0.80*	0.79**	0.57***	0.74**	0.89	0.77	0.60**	0.71	0.73
	(0.092)	(0.072)	(0.087)	(0.076)	(0.073)	(0.123)	(0.115)	(0.134)	(0.292)
Disabilities * male	0.89			1.35*			1.33		
	(0.146)			(0.182)			(0.350)		
Disabilities * urban		0.74			0.98			0.98	
		(0.159)			(0.135)			(0.262)	
Disabilities * poor			1.57			1.31			0.78
			(0.362)			(0.271)			(0.418)
Disabilities * middle			1.52			1.03			1.11
			(0.355)			(0.225)			(0.573)
Disabilities * rich			1.54			1.03			1.07
			(0.374)			(0.221)			(0.519)
Disabilities * richest			1.05			1.34			0.85
			(0.263)			(0.297)			(0.444)
Observations	21,935	21,935	21,935	15,829	15,829	15,829	5,288	5,288	5,288

Note. The following variables are controlled for: age of a child, age squared, boys, HH head as parent, HH head as grandparent, male-headed HH, # of children in household, wealth index, language minority, religious minority (except for Pakistan), urban, and mothers' education at secondary or above.

* Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level

Table 25

Association Between Disability and FLS Reading Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD			PAK			GHA		
Disabilities	0.66***	0.59***	0.44***	0.70***	0.77***	0.70*	0.41***	0.60	0.71
	(0.074)	(0.055)	(0.067)	(0.064)	(0.056)	(0.102)	(0.106)	(0.171)	(0.288)
Disabilities * male	0.78			1.09			1.98*		
	(0.123)			(0.135)			(0.663)		
Disabilities * urban		0.89			0.89			0.98	
		(0.195)			(0.116)			(0.370)	
Disabilities * poor			1.24			1.04			1.40
			(0.298)			(0.194)			(0.776)
Disabilities * middle			1.99**			1.14			0.77
			(0.470)			(0.222)			(0.427)
Disabilities * rich			1.33			1.25			0.80
			(0.348)			(0.243)			(0.423)
Disabilities * richest			1.24			0.83			0.61
			(0.360)			(0.176)			(0.324)
Observations	21,935	21,935	21,935	15,829	15,829	15,829	5,288	5,288	5,288

Note. The following variables are controlled for: age of a child, age squared, boys, HH head as parent, HH head as grandparent, male-headed HH, # of children in household, wealth index, language minority, religious minority (except for Pakistan), urban, and mothers' education at secondary or above.

* Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level

Table 26

Average Marginal Effect of Disability by Sex, Wealth, Location on FLS Numeracy and Reading, by Country

	Numeracy			Reading		
	BGD	PAK	GHA	BGD	PAK	GHA
Sex of a child						
Average marginal effect of disabilities within boys	–0.083	**–0.008**	–0.060	–0.154	–0.061	**–0.051**
Average marginal effect of disabilities within girls	–0.095	**–0.044**	–0.105	–0.125	–0.074	**–0.132**
Location						
Average marginal effect of disabilities within rural	–0.081	–0.020	–0.050	–0.140	–0.056	**–0.046**
Average marginal effect of disabilities within urban	–0.121	–0.034	–0.118	–0.137	–0.096	**–0.141**
Wealth						
Average marginal effect of disabilities within poorest	–0.111	–0.028	–0.029	–0.164	–0.051	–0.011
Average marginal effect of disabilities within poor	–0.076	–0.005	–0.099	–0.175	–0.074	–0.021
Average marginal effect of disabilities within middle	–0.035	–0.047	–0.056	–0.040	–0.075	–0.098
Average marginal effect of disabilities within wealthy	–0.063	–0.046	–0.065	–0.141	–0.054	–0.102
Average marginal effect of disabilities within wealthiest	–0.069	–0.003	–0.143	–0.067	–0.128	–0.203

Note. Each value indicates the average marginal effect of disabilities in the given education outcome within a specific category. Except wealth, the bold letter indicates the second difference is statistically significant at the 5% level, and the associations are modified by category. Regarding wealth, the second difference between the following pairs are statistically significant at 5% level:
Bangladesh (numeracy): poorest-middle,
Bangladesh (reading): poorest-middle, poorest-wealthiest, poor-middle, poor-wealthiest,
Pakistan (numeracy): no,
Pakistan (reading): poorest-wealthiest,
Ghana (numeracy): no, and
Ghana (reading): poorest-middle, poorest-wealthy, poorest-wealthiest, poor-wealthiest.

Regarding FLS numeracy (Table 24), the interaction terms of the sex of a child are significant only in Pakistan, which is also true in the second difference. Being a girl exacerbates the association between disabilities and numeracy skills in Pakistan. However, in Bangladesh and Ghana, the sex of a child does not moderate the association. Regarding household location, both the interaction terms and second differences identify that it does not moderate the association between disabilities and numeracy skills. Regarding household wealth, it also does not moderate the association in all three countries.

Regarding FLS reading (Table 25), the interaction terms of the sex of a child are significant only in Ghana, as is also supported by the second difference. While in Ghana, being a girl exacerbates the association between disabilities and numeracy skills, the sex of a child does not moderate the association in Bangladesh and Pakistan. Regarding household location, the second difference indicates that it moderates the association only in Ghana, and urban residency exacerbates the association. Regarding household wealth, significant differences emerge between the poorest/poor households and middle/wealthiest households in Bangladesh, and poverty exacerbates the association between disabilities and reading skills. In Pakistan, wealth does not moderate the association. Significant differences exist between the poorest households and middle, wealthy, and wealthiest households in Ghana. Such a difference exists between the poor and wealthiest households. Opposite to the case of Bangladesh, wealth seems to exacerbate the association in Ghana.

Are Associations Between Disability and Educational Outcomes Modified by Factors Predicted by the Medical Model of Disability – Type of Disabilities?

In this subsection, I analyze associations between disabilities and schooling/learning by the type of disabilities.

Table 27
Association Between Type of Disabilities and School Attendance/Entrance (Medical Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	School attendance			School entrance		
	BGD	PAK	GHA	BGD	PAK	GHA
WG-SS	0.81	0.62***	1.07	0.78	0.72*	0.66
	(0.135)	(0.083)	(0.349)	(0.121)	(0.092)	(0.190)
Non-WG-SS	0.85	0.90*	0.94	1.10	0.90*	0.69*
	(0.078)	(0.048)	(0.189)	(0.076)	(0.046)	(0.107)
Having both types	0.15***	0.16***	0.37***	0.24***	0.38***	0.50*
	(0.018)	(0.021)	(0.101)	(0.042)	(0.055)	(0.161)
Age of child	3.51***	3.30***	5.83***	2.21***	1.43***	1.31*
Age squared	0.94***	0.94***	0.92***	0.98***	0.98***	0.98***
Male	0.49***	1.29***	1.11	0.75***	1.27***	1.01
HH head is parent	4.24***	1.29**	2.36***	2.42***	0.97	2.29***
HH head is grandparent	5.20***	1.69***	1.73*	2.57***	1.31**	1.82**
Male-headed HH	1.07	1.11	0.98	1.10*	0.86**	0.88
# of children in household	0.83***	0.94***	0.94*	0.89***	0.94***	0.94*
Urban	0.70***	0.71***	1.02	0.96	0.89*	1.32*
Language minority	0.99	0.68***	0.75	1.22	0.90*	1.00
Poor	1.28***	2.98***	2.86***	1.30***	3.14***	2.19**
Middle	1.64***	5.23***	3.35***	1.64***	5.66***	4.34***
Rich	1.80***	7.75***	3.55***	2.00***	10.25***	7.36***
Richest	2.92***	13.54***	4.27***	3.27***	24.42***	14.95***
Religious minority	1.68***		0.62**	1.32***		0.59***

Table 27 (cont'd)

Mothers' education at secondary or above	2.39***	2.50***	2.19**	1.63***	1.95***	1.47**
Observations	35,930	28,898	7,545	35,930	28,898	7,545

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 28
Predicted Probabilities of Association Between Type of Disability and School Attendance/Entrance (Medical Model), by Country, Age 5–17

	Current school attendance			School entrance		
	BGD	PAK	GHA	BGD	PAK	GHA
No disability	0.83	0.75	0.90	0.96	0.87	0.95
WG-SS	0.81	0.68	0.91	0.95	0.82	0.95
Non-WG-SS	0.82	0.73	0.90	0.95	0.87	0.95
Having both types	0.53	0.44	0.80	0.72	0.56	0.89

Table 27 analyzes the associations between types of disabilities and school attendance/entrance, and Table 28 displays predicted probabilities whose value of covariates are as observed. The associations between disabilities and control variables have already been discussed in the previous section, so I focus on the new results here.

In Bangladesh and Ghana, neither disability listed nor those not listed in the short survey are associated with school attendance. However, among children who have both types of disabilities, disabilities are significantly negatively associated with school attendance. While about half of children who have both types of disabilities are likely to attend school in Bangladesh, 80% of them in Ghana are likely to attend school. Contrarily, both disabilities listed (0.1% level of significance) and not listed (5% level of significance) in the short survey are negatively associated with school attendance in Pakistan. However, as is the case of Bangladesh and Ghana, having both types of disabilities is significantly negatively associated with school attendance.

The three countries differ in their association between the type of disabilities and school entrance. In Bangladesh, having only both types of disabilities is negatively associated with school entrance. In Ghana, having both types of disabilities is also negatively associated with school entrance, but disabilities not listed in the short survey are also negatively associated with school entrance. However, based on predicted probabilities, coefficients, and standard errors, such associations seem to happen because of more precise estimation of the disabilities not listed in the short survey, and the association might be similar between disabilities listed and not listed in the short survey. In Pakistan, as is the case of school attendance, both disabilities listed and those not listed in the short survey are significantly negatively associated with school entrance, and having both types of disabilities presents a more significant negative association.

Table 29
Association Between Type of Disability and Grade Attainment/Private School Attendance (Medical Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	Grade attainment			Private school attendance		
	BGD	PAK	GHA	BGD	PAK	GHA
WG-SS	–0.18	–0.21	0.00	0.78	0.58**	0.96
	(0.097)	(0.162)	(0.192)	(0.188)	(0.102)	(0.400)
Non-WG-SS	0.06	–0.04	–0.10	0.83	0.96	0.97
	(0.057)	(0.048)	(0.101)	(0.134)	(0.071)	(0.263)
Having both types	–2.05***	–1.47***	–0.58*	0.07***	0.09***	0.32*
	(0.132)	(0.128)	(0.243)	(0.010)	(0.013)	(0.182)
Age of child	0.96***	1.40***	1.38***	7.77***	3.38***	7.40***
Age squared	–0.01***	–0.04***	–0.04***	0.92***	0.95***	0.92***
Male	–0.60***	0.21***	–0.08	0.65***	1.75***	0.91
HH head is parent	0.59***	0.23**	0.56***	1.43*	1.30*	2.24*
HH head is grandparent	0.59***	0.26**	0.48***	1.54*	1.55***	1.46
Male-headed HH	0.09*	–0.04	–0.05	1.11	1.10	0.81
# of children in household	–0.17***	–0.07***	–0.03	0.79***	0.93***	0.91*

Table 29 (cont'd)

Urban	–0.27***	–0.26***	–0.09	0.72*	0.74***	2.09*
Language minority	–0.10	–0.26***	0.03	0.93	0.53***	0.62
Poor	0.29***	1.14***	0.74***	1.33**	3.84***	3.84***
Middle	0.53***	1.65***	0.76***	1.71***	7.64***	3.84***
Rich	0.55***	1.90***	1.00***	1.81***	10.55***	9.89***
Richest	0.87***	1.96***	1.09***	2.78***	22.17***	5.73***
Religious minority	0.34***		–0.35***	1.16		0.51***
Mothers' education at secondary or above	0.70***	0.27***	0.17	2.29***	2.80***	6.66*
Constant						
Observations	35,930	28,898	7,545	35,930	28,898	7,545

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 30

Predicted Probabilities of Association Between Type of Disability and Grade Attainment/Private School Attendance (Medical Model), by Country, Age 5–17

	Grade attainment			Private school attendance		
	BGD	PAK	GHA	BGD	PAK	GHA
No disabilities	5.2	4.0	4.3	0.37	0.29	0.22
WG-SS	5.0	3.8	4.3	0.33	0.24	0.17
Non-WG-SS	5.2	4.0	4.2	0.39	0.27	0.17
Having both types	3.1	2.6	3.7	0.15	0.16	0.14

Table 29 analyzes the associations between types of disabilities and educational attainment and private school attendance, and Table 30 displays predicted probabilities whose value of covariates takes as observed.

Regarding school attainment, while neither disabilities listed nor not listed in the short survey are significantly associated with school attainment, having both types of disabilities presents a significant negative association with school attainment in all the three countries. Regarding private school attendance, neither disabilities listed nor not listed in the short survey are significantly associated with private school attendance in Bangladesh and Ghana. However, in Pakistan, while disabilities not listed in the short survey show no significant association,

disabilities listed in the short survey are significantly negatively associated with private school attendance. Having both types of disabilities present significant negative association even in Pakistan.

Table 31
Association Between Type of Disability and FLS Numeracy (Medical Model), Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD		PAK		GHA	
	(1)	(2)	(3)	(4)	(5)	(6)
WG-SS	0.67*	0.72	0.77	0.76	0.60	0.65
	(0.128)	(0.143)	(0.159)	(0.156)	(0.184)	(0.193)
Non-WG-SS	0.92	0.86	0.94	0.95	0.74*	0.78
	(0.081)	(0.082)	(0.066)	(0.067)	(0.104)	(0.124)
Having both types	0.22***	0.33***	0.29***	0.36***	0.34*	0.44*
	(0.063)	(0.094)	(0.084)	(0.106)	(0.144)	(0.171)
Age of child	4.45***	3.28***	2.85***	2.49***	3.01***	2.30**
Age squared	0.95***	0.95***	0.96***	0.97***	0.96**	0.96**
Male	0.86***	1.04	1.18**	1.13*	1.20	1.27
HH head is parent	1.20	1.06	0.88	0.85	1.84***	1.33
HH head is grandparent	1.19	1.04	0.87	0.84	1.32	1.04
Male-headed HH	1.08	1.05	0.92	0.90	1.03	1.04
# of children in household	0.88***	0.91***	0.96*	0.97*	0.93*	0.96
Urban	0.94	1.02	1.20**	1.23**	1.31	1.23
Language minority	0.88	0.87	1.31***	1.38***	0.74*	0.80
Poor	1.27***	1.18**	1.91***	1.55***	1.59*	1.23
Middle	1.40***	1.21**	2.00***	1.52***	1.62*	1.11
Rich	1.59***	1.38***	2.08***	1.52***	2.40***	1.40
Richest	2.51***	1.97***	2.17***	1.57***	3.78***	1.76*
Religious minority	1.10	0.97			0.81	0.95
Mothers' education at secondary or above	1.83***	1.43***	1.63***	1.58***	1.52**	1.29

Table 31 (cont'd)

School attendance		1.25*		3.82***		3.30*
Private school attendance		1.27***		1.03		1.99***
Educational attainment		1.44***				1.50***
Observations	21,935	21,935	15,829	15,829	5,288	5,288

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 32

Association Between Type of Disability and FLS Reading (Medical Model), Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD		PAK		GHA	
	(1)	(2)	(3)	(4)	(5)	(6)
WG-SS	0.58**	0.63*	0.69*	0.67*	0.74	0.87
	(0.107)	(0.127)	(0.123)	(0.127)	(0.251)	(0.324)
Non-WG-SS	0.72***	0.63***	0.79***	0.79***	0.61*	0.62*
	(0.059)	(0.060)	(0.050)	(0.053)	(0.120)	(0.134)
Having both types	0.21***	0.35***	0.23***	0.32***	0.23*	0.31*
	(0.054)	(0.097)	(0.049)	(0.074)	(0.140)	(0.157)
Age of child	5.07***	3.08***	5.24***	3.55***	4.11***	2.96***
Age squared	0.95***	0.95***	0.94***	0.96***	0.95***	0.95***
Male	0.68***	0.89**	0.90*	0.79***	0.97	1.05
HH head is parent	1.18	0.99	1.13	1.10	2.78***	1.85**
HH head is grandparent	1.27	1.04	1.21	1.14	2.35**	1.75
Male-headed HH	1.09	1.05	0.91	0.87	0.91	0.88
# of children in household	0.83***	0.87***	0.96**	0.97	0.90**	0.93
Urban	1.01	1.15*	0.91	0.94	1.88***	1.88***
Language minority	1.04	1.06	1.09	1.24***	1.24	1.48**
Poor	1.28***	1.16*	2.35***	1.68***	2.06**	1.53
Middle	1.54***	1.28***	3.40***	2.20***	3.87***	2.55***
Rich	1.68***	1.42***	4.12***	2.48***	4.74***	2.33***
Richest	2.72***	2.02***	5.79***	3.48***	12.27***	4.56***
Religious minority	1.21**	1.03			0.52***	0.62**

Table 32 (cont'd)

Mothers' education at secondary or above	2.10***	1.51***	1.86***	1.80***	2.22***	1.87***
School attendance		1.68***		29.22***		1.12
Private school attendance		1.29***		1.07		3.06***
Educational attainment		1.72***				1.93***
Observations	21,935	21,935	15,829	15,829	5,288	5,288

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 33

Predicted Probabilities of Association Between Type of Disability and FLS Numeracy/Reading (Medical Model), by Country, Age 7–14

	Numeracy			Reading		
	BGD	PAK	GHA	BGD	PAK	GHA
No disabilities	0.40	0.20	0.28	0.50	0.40	0.23
WG-SS	0.34	0.16	0.21	0.43	0.33	0.22
NonWG-SS	0.37	0.19	0.24	0.43	0.36	0.19
Having both	0.22	0.09	0.16	0.33	0.22	0.13

Note. Predicted probabilities of numeracy and reading are based on the models that consider schooling status.

Tables 31 and 32 analyze the associations between types of disabilities and learning (numeracy and reading, respectively). While Models 1, 3, and 5 in each table do not consider differences in schooling status, such as current school attendance, grade attainment, and private school attendance, Models 2, 4, and 6 account for such factors. Table 36 displays predicted probabilities whose value of covariates are as observed. In numeracy, while disabilities listed in the short survey display a significant negative association in Bangladesh, disabilities not listed in the short survey are significantly negatively associated with numeracy in Ghana. In Pakistan, neither type is significantly associated with numeracy. However, after controlling for schooling status, neither those disabilities listed nor not listed in the short survey are significantly associated

with numeracy in all three countries. In all the three countries, both before and after accounting for schooling status, having both types of disabilities is significantly negatively associated with numeracy. The size of the associations shrinks after accounting for schooling status. Thus, a part of the negative associations between disabilities and numeracy comes from their disadvantaged schooling status.

Associations between disabilities and reading appear different from those between disabilities and numeracy. In Bangladesh and Pakistan, all types of disabilities are significantly negatively associated with reading skills both before and after accounting for schooling status. In Ghana, while disabilities listed in the short survey are not significantly associated with reading skills, disabilities not listed in the short survey and having both types display a significant negative association. However, as is the case of numeracy skills, some of the negative association comes from the disadvantaged schooling status of children with disabilities.

Are Associations Between Disability and Educational Outcomes Modified by Factors Predicted by the Medical Model of Disability – Severity of Disabilities?

In this subsection, I analyze associations between disabilities and schooling/learning by the severity of disabilities.

Table 34

Association Between Severity of Disability and School Attendance/Entrance (Medical Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	School attendance			School entrance		
	BGD	PAK	GHA	BGD	PAK	GHA
Mild disabilities	1.080	1.086	1.148	1.066*	0.961	1.144
	(0.050)	(0.046)	(0.181)	(0.034)	(0.040)	(0.140)
Moderate disabilities	0.741***	0.898	1.004	0.954	0.857**	0.752
	(0.057)	(0.051)	(0.208)	(0.062)	(0.048)	(0.127)
Severe disabilities	0.148***	0.217***	0.275***	0.392***	0.387***	0.336*
	(0.022)	(0.028)	(0.088)	(0.068)	(0.055)	(0.153)
Age of child	3.451***	3.332***	5.696***	2.202***	1.430***	1.309*
Age squared	0.942***	0.941***	0.926***	0.975***	0.979***	0.980***
Male	0.485***	1.281***	1.132	0.746***	1.271***	1.007
HH head is parent	4.238***	1.278**	2.373***	2.413***	0.969	2.309***
HH head is grandparent	5.282***	1.676***	1.780*	2.568***	1.309**	1.827**
Male-headed HH	1.084	1.142*	0.974	1.106*	0.860*	0.885
# of children in household	0.828***	0.938***	0.939*	0.889***	0.937***	0.936*
Urban	0.702***	0.703***	1.019	0.950	0.891*	1.312
Language minority	1.017	0.684***	0.737	1.236	0.904*	1.007
Poor	1.285***	2.955***	2.810***	1.308***	3.138***	2.178**
Middle	1.677***	5.224***	3.335***	1.658***	5.660***	4.344***
Rich	1.827***	7.669***	3.364***	2.016***	10.214***	7.308***
Richest	2.977***	13.467***	4.193***	3.317***	24.382***	14.956***
Religious minority	1.665***		0.632**	1.315***		0.593***
Mothers' education at secondary or above	2.393***	2.491***	2.203**	1.632***	1.958***	1.488**
Observations	35,930	28,898	7,545	35,930	28,898	7,545

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 35
Predicted Probabilities of Association Between Severity of Disability and School Attendance/Entrance (Medical Model), by Country, Age 5–17

	Current school attendance			School entrance		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
No disabilities	0.83	0.74	0.89	0.95	0.87	0.94
Mild disabilities	0.84	0.75	0.90	0.96	0.88	0.95
Moderate disabilities	0.79	0.72	0.89	0.94	0.86	0.95
Severe disabilities	0.52	0.49	0.75	0.71	0.62	0.83

Table 34 analyzes the associations between severity of disabilities and school attendance and entrance, and Table 35 provides predicted probabilities whose value of covariates take as observed. Recall that the reference group of this subsection differs from that of the previous sections. The previous sections follow the UNICEF and WGDS's disability definition, under which mild disabilities are regarded as not being disabilities. However, in this subsection, mild disabilities are analyzed as a separate category to see their associations with schooling and learning. Thus, while the classification no disabilities in the previous sections includes mild disabilities, in this subsection it does not.

Regarding school attendance, mild disabilities do not show a significant association across all three countries. However, moderate disabilities are negatively associated with school attendance, but only in Bangladesh. Severe disabilities are significantly negatively associated with school attendance in three countries.

Regarding school entrance, mild disabilities are not negatively associated with school entrance. Rather, mild disabilities have a positive association in Bangladesh. Moderate disabilities are negatively associated with school entrance in Pakistan, but they are not in Bangladesh and Ghana. Severe disabilities are significantly negatively associated with school entrance across three countries, but the association is smaller in Ghana than in Bangladesh and Pakistan, consistent with school attendance.

Table 36

Association Between Severity of Disability and Grade Attainment/Private School Attendance (Medical Model), Logit Odds Ratio Analysis, by Country, Age 5–17

	Grade attainment			Private school attendance		
	BGD	PAK	GHA	BGD	PAK	GHA
Mild disabilities	0.05	0.01	0.01	1.084	1.155*	1.227
	(0.027)	(0.037)	(0.086)	(0.096)	(0.067)	(0.290)
Moderate disabilities	–.17**	–.06	–.10	0.657**	0.953	1.174
	(0.053)	(0.052)	(0.111)	(0.084)	(0.074)	(0.359)
Severe disabilities	–.63***	–.24***	–.07*	0.065***	0.144***	0.175**
	(0.163)	(0.127)	(0.490)	(0.012)	(0.020)	(0.094)
Age of child	0.95***	1.41***	1.37***	7.451***	3.409***	7.140***
Age squared	–.01***	–.04***	–.04***	0.922***	0.950***	0.925***
Male	–.61***	0.20***	–.08	0.647***	1.708***	0.945
HH head is parent	0.59***	0.23**	0.57***	1.446*	1.278*	2.195*
HH head is grandparent	0.60***	0.26**	0.49***	1.594*	1.539***	1.463
Male-headed HH	0.09*	–.03	–.06	1.152	1.152	0.812
# of children in household	–.17***	–.07***	–.03	0.790***	0.928***	0.912*
Urban	–.27***	–.26***	–.10	0.729*	0.726***	1.999*
Language minority	–.08	–.26***	0.03	0.986	0.533***	0.571*
Poor	0.30***	1.14***	0.73***	1.342**	3.785***	3.777***
Middle	0.55***	1.65***	0.76***	1.815***	7.566***	3.984***
Rich	0.56***	1.89***	0.99***	1.883***	10.243***	9.037***
Richest	0.89***	1.96***	1.09***	2.890***	21.954***	5.620***
Religious minority	0.33***		–.35***	1.126		0.530***
Mothers' education at secondary or above	0.70***	0.27***	0.18	2.309***	2.728***	6.795*
Observations	35,930	28,898	7,545	35,930	28,898	7,545

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 37
Predicted Probabilities of Association Between Severity of Disability and Grade Attainment/Private School Attendance (Medical Model), by Country, Age 5–17

	Grade attainment			Private school attendance		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
No disabilities	5.1	4.0	4.3	0.37	0.29	0.20
Mild disabilities	5.2	4.0	4.3	0.38	0.28	0.22
Moderate disabilities	5.0	4.0	4.2	0.36	0.27	0.17
Severe disabilities	3.5	2.8	3.2	0.20	0.16	0.09

Table 36 analyzes the associations between severity of disabilities and school attendance and entrance, and Table 37 provides predicted probabilities whose value of covariates takes as observed. The associations between severity of disabilities and school attainment/private school attendance are almost the same as school attendance. Mild disabilities are not negatively associated with school attainment and private school attendance in all three countries, but moderate disabilities are only in Bangladesh. Severe disabilities are also significantly negatively associated with school attainment and private school attendance in all three countries.

Table 38
Association Between Severity of Disabilities and FLS Numeracy (Medical Model), Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD		PAK		GHA	
	(1)	(2)	(3)	(4)	(5)	(6)
Mild disabilities	0.947	0.920*	0.966	0.959	0.862	0.864
	(0.038)	(0.038)	(0.052)	(0.053)	(0.108)	(0.116)
Moderate	0.749***	0.749**	0.873	0.873	0.587***	0.640**
disabilities	(0.063)	(0.066)	(0.066)	(0.067)	(0.088)	(0.102)
Severe disabilities	0.462***	0.549*	0.596*	0.718	0.293*	0.374
	(0.107)	(0.131)	(0.120)	(0.146)	(0.167)	(0.200)
Age of child	4.400***	3.241***	2.854***	2.492***	2.951***	2.258**
Age squared	0.949***	0.948***	0.962***	0.970***	0.965**	0.964**
Male	0.857***	1.041	1.175**	1.126*	1.185	1.260
HH head is parent	1.200	1.062	0.881	0.858	1.877***	1.345

Table 38 (cont'd)

HH head is grandparent	1.197	1.040	0.878	0.843	1.327	1.045
Male-headed HH	1.076	1.051	0.924	0.904	1.023	1.027
# of children in household	0.878***	0.916***	0.964*	0.970*	0.931*	0.959
Urban	0.943	1.024	1.198**	1.223**	1.303	1.229
Language minority	0.879	0.870	1.312***	1.386***	0.748*	0.804
Poor	1.270***	1.177**	1.907***	1.550***	1.589*	1.236
Middle	1.406***	1.212**	2.001***	1.526***	1.618*	1.112
Rich	1.594***	1.379***	2.075***	1.524***	2.412***	1.406
Richest	2.516***	1.962***	2.168***	1.571***	3.816***	1.783*
Religious minority	1.091	0.963			0.811	0.958
Mothers' education at secondary or above	1.835***	1.425***	1.635***	1.580***	1.527**	1.292
School attendance		1.248*		3.859***		3.397*
Private school attendance		1.278***		1.024		1.992***
Educational attainment		1.450***				1.502***
Observations	21,935	21,935	15,829	15,829	5,288	5,288

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 39

Association Between Type of Disability and FLS Reading (Medical Model), Logit Odds Ratio Analysis, by Country, Age 7–14

	BGD		PAK		GHA	
	(1)	(2)	(3)	(4)	(5)	(6)
Mild disabilities	0.905*	0.861**	0.894*	0.864**	0.865	0.876
	(0.039)	(0.040)	(0.042)	(0.044)	(0.129)	(0.139)
Moderate disabilities	0.570***	0.544***	0.708***	0.686***	0.501***	0.548**
	(0.047)	(0.050)	(0.047)	(0.049)	(0.103)	(0.122)
Severe disabilities	0.445***	0.564*	0.426***	0.575**	0.167**	0.251*
	(0.106)	(0.128)	(0.079)	(0.117)	(0.114)	(0.154)
Age of child	5.021***	3.055***	5.237***	3.558***	3.969***	2.848***

Table 39 (cont'd)

Age squared	0.946***	0.949***	0.939***	0.960***	0.956***	0.952***
Male	0.684***	0.889**	0.896*	0.793***	0.963	1.042
HH head is parent	1.179	0.984	1.132	1.094	2.852***	1.859**
HH head is grandparent	1.282	1.043	1.215	1.139	2.374**	1.755
Male-headed HH	1.085	1.052	0.914	0.863	0.903	0.871
# of children in household	0.830***	0.871***	0.965**	0.975	0.897**	0.926
Urban	1.011	1.164*	0.911	0.940	1.871***	1.876***
Language minority	1.033	1.049	1.091	1.247***	1.256	1.486**
Poor	1.272***	1.149*	2.352***	1.684***	2.071**	1.539
Middle	1.544***	1.279***	3.405***	2.214***	3.868***	2.553***
Rich	1.679***	1.416***	4.109***	2.482***	4.787***	2.369***
Richest	2.718***	2.007***	5.778***	3.490***	12.372***	4.638***
Religious minority	1.203*	1.019			0.525***	0.624*
Mothers' education at secondary or above	2.105***	1.501***	1.871***	1.802***	2.227***	1.842***
School attendance		1.681***		29.595***		1.169
Private school attendance		1.296***		1.066		3.047***
Educational attainment		1.725***				1.936***
Observations	21,935	21,935	15,829	15,829	5,288	5,288

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 40

Predicted Probabilities of Association Between Severity of Disability and FLS Numeracy/Reading (Medical Model), by Country, Age 7–14

	Numeracy			Reading		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
No disabilities	0.41	0.21	0.29	0.52	0.42	0.25
Mild disabilities	0.39	0.20	0.27	0.49	0.39	0.23
Moderate disabilities	0.35	0.19	0.23	0.41	0.35	0.18
Severe disabilities	0.30	0.16	0.16	0.42	0.32	0.12

Note. Predicted probabilities of numeracy and reading are based on the models that consider schooling status.

Tables 38 and 39 analyze the associations between severity of disabilities and learning (numeracy and reading, respectively). While Models 1, 3, and 5 in each table do not consider differences in schooling status, such as current school attendance, grade attainment, and private school attendance, Models 2, 4, and 6 account for such factors. Table 40 displays predicted probabilities whose value of covariates take as observed.

Regarding numeracy, mild disabilities show only a significant negative association in Bangladesh after controlling for schooling status. While moderate disabilities are significantly negatively associated with numeracy skills in Bangladesh and Ghana both before and after controlling for schooling status, it is not in Pakistan. Severe disabilities are significantly negatively associated with numeracy skills before accounting for schooling status, and such an association disappears in Pakistan and Ghana after accounting for schooling status. In these two countries, severe disabilities are significantly negatively associated with schooling, and it seems to lead to the associations between severe disabilities and numeracy skills. In other words, severe disabilities are significantly negatively associated with numeracy skills only via their disadvantaged schooling status.

Regarding reading skills, mild disabilities show a significant negative association in Bangladesh and Pakistan even after controlling for schooling status, but not in Ghana. However, both moderate and severe disabilities are significantly negatively associated with reading skills both before and after controlling schooling status in all three countries.

Predicted probabilities for the schooling and learning of children having both types of disabilities and severe disabilities are especially low compared to various predicted probabilities discussed in the previous chapter. Regarding school attendance, there is no category of children whose predicted probabilities is lower than children having both types and severe disabilities. The

same is almost true for school entrance, and only children from the poorest household in Ghana show the lower predicted probability than children having both types of disability.

However, grade attainment differs slightly. For instance, children from the poorest households in Pakistan display lower predicted probabilities than do children having both types and severe disabilities. In Ghana, children from the poorest households show the lower predicted probabilities than children having both types of disability. Regarding private school attendance, in both Pakistan and Ghana, children from the poorest households have lower predicted probability than those having both types and severe disabilities. Furthermore, in Ghana, children from rural areas have lower predicted probabilities than do children having both types of disability.

Regarding learning, children from the poorest households tend to have the lowest predicted probabilities. In numeracy, children from the poorest households have lower predicted probability than do children with severe disabilities in all three countries. In Ghana, such children have lower predicated probability than children having both types of disabilities, too. Similarly, in reading, children from the poorest household have lower predicted probability than do children having both types and severe disabilities in Pakistan and Ghana. In Bangladesh, children from the poorest household have lower predicted probability than do children with severe disabilities.

Summary of Chapter 6

The tables below summarize the results of this chapter.

Table 41
Association Between Disability and Educational Outcomes Using Social Model of Disability: Summary of Results

	BGD	PAK	GHA
Interactions - attendance			
Boys (the sex of a child)	NS	NS	NS
Urban (location)	NS	NS	–
Wealth	+	+	NS
Interactions – entrance			
Boys (the sex of a child)	NS	NS	NS
Urban (location)	NS	NS	NS
Wealth	+	+	NS
Interactions – attainment			
Boys (the sex of a child)	NS	NS	NS
Urban (location)	NS	NS	–
Wealth	+	NS	NS
Interactions – private school attendance			
Boys (the sex of a child)	NS	+	NS
Urban (location)	NS	NS	–
Wealth	NS	NS	NS
Interactions – numeracy			
Boys (the sex of a child)	NS	+	NS
Urban (location)	NS	NS	NS
Wealth	NS	NS	NS
Interactions – reading			
Boys (the sex of a child)	NS	NS	+
Urban (location)	NS	NS	–
Wealth	+	NS	–

Note. – indicates a statistically significant negative association, + indicates the positive association, and NS means there is no statistically significant association.

Regarding the influence of socioeconomic and demographic factors on the association between disabilities and schooling/learning, only wealth seems to modify the association in Bangladesh. Wealth mitigates all associations except private school attendance and numeracy

skills. In Pakistan, wealth seems to mitigate the associations between disabilities and some aspects of schooling, but not in learning. In addition, being a boy mitigates the association between disabilities and private school attendance/numeracy skills. In Ghana, urban residency worsens the associations between disabilities and schooling. However, nothing modifies the association between disabilities and numeracy. Contrary to numeracy, the association between disabilities and reading skills is modified by various factors. For instance, being a boy mitigates the association, while urban residency and wealth exacerbate the association.

Table 42
Association Between Disability and Educational Outcomes Using Medical Model of Disability – Type of Disability: Summary of Results

	BGD	PAK	GHA
Attendance			
WG-SS	NS	–	NS
Non-WG-SS	NS	–	NS
Having both types	–	–	–
Entrance			
WG-SS	NS	–	NS
Non-WG-SS	NS	–	–
Having both types	–	–	–
Attainment			
WG-SS	NS	NS	NS
Non-WG-SS	NS	NS	NS
Having both types	–	–	–
Private School			
WG-SS	NS	–	NS
Non-WG-SS	NS	NS	NS
Having both types	–	–	–
Numeracy without schooling			
WG-SS	–	NS	NS

Table 42 (cont'd)

Non-WG-SS	NS	NS	–
Having both types	–	–	NS
Numeracy with schooling			
WG-SS	NS	NS	NS
Non-WG-SS	NS	NS	NS
Having both types	–	–	–
Reading without schooling			
WG-SS	–	–	NS
Non-WG-SS	–	–	–
Having both types	–	–	–
Reading with schooling			
WG-SS	–	–	NS
Non-WG-SS	–	–	–
Having both types	–	–	–

In Bangladesh, the association between disabilities and schooling seems to concentrate on those who have both types of disability, which is also true in numeracy FLS acquisition. However, all types of disability are significantly negatively associated with reading FLS acquisition. In Pakistan, as is the case of Bangladesh, having both types of disability is significantly negatively associated with all aspects of schooling and learning. However, both disabilities listed and not listed in the short survey are also significantly negatively associated with school attendance and entrance, diverging from the case of Bangladesh. As with Bangladesh and Pakistan, in Ghana having both types of disability is significantly negatively associated with all aspects of schooling and learning. However, the disabilities listed in the short survey are not significantly associated with all aspects of schooling and learning, including reading FLS acquisition, marking a difference from the cases of Bangladesh and Pakistan.

Table 43
Association Between Disability and Educational Outcomes Using Medical Model of Disability – Severity of Disability: Summary of Results

	BGD	PAK	GHA
Attendance			
Mild disabilities	NS	NS	NS
Moderate disabilities	-	NS	NS
Severe disabilities	-	-	-
Entrance			
Mild disabilities	+	NS	NS
Moderate disabilities	NS	-	NS
Severe disabilities	-	-	-
Attainment			
Mild disabilities	NS	NS	NS
Moderate disabilities	-	NS	NS
Severe disabilities	-	-	-
Private School			
Mild disabilities	NS	+	NS
Moderate disabilities	-	NS	NS
Severe disabilities	-	-	-
Numeracy without schooling			
Mild disabilities	NS	NS	NS
Moderate disabilities	-	NS	-
Severe disabilities	-	-	-
Numeracy with schooling			
Mild disabilities	-	NS	NS
Moderate disabilities	-	NS	-
Severe disabilities	-	NS	NS
Reading without schooling			
Mild disabilities	-	-	NS
Moderate disabilities	-	-	-
Severe disabilities	-	-	-
Reading with schooling			

Table 43 (cont'd)

Mild disabilities	-	-	NS
Moderate disabilities	-	-	-
Severe disabilities	-	-	-

In Bangladesh, while mild disabilities are significantly negatively associated with learning, this association does not hold with schooling. Moderate disabilities are significantly negatively associated with all aspects of schooling and learning, except school entrance. Severe disabilities exhibit significant negative associations with all aspects of schooling and learning.

In Pakistan, mild disabilities are not significantly negatively associated with schooling. Learning is significantly negatively associated with reading, but not with numeracy. Moderate and severe disabilities are also significantly negatively associated with reading, but not with numeracy. Moderate disabilities are not significantly associated with schooling, except school entrance, and severe disabilities are significantly negatively associated with all aspects of schooling.

In Ghana, mild disabilities are not significantly associated with schooling and learning. While moderate disabilities are significantly negatively associated with learning, this outcome does not hold for schooling. Severe disabilities are significantly negatively associated with schooling and learning. However, after accounting for their disadvantaged schooling status, such an association disappears in numeracy.

Chapter 7. Preschool Children With Disabilities and Their Access to ECE and Development

This chapter analyzes the associations between disabilities and child development/access to ECE. Firstly, I provide descriptive statistics on dependent, independent, and control variables. I then display the results of my regression analysis regarding the associations between disabilities and access to ECE/child development. Then, I examine whether socioeconomic and demographic factors influence the associations. Finally, I scrutinize whether the associations differ by type and severity of disability. The primary purpose of this chapter is to check whether the associations between disabilities and schooling/learning discussed in the previous two chapters are present even among preschool-age children.

Descriptive Statistics

In this subsection, I provide descriptive statistics on control variables, dependent variables (child development and access to ECE), and independent variables (prevalence of disabilities).

Table 44
Descriptive Statistics on Key Control Variables of Children Age 3 and 4

	Bangladesh	Pakistan	Ghana
Age (in months)	47.22	46.90	47.14
Male	52.0%	51.0%	49.0%
HH head is parent	76.0%	63.0%	73.0%
HH head is grandparent	21.0%	32.0%	22.0%
Percentage of orphan	1.0%	2.0%	4.0%
Male-headed household	90.0%	93.0%	71.0%
Number of children in household	2.4	4.3	4.1
Language minority	1.0%	33.0%	52.0%
Religious minority	8.0%		31.0%
Urban residence	21.0%	34.0%	43.0%
Mother's education at secondary or above	62.0%	25.0%	13.0%
Observations	9,446	15,894	3,650

Table 44 displays descriptive statistics on key control variables using the Stata SVY command to incorporate the survey design with probability weights. The SYV command is also applied to descriptive statistics in the following tables. Children's demographic characteristics, such as age and sex, are similar across the three countries. However, the demographic features of the household differ. For instance, most families in Bangladesh and Pakistan are male-headed households. However, only 71% of households are headed by a males in Ghana. Additionally, the average number of children in a household in Bangladesh (2.4) is much smaller than that of Pakistan (4.3) and Ghana (4.1). Social characteristics also differ significantly. Bangladesh is quite a homogenous society because the percentage of language minority (1%) and religious minority (8%) is quite low. Contrarily, Ghana is a diverse society with a large language (52%) and religious minority (31%) population. The degree of urbanization also varies. Ghana is the most urbanized country (43%), Bangladesh is the least (21%), and Pakistan is an in-between

(34%). In terms of the education level of caregivers, Bangladesh is far more advanced than the other two countries, and 62% of mothers complete secondary education and above.

Table 45
Descriptive Statistics on Child Development and Access to ECE of Children Age 3 and 4 (%)

	Bangladesh	Pakistan	Ghana
Literacy-numeracy	0.29	0.27	0.44
Physical	0.98	0.97	0.93
Socioemotional	0.73	0.52	0.66
Learning	0.91	0.93	0.85
Developmentally on track	0.75	0.59	0.68
Attending early childhood education program	0.19	0.31	0.71
Observations	9,446	15,894	3,650

Table 45 displays descriptive statistics on child development and access to ECE. This part of the study follows the ECDI developed by UNICEF. Using the MICS children under five module, UNICEF collects data on the following four domains of early childhood development from children aged between 36–59 months: literacy-numeracy (cognitive development), physical, socioemotional, and approach to learning. If a child is regarded developmentally on track in at least three domains, ECDI counts them as developmentally on track.

In Bangladesh, 75% of children are developmentally on track, although only 19% of children currently attend ECE. In contrast, 71% of children in Ghana attend ECE. However, only 68% of children are developmentally on track. In Pakistan, only 31% of children attend ECE, and 59% of children are developmentally on track.

Certain common trends appear across all three countries. First, less than half of children are developmentally on track with cognitive development. Even in Ghana, the highest among the three countries, only 43% of children are developmentally on track in this domain. Second, most

children are developmentally on track with physical development and learning approach. Third, child development in the socioemotional dimension has relatively high variation across three countries, as compared to the other three domains.

Table 46
Descriptive Statistics on Child Disabilities of Children Age 3 and 4 (%)

	Bangladesh	Pakistan	Ghana
Disabilities listed in the short survey (WG-SS)			
Seeing	0.001	0.004	0.001
Hearing	0.002	0.003	0.001
Walking	0.004	0.007	0.002
Communication	0.006	0.011	0.010
Total	0.009 (0.003)	0.018 (0.010)	0.012 (0.006)
Disabilities not listed in the short survey (NonWG-SS)			
Fine motor	0.003	0.003	0.006
Learning	0.011	0.010	0.027
Playing	0.004	0.006	0.001
Controlling Behavior	0.013	0.037	0.054
Total	0.024 (0.018)	0.050 (0.042)	0.082 (0.076)
Having both types	0.006	0.008	0.006
Severity of Disabilities			
Mild disabilities	0.485	0.693	0.723
Moderate disabilities	0.022	0.053	0.084
Severe disabilities	0.004	0.007	0.005
Prevalence of disabilities	0.027	0.060	0.088
Observations	9,446	15,894	3,650

Note. Value in parenthesis eliminate children with both short survey and nonWG-SS survey type of disabilities

Table 46 shows descriptive statistics on disabilities by type and severity. Compared to primary and secondary school-age children, the variation in the prevalence of disabilities among

under-5 children across three countries is slight. As is the case of primary and secondary school-age children (Table 29), the prevalence of disabilities is the highest in Ghana (8.8%) and the lowest in Bangladesh (2.7%), even in this age category. Pakistan is in between (6.0%). The variation is small in the prevalence of disabilities listed in the short survey and large in disabilities not listed in the short survey. Specifically, the prevalence of functional difficulty in controlling behavior differs significantly by country (i.e., Ghana – 5.5% and Bangladesh 1.3%). The prevalence of having both types of disabilities is low, and its variation is also small.

Severe disabilities are not prevalent, and variation in the prevalence among countries is small. In other words, the variation in the prevalence of disabilities is mainly driven by the variation in the prevalence of moderate disabilities (i.e., Ghana – 8.4% and Bangladesh – 2.2%). Contrarily, the prevalence of mild disabilities (which are not even regarded as disabilities based on the Washington Group's definition) is high, and the variation is considerable (i.e., Ghana – 72% and Bangladesh – 48%).

Under-5 Children With Disabilities and Their Access to ECE and Development

This subsection analyzes the associations between disabilities and access to ECE/child development.

Table 47

Association Between Disability and Access to ECE/Early Childhood Development, Logit Odds Ratio Analysis, by Country, Age 3 and 4

	Access to ECE			ECDI		
	BGD	PAK	GHA	BGD	PAK	GHA
Disabilities	0.58*	0.68***	1.12	0.20***	0.59***	0.62**
	(0.141)	(0.059)	(0.213)	(0.032)	(0.045)	(0.109)
Age (in months)	1.55***	1.62***	1.23	1.03	1.01	1.21
Age squared	1.00**	1.00***	1.00	1.00	1.00	1.00
Male	1.00	1.01	1.00	0.69***	0.85***	0.68***
HH head is parent	0.75	0.73***	1.02	1.01	0.94	1.17
HH head is grandparent	0.93	0.85	1.57	1.10	0.98	1.04
HH head is male	1.21	0.94	1.11	1.09	1.02	1.04
Number of children in household	0.90***	0.96***	0.90**	0.90***	0.96***	0.95*
Poor	1.01	1.87***	1.97***	1.04	1.36***	1.33*
Middle	1.19	2.37***	3.20***	1.20*	1.49***	1.33*
Rich	1.20	2.81***	3.89***	1.16	1.73***	1.91***
Richest	1.69***	3.56***	8.77***	1.97***	2.34***	3.06***
Language minority	1.11	0.80***	1.20	0.90	0.98	1.54**
Religious minority	1.61		0.78	0.97		1.35
Urban	1.07	0.82**	0.77*	0.84	0.93	0.87
Mother education is secondary or above	1.51***	1.47***	2.20**	1.32***	1.34***	1.94***
Observations	9,446	15,894	3,650	9,446	15,894	3,650

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 48

Predicted Probabilities of Association Between Disability and Access to ECE/Early Childhood Development, by Country, Age 3 and 4

	Access to ECE			ECDI		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
Without disabilities	0.191	0.315	0.712	0.754	0.600	0.688
Disabilities	0.125	0.231	0.737	0.411	0.470	0.578

Table 47 analyzes associations between disabilities and access to ECE and child development among children aged 36–59 months, and Table 48 provides their predicted probabilities whose value of covariates take as observed.

Before discussing the relationship, I would like to describe certain common characteristics in the relationships between ECE access/child development and control variables. First, gender discrimination seems not to exist in access to ECE. However, boys tend to be more developmentally off track than girls in all three countries. Second, children from wealthier households show better access to ECE and child development. Third, children with well-educated mothers show better access to ECE and child development.

The associations between other control variables and ECE access/child development differ by country. First, older children have better access to ECE in Pakistan and Ghana, but the opposite relationship holds in Bangladesh. Interestingly, however, in none of the three countries is the age of a child associated with child development. Second, children with many siblings have less access to ECE in all three countries. However, while more siblings are associated with less child development in Bangladesh and Pakistan, this is not the case in Ghana. Third, minority children have less access to ECE and child development in Pakistan. However, although they have less access to ECE, their development status is not associated with less child development in Ghana. In Bangladesh, being a minority is not associated with less access to ECE or child development. Thus, being a minority seems to have different meanings in the three countries. Fourth, children in urban areas have less access to education, but urban residency is not associated with less child development in Pakistan. Such children in Ghana have similar access to ECE as do children in rural areas, but they display better child development. In Bangladesh, urban/rural residential difference is not associated with access to ECE or child development.

Regarding children with disabilities, as is the case for primary and secondary-school age children, disabilities are significantly negatively associated with access to ECE in Bangladesh and Pakistan, but not in Ghana, and disabilities are significantly negatively associated with ECDI in all three countries.

Are Associations Between Disability and Early Childhood Educational Outcomes Modified With Insights From the Social Model of Disability – Wealth, Sex, and Location?

I examine whether socioeconomic and demographic factors modify the associations between disabilities and access to ECE/child development. In the context that the social model of disability is influential, the background of children with disabilities should modify the associations between disabilities schooling/learning. For instance, girls with disabilities might be more marginalized due to their double burden of gender and disabilities. Children with disabilities in rural areas might also be more marginalized due to the stigma associated with disabilities, which is more prevalent in rural communities. At the same time, the type and severity of disabilities might not be so influential, compared to the background of children. Contrarily, in the context that the medical model of disability is influential, the type and severity of disabilities might be more influential than the background of children with disabilities. Thus, I examine whether the background of children with disabilities influences the associations between disabilities and access to ECE/child development in this subsection, and in the next subsection I then examine whether the type and severity of disabilities modify the associations.

Table 49

Association Between Disability and ECE Access Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 3 and 4

	Bangladesh			Pakistan			Ghana		
Disabilities	0.47	0.40**	0.41	0.61***	0.70***	0.70	1.39	1.00	0.82
	(0.201)	(0.124)	(0.245)	(0.085)	(0.071)	(0.131)	(0.362)	(0.220)	(0.246)
Disabilities * male	1.40			1.21			0.67		
	(0.723)			(0.216)			(0.255)		
Disabilities * urban		2.77			0.89			1.69	
		(1.457)			(0.174)			(0.794)	
Disabilities * poor			1.50			0.90			1.69
			(1.175)			(0.243)			(0.777)
Disabilities * middle			1.33			0.81			2.42
			(1.324)			(0.227)			(1.394)
Disabilities * rich			1.20			1.18			0.71
			(0.985)			(0.301)			(0.466)
Disabilities * richest			1.84			0.96			1.96
			(1.399)			(0.285)			(2.207)
Observations	9446	9446	9446	15894	15894	15894	3650	3650	3650

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 50

Association Between Disability and Early Childhood Development Using Interaction Terms (Social Model), Logit Odds Ratio Analysis, by Country, Age 3 and 4

	Bangladesh			Pakistan			Ghana		
Disabilities	0.18***	0.18***	0.21***	0.57***	0.59***	0.78	0.53**	0.59*	0.55*
	(0.045)	(0.032)	(0.058)	(0.061)	(0.051)	(0.105)	(0.128)	(0.124)	(0.166)

Table 50 (cont'd)

Disabilities * male	1.20			1.07			1.33		
	(0.385)			(0.159)			(0.423)		
Disabilities * urban		1.66			0.99			1.22	
		(0.658)			(0.171)			(0.469)	
Disabilities * poor			1.50			0.69			0.85
			(0.658)			(0.137)			(0.381)
Disabilities * middle			0.85			0.75			1.46
			(0.443)			(0.160)			(0.684)
Disabilities * rich			0.41			0.67			1.30
			(0.215)			(0.151)			(0.649)
Disabilities * richest			1.23			0.60*			1.36
			(0.613)			(0.151)			(0.930)
Observations	9,446	9,446	9,446	15,894	15,894	15,894	3,650	3,650	3,650

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 51

Average Marginal Effect of Disability by Sex, Wealth, Location on ECE Attendance and Early Childhood Development, by Country, Age 3 and 4

	ECE attendance			ECDI		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
Sex of a child						
Average marginal effect of disabilities within boys	–0.037	**–0.060**	0.006	–0.365	–0.117	–0.064
Average marginal effect of disabilities within girls	–0.100	**–0.113**	0.050	–0.322	–0.143	–0.153
Location						
Average marginal effect of disabilities within rural	–0.095	–0.079	0.028	**–0.394**	–0.122	–0.114

Table 51 (cont'd)

Average marginal effect of disabilities within urban	0.007	–0.086	0.076	**–0.209**	–0.130	–0.048
Wealth						
Average marginal effect of disabilities within poorest	–0.074	–0.054	–0.014	–0.362	–0.037	–0.149
Average marginal effect of disabilities within poor	–0.046	–0.078	0.097	–0.284	–0.137	–0.168
Average marginal effect of disabilities within middle	–0.087	–0.113	0.114	–0.376	–0.127	–0.033
Average marginal effect of disabilities within wealthy	–0.094	–0.031	–0.077	–0.523	–0.156	–0.058
Average marginal effect of disabilities within wealthiest	–0.036	–0.098	0.029	–0.214	–0.177	–0.023

Note. Each value indicates the average marginal effect of disabilities in the given education outcome within a specific category. Except wealth, the bold letter indicates the second difference is statistically significant at the 5% level, and the associations are modified by category. Regarding wealth, the second difference between the following pairs are statistically significant at 5% level:
Bangladesh (ECE): no,
Bangladesh (ECDI): poor-wealthy, wealthy-wealthiest,
Pakistan (ECE): no,
Pakistan (ECDI): poorest-wealthy, poorest-wealthiest,
Ghana (ECE): no, and
Ghana (ECDI): no.

Tables 49 and 50 examine whether the associations between disabilities and access to ECE/early childhood development are modified by socioeconomic and demographic factors among children aged 36–59 months. Since the coefficients of controls are more or less similar to the results in Table 47, they are abbreviated here. Table 51 provides decomposed average marginal effects.

Regarding access to ECE, none of the interaction terms are significant. However, only the sex of a child shows a significant difference in the second difference. Being a girl seems to exacerbate the association between disabilities and ECE access in Pakistan. Nearly the same is true for child development. Only the wealthiest in Pakistan show a statistical significance in interaction terms, and the second difference also supports the statistical significance. In Pakistan, the poorest households differ significantly from the wealthy and wealthiest households, and wealth seems to exacerbate the association between disabilities and early childhood development. In addition, the second difference indicates that, in Bangladesh, rural residency seems to exacerbate the association.

Are Associations Between Disability and Early Childhood Educational Outcomes Modified With Insights From the Medical Model of Disability – Type and Severity of Disabilities?

As discussed in the previous subsection, I analyze whether the type and severity of disabilities influence the association between disabilities and access to ECE/child development in this sub-section.

Table 52
Association Between Type/Severity of Disabilities and ECE Attendance (Medical Model), Logit Odds Ratio Analysis, by Country, Age 3 and 4

	Bangladesh	Pakistan	Ghana
Type of disabilities			
Listed in the short survey (WG-SS)	0.85	0.27***	0.62
	(0.542)	(0.074)	(0.322)
Not listed in the short survey (nonWG-SS)	0.75	0.98	1.25
	(0.206)	(0.095)	(0.270)
Having both types	0.09**	0.09***	0.61
	(0.065)	(0.038)	(0.382)
Severity of disabilities			
Mild disabilities	1.14	0.93	0.94
	(0.078)	(0.043)	(0.138)
Moderate disabilities	0.62	0.76**	1.24
	(0.165)	(0.069)	(0.244)
Severe disabilities	0.35	0.07***	0.23*
	(0.236)	(0.038)	(0.171)
Observations	9446	15894	3650

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 53

Association Between Type/Severity of Disabilities and Early Childhood Development (Medical Model), Logit Odds Ratio Analysis, by Country, Age 3 and 4

	Bangladesh	Pakistan	Ghana
Type of disabilities			
WG-SS	0.38*	0.55***	1.86
	(0.171)	(0.093)	(0.870)
Non-WG-SS	0.29***	0.77**	0.60**
	(0.054)	(0.070)	(0.105)
Having both types	0.03***	0.11***	0.35
	(0.013)	(0.027)	(0.271)
Severity of disabilities			
Mild disabilities	0.21***	0.43***	0.40***
	(0.013)	(0.019)	(0.049)
Moderate disabilities	0.17***	0.52***	0.54**
	(0.033)	(0.044)	(0.102)
Severe disabilities	0.10***	0.12***	0.22*
	(0.051)	(0.035)	(0.166)
Observations	9446	15894	3650

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level.

Table 54

Predicted Probabilities of Association Between Type/Severity of Disabilities and ECE Access/Early Childhood Development (Medical Model), by Country, Age 3 and 4

	Access to ECE			ECDI		
	Bangladesh	Pakistan	Ghana	Bangladesh	Pakistan	Ghana
Type of disability						
No disability	0.191	0.313	0.712	0.754	0.600	0.687
WG-SS	0.170	0.130	0.632	0.559	0.464	0.791
Non-WG-SS	0.156	0.310	0.747	0.499	0.540	0.586
Having both	0.025	0.052	0.628	0.101	0.158	0.471
Severity of disability						
No disabilities	0.183	0.322	0.720	0.879	0.728	0.806
Mild disabilities	0.199	0.309	0.701	0.630	0.548	0.648
Moderate disabilities	0.130	0.276	0.752	0.584	0.593	0.704
Severe disabilities	0.083	0.045	0.460	0.469	0.270	0.524

Table 52 examines whether the association between being disabled and access to ECE modified by type and severity of disabilities, Table 53 examines child development, and Table 54 displays predicted probabilities.

Regarding the type of disabilities, first, as is the case of primary and secondary school-age children, having both types of disabilities is negatively associated with ECE in all three countries, but this association is not statistically significant in Ghana. The same is true for child development. Second, as is the case for primary and secondary school-age children, children with only a non-WG-SS survey type of disabilities have similar access to ECE as children without disabilities. However, even this type of disabilities is negatively associated with child development in all three countries. Third, the association is also consistent with the results of primary and secondary school-age children, but children with short survey type of disabilities have similar access to ECE as children without disabilities. However, this is not true in Pakistan. Furthermore, this type of disabilities is negatively associated with child development in Bangladesh and Pakistan, but not in Ghana.

Regarding the severity of disabilities, first, a mild degree of disabilities is not associated with less access to ECE, but it is negatively associated with child development in all three countries. Second, moderate disabilities are negatively associated with ECE access only in Pakistan. However, moderate disabilities are negatively associated with it in all three countries when it comes to child development. Third, a severe degree of disabilities is significantly negatively associated with less access to ECE and child development, although the association between a severe degree of disabilities and child development is not significant in Ghana due to a huge standard error in the estimation. Based on the predicted probabilities, the negative association between being disabled and lack of access to ECE and poor child development is mainly driven

by severe disabilities. These results are consistent with the results among primary and secondary school-age children.

Robustness Check

It is plausible that the negative association between disabilities and access to ECE/child development is causal. At the same time, confounding factors might cause such a correlation, including the quality of governance, which might simultaneously influence the probability of being disabled and the availability of ECE facilities in the area. Previous studies have adopted the household-fixed effects model, which compares children with and without disabilities in the same household to control the plausible source of biases.

Table 55
Linear Probability and Household-fixed Effects Model: Access to ECE and Developmentally on Track Among Children Age 3 and 4

	Bangladesh		Pakistan		Ghana	
	LPM	HH-fixed	LPM	HH-fixed	LPM	HH-fixed
Access to ECE						
Coefficient	–0.07**	–0.12	–0.06***	–0.04	–0.02	–0.01
Standard error	(0.024)	(0.157)	(0.014)	(0.040)	(0.025)	(0.072)
Developmentally on track						
Coefficient	–0.35***	–0.00	–0.12***	–0.16**	–0.12***	–0.18
Standard error	(0.028)	(0.401)	(0.016)	(0.050)	(0.027)	(0.119)
Observations	9446	245	15894	1135	3650	347

Note. * Significance at 5% level ** Significance at 1% level *** Significance at 0.1% level. LPM stands for the linear probability model. HH-fixed stands for the household-fixed effects model.

Table 55 compares the estimations from the linear probability model and household-fixed effects model. In Bangladesh, statistically significant relationships between disabilities and access to ECE/child development are lost, although the direction of coefficients remains negative. In addition, standard errors of the household fixed-effects model are about six and 14 times as large as for LPM. The household-fixed effects model only counts children with disabilities and their household siblings aged between 3 and 4 years. Thus, the sample size is significantly reduced from 9446 to 245, resulting in much larger standard errors. A similar phenomenon is observed in the case of Ghana. Regardless of model, the coefficients are negative. However, standard errors become much larger because of the small sample size (347).

The case of Pakistan could provide a more reliable comparison between the linear probability model and household-fixed effects model since it mains a sample size of 1135, although the size of standard errors become about three times as large as the linear probability model. All the coefficients are negative, and the differences between the linear probability model and the household-fixed effect model are 50%. However, while the coefficient of the household-fixed effects model is smaller in access to ECE, it is larger in being developmentally on track.

The direction and size of differences between the linear probability model and household-fixed effect model are inconsistent between access to ECE and child development and across three countries. Thus, I require surveys with have a larger sample size to judge whether the source of the biases that the household-fixed effects model tries to control exists.

Summary of Chapter 7

Table 56
Summary Table of Chapter 7

	BGD	PAK	GHA
Access to ECE	-	-	NS
ECDI	-	-	-
Interactions – access to ECE			
Boys (the sex of a child)	NS	+	NS
Urban (location)	NS	NS	NS
Wealth	NS	NS	NS
Interactions - ECDI			
Boys (the sex of a child)	NS	NS	NS
Urban (location)	+	NS	NS
Wealth	NS	-	NS
Access to ECE			
WG-SS	NS	-	NS
NonWG-SS	NS	NS	NS
Having both types	-	-	NS
ECDI			
WG-SS	-	-	NS
NonWG-SS	-	-	-
Having both types	-	-	NS
Access to ECE			
Mild disabilities	NS	NS	NS
Moderate disabilities	NS	-	NS
Severe disabilities	NS	-	-
ECDI			
Mild disabilities	-	-	-
Moderate disabilities	-	-	-
Severe disabilities	-	-	-

In general, the relationship between disabilities and education appears even among preschool children. Disabilities are significantly negatively associated with ECE attendance (except in Ghana) and early childhood development. Socioeconomic and demographic factors also

do not influence the associations in many cases. At the same time, negative associations are concentrated among those with severe disabilities and those having both types of disabilities.

Chapter 8. Discussion

This study examined the associations between disabilities and education in Bangladesh, Pakistan (Punjab), and Ghana. Children with disabilities are the most marginalized group of children from schooling in the Global South, yet little international comparative education research has addressed the issue of education for children with disabilities, due to issues of data availability. However, MICS6 changed this situation by incorporating a child functioning module developed by the Washington Group on Disability Statistics. It provided holistic and comparable data on children with disabilities in the Global South. Using MICS6 dataset, I analyzed the associations between disabilities and education (schooling and learning). Then, informed by the social model of disability, I examined if socioeconomic and demographic factors modify the associations. After that, informed by the medical model of disability, I scrutinized whether the associations were modified by the type and severity of disabilities. Finally, I checked whether the associations also appear among preschool children.

For this analysis, I used MICS6 dataset and analyzed it with mainly the logit model with interaction terms. I also employed the second differences to overcome the limitation of the logit model with interaction terms. Based on literature review, I judged my methodology sound to answer the research questions. However, models addressing endogeneity issues, including the household-fixed effects model, might provide more accurate estimations of the associations between disabilities and education. Further, disability information from MICS6 relied on answers from parents and not on medical diagnoses, which could lead to measurement errors in the right-hand side of my equation. Thus, elements of my estimation might include an attenuation bias. To the best of my knowledge, this study was the first international and comparative study to examine learning among children with disabilities and educational situation among preschool children with

disabilities. I considered also the social and medical models of disability in the context of education in the Global South. Through this study, I aimed to inform more-inclusive education policy in the Global South.

Associations Between Disability and Schooling/Learning

Table 57
Summary Table for Associations Between Disability and (Early) Schooling

	BGD	PAK	GHA
Schooling			
Attendance	–	–	NS
Entrance	–	–	NS
Grade attainment	–	–	NS
Access to ECE	–	–	NS

Regarding access to public school, disabilities are negatively associated with Bangladesh and Pakistan, but not Ghana. However, the disability enrollment gap in this study is much smaller than the older data estimated by Filmer (2008) and Mizunoya et al. (2018). In their estimation, the gap reached about 30 percentage points. However, the gap based on the average marginal effect is about 10 percentage points in Bangladesh and Pakistan. Further, previous studies found a significant portion of children with disabilities to be out of school because they did not enter school. However, I found most enter primary school. I suspect these differences derive from the difference between MDGs and SDGs. The previous studies employed household surveys implemented during or even before MDGs. However, MICS6 has been implemented since 2018, within the SDGs era. Disabilities have attracted more attention from education stakeholders since the discussion regarding the post-2015 agenda was initiated. I suspect that this political environment has paved the way for children with disabilities to enroll in and enter schools.

However, it remains unclear how Ghana has solved the enrollment gap associated with disabilities. Based on policy review, Ghana and Punjab in Pakistan introduced an inclusive education policy at a similar time. Thus, further scrutinization is indispensable to understand how the disability gap in schooling appears to have been resolved from the experience of Ghana.

These negative associations between disabilities and schooling even start from primary school entrance, and disabilities are negatively associated with ECE attendance in Bangladesh and Pakistan, but not in Ghana. These negative associations between disabilities and schooling from preschool are interesting because these three countries have realized universal primary education, but ECE access is far from universal, and the situation diverges across the three countries. However, the association between disabilities and schooling/learning among primary and secondary school children already exists among preschool-age children.

Table 58
Summary Table for (Early) Learning

	BGD	PAK	GHA
Numeracy	-	NS	-
Reading	-	-	-
ECDI	-	-	-

Disabilities are negatively associated with learning in general. The only exception is numeracy in Pakistan. However, the FLS numeracy acquisition rate in Pakistan is 20%, which is the lowest in both subjects in all three countries. Thus, I suspect the ceiling effect in this estimation and disabilities to be negatively associated with across subjects and countries. Even in Ghana, where disabilities are not significantly associated with schooling, disabilities are significantly negatively associated with numeracy and reading. Thus, even if children with disabilities go to school, they seem not to learn as children without disabilities do, which is consistent with my

limited classroom observation in Nepal and Malawi. Children with disabilities were certainly in a classroom, but they were just there, and teachers did not even recognize their functional difficulties, which was neither inclusive education nor integrated education.

Accordingly, education stakeholders still need to work on ensuring schooling opportunities for children with disabilities. However, the issue of the disability schooling gap has significantly eased since the previous era, and the problem seems to shift from schooling to learning. The disability gap in schooling and learning also emerges even before their primary school entrance. Thus, education stakeholders should initiate their work on the issue of children with disabilities from early childhood.

Disabilities and Private Schools

Table 59
Summary Table for Disabilities and Private Schools

	BGD	PAK	GHA
Private school attendance	-	-	-
Interactions			
Boys (the sex of a child)	NS	+	NS
Urban (location)	NS	NS	-
Wealth	NS	NS	NS
Types			
Disabilities listed in the short-survey	NS	-	NS
Disabilities not listed in the short survey	NS	NS	NS
Having both types	-	-	-
Severity			
Mild disabilities	NS	+	NS
Moderate disabilities	-	NS	NS
Severe disabilities	-	-	-

As the Global Education Monitoring Report handles inclusion in 2020 and nonstate actors in 2021, the association between disabilities and private school attendance is gaining attention from global education stakeholders. I find disabilities to be significantly negatively associated with private school attendance. The case of Ghana is especially interesting because disabilities are only significantly negatively associated with private school attendance, not with other aspects of schooling. Further, originally, private entities embarked on education for children with disabilities – religion-based organizations. Even today, according to Inclusion Ghana (https://www.inclusion-ghana.org/special-schools.php), both Catholics and Methodists operate special schools and inclusive education classes. In view of disaggregation of disabilities, having both types of disabilities and severe disabilities are especially strongly negatively associated with private school attendance. Thus, even such faith-based private special schools seem not fully able to accommodate such children with disabilities.

Further, various socioeconomic and demographic factors correspond to private school attendance (Table 11). However, they do not influence the associations between disabilities and private school attendance in general. For instance, wealth is significantly positively associated with private school attendance, but wealth does not mitigate associations between disabilities and private school attendance. Simultaneously, relatively wealthy households might purchase a nonschool type of education for their children with disabilities, including private tutors. Currently, however, a comprehensive dataset to investigate this plausible choice of private education remains unavailable. Thus, future studies might address this topic when a reliable dataset appears.

Further, in Ghana, urban residency is positively associated with private school attendance. However, it negatively influences the association between disabilities and private school attendance, implying that private schools in urban areas might be reluctant to accommodate

children with disabilities or that urban parents of children with disabilities might be reluctant to send their children to private schools, including faith-based private schools. Regarding the sex of a child, parents in Bangladesh seem to prefer to send girls to private schools over boys (Table 13). However, the sex of a child does not influence the association between disabilities and private school attendance, and boys and girls with disabilities are similarly predicted to attend private schools.

Overall, private schools tend to accommodate advantaged children, such as those who have better-educated mothers and are from relatively wealthy households. However, disabilities are significantly negatively associated with private school attendance, which is consistent with the case of charter schools in the United States (Bergman & McFarlin, 2018; Dudley-Marling & Baker, 2012). Thus, while private schools attract relatively wealthy children from public schools, children with disabilities are left in public schools. In other words, public schools are losing resources due to this cream-skimming, while they provide reasonable accommodation to children with disabilities. Thus, education stakeholders must consider how to work with nonstate education providers to realize inclusive education not only in public schools but also as a whole education sector, and policy implications from Bergman and McFarlin (2018) might be helpful.

Modifications to the Associations Between Disability and Education Using Social Model of Disability

Table 60
Association Between Disability and (Early) Educational Outcomes Using Social Model of Disability: Summary of Results

	BGD			PAK			GHA		
	Boys	Urban	Wealth	Boys	Urban	Wealth	Boys	Urban	Wealth
Schooling									
Attendance	NS	NS	+	NS	NS	+	NS	–	NS
Entrance	NS	NS	+	NS	NS	+	NS	NS	NS
Attainment	NS	NS	+	NS	NS	NS	NS	–	NS
ECE	NS	NS	NS	+	NS	NS	NS	NS	NS
Learning									
Numeracy	NS	NS	NS	+	NS	NS	NS	NS	NS
Reading	NS	NS	+	NS	NS	NS	+	–	–
ECDI	NS	+	NS	NS	NS	–	NS	NS	NS

As Table 60 displays, socioeconomic and demographic factors do not consistently moderate the associations between disabilities and education. The sex of a child does not modify the associations between disabilities and schooling, with the only exception being access to ECE in Pakistan. Among children without disabilities, girls are advantaged in Bangladesh, boys are advantaged in Pakistan, and there is no difference in Ghana. However, when it comes to children with disabilities, these trends disappear. In particular, it remains unclear why girls' advantage in Bangladesh and boys' advantage in Pakistan disappear among children with disabilities. Additional research is required to uncover the responsible mechanism.

Urban residency also does not modify the association in Bangladesh and Pakistan. However, urban residency exacerbates associations between disabilities and schooling in Ghana, although there is no urban–rural difference among children without disabilities. Ghana is the most urbanized country, and more than half of the population lives in urban areas. Thus, poor urban infrastructure

due to swift urbanization might prevent children with disabilities from going outside to regularly attend school.

Wealth mitigates the associations between disabilities and schooling in Bangladesh and Pakistan, but not in Ghana. Generally speaking, wealthier families tend to live in urban areas. Thus, relatively wealthy parents of children with disabilities in Bangladesh and Pakistan might be able to purchase measures to mitigate the association, while such an advantage might be offset by poor urban infrastructure in Ghana.

The sex of a child in learning does not modify the associations in Bangladesh, although girls are generally advantaged. In Pakistan, being a boy mitigates a negative association between disabilities and numeracy, consistent with boys' advantage in numeracy in general. In Ghana, being a boy also mitigates a negative association between disabilities and reading. This is the only area in which the sex of a child influences the associations between disabilities and education in Ghana, and there is no difference between girls and boys without disabilities in reading. Thus, it remains unclear why such an influence appears in reading alone.

Regarding household location in learning, urban residency ameliorates the association between disabilities and early childhood development. Among children without disabilities, household location is associated with neither access to ECE nor early childhood development. Further, this is the only area in which urban residency modifies the associations between disabilities and education in Bangladesh. Thus, its association mechanism remains unclear. In Pakistan, household location does not modify the associations between disabilities and learning. In Ghana, urban residency worsens the association between disabilities and reading, consistent with the case of schooling.

Finally, wealth worsens the association between disabilities and learning in Pakistan (ECDI) and Ghana (reading), while it improves the association in Bangladesh (reading). I suspect the presence of a ceiling effect in Pakistan and Ghana. The learning status of children from the poorest households is very low, and the gap cannot exist between children with and without disabilities, while it is possible among the relatively wealthier children. In the case of Bangladesh, language homogeneity might be the association mechanism. The percentage of language minorities in Bangladesh is incredibly low (1%) compared to in Pakistan (32%) and Ghana (52%). Such a situation can create a market for reading learning tools from which children with disabilities from relatively wealthier households might be able to purchase, while poorer households find it affordable to do so. Further scrutiny is necessary.

Overall, though, socioeconomic and demographic factors, informed by the social model of disability, do not modify the associations between disabilities and education. My findings suggest that it is not suffice for education policy to simply look at social condition of children with disabilities. Rather, education policy should scrutinize the complex social process that children with disabilities are marginalized from schooling and learning and address it although my dissertation fails to do so due to the pandemic. Further, recent studies (Flintoff et al., 2008; Haegele & Hodge, 2016; Moodley & Graham, 2015) pointed out the importance of intersectionality between disabilities and other factors such as sexism and racism. The same thing can be applied to this discussion. It is not enough to simply prioritize children with double burden between disabilities and other factors, such as wealth and sex. It is indispensable to scrutinize how each intersectionality marginalize children with disabilities from schooling and learning and address it.

Modifications to the Associations Between Disability and Education Using Medical Model of Disability

Table 61
Summary Table for the Associations Between (Early) Education and Severe/Having Both Types of Disability (Medical Model)

	Having both types of disabilities			Severe disabilities		
	BGD	PAK	GHA	BGD	PAK	GHA
Attendance	–	–	–	–	–	–
Entrance	–	–	–	–	–	–
Attainment	–	–	–	–	–	–
Access to ECE	–	–	NS	NS	–	–
Numeracy	–	–	–	–	NS	NS
Reading	–	–	–	–	–	–
ECDI	–	–	NS	–	–	–

The prevalence of severe disabilities and the percentage of children having both types of disabilities are low, resulting in huge standard errors in the estimations. Still, in most cases, both having severe disabilities and having both types of disabilities are significantly negatively associated with schooling and learning. Among 42 estimations, only five are not significant, and there are no positive associations. Even among five cases, I suspect that a combination of the ceiling effect (FLS numeracy acquisition rates are 20% and 26% in Pakistan and Ghana, respectively) and large standard errors leads to this result in the association between severe disabilities and numeracy in Pakistan and Ghana. Thus, at least among school-age children, the negative associations between disabilities and education are driven by those with both types of disabilities and severe disabilities. These children might be considered to have significant disabilities.

Thus, it is essential to provide reasonable accommodations to children with significant disabilities to solve the disability gap in both schooling and learning, and this need would hold

regardless of social context. Thus, in this study, I confirm the concern raised by Palmer and Harley (2012) that the unsuitableness of the social model of disability in identifying the proportion of the disabled population in need of health and social services became more serious in the Global South due to their limited resource for public service. In other words, the provision of reasonable accommodation informed by the medical model of disability might be important to mitigate the associations between disabilities and education in the Global South.

Classification of Disability Using Medical Model of Disability

Table 62
Summary Table for the Associations Between Type of Disability and (Early) Education (Medical Model)

	BGD	PAK	GHA
Attendance			
Disabilities listed in the short-survey (WG-SS)	NS	-	NS
Disabilities not listed in the short survey (NonWG-SS)	NS	-	NS
Entrance			
WG-SS	NS	-	NS
NonWG-SS	NS	-	-
Attainment			
WG-SS	NS	NS	NS
NonWG-SS	NS	NS	NS
Access to ECE			
WG-SS	NS	-	NS
NonWG-SS	NS	NS	NS
Numeracy			
WG-SS	NS	NS	NS
NonWG-SS	NS	NS	NS
Reading			
WG-SS	-	-	NS

Table 62 (cont'd)

NonWG-SS	-	-	-
ECDI			
WG-SS	-	-	NS
NonWG-SS	-	-	-

The Washington Group on Disability Statistics created a short survey with a limited number of question items to collect disabilities information even under resource constraints. Thus, disabilities listed in the short survey should be more significantly negatively associated with social participation (e.g., schooling and learning) than disabilities not listed in the short survey. However, when disabilities listed in the short survey are negatively associated with schooling or learning, disabilities not listed in the short survey are also negatively associated with them, with the one exception case of ECE access in Pakistan. Rather, in Ghana, even when disabilities listed in the short survey are not significantly associated with schooling and learning, disabilities not listed in the short survey are significantly negatively associated with them in some cases, such as school entrance and reading. Thus, if for some reason education stakeholders collect disabilities information solely based on the short survey, they would dismiss certain children with disabilities who are also marginalized from schooling and learning.

Table 63
Summary Table for the Associations Between Mild Disability and (Early) Education (Medical Model)

	BGD	PAK	GHA
Schooling			
School attendance	NS	NS	NS
School entrance	+	NS	NS
School attainment	NS	NS	NS
Private school attendance	NS	+	NS
Access to ECE	NS	NS	NS
Learning			
Numeracy	–	NS	NS

Table 63 (cont'd)

Reading	–	–	NS
Early childhood development	–	–	–

Neither the Washington Group on Disability Statistics nor the Child Functioning Module of UNICEF considers children with only mild functional difficulties to be children with disabilities. In fact, mild disabilities are not significantly negatively associated with all aspects of schooling, including early childhood education. However, mild disabilities display significant negative associations in learning in some cases. For instance, they are negatively associated with early childhood development in all three countries. In Pakistan, they are also significantly negatively associated with reading skills. In Bangladesh, mild disabilities are significantly negatively associated with numeracy, reading, and early childhood development. Thus, under the Millennium Development Goals, which did not attend to the quality of education and learning, the current classification of disabilities might have worked. However, under the current global targets, the quality of education and learning are considered to be policy targets. Thus, children with mild disabilities should not be dismissed in some contexts (e.g., Bangladesh and Pakistan), and this point is consistent with the concern raised by Sprunt et al. (2019) that the cut-off point of disabilities in this survey is not appropriate. Thus, although education policy informed by the medical model of disability might be effective, careful attention should be paid to classifying children with disabilities. Simply following the global classification of disability may be insufficient to overcome this problem.

Education policy implications from the medical and social models of disabilities tend to be in tension with each other. The medical model assumes that it is impairment that marginalize people with disabilities from their social participation (Engel, 1977). Accordingly. education

policy informed by the medical model should address impairments of children with disabilities so that they can attend school, acquire skills and knowledge, and participate in society. Contrary, the social model of disability assumes that it is society that marginalize people with disabilities from their social participation (Oliver, 1983). Thus, education policy based on the social model should work with society so that children with disabilities can go to school and learn. However, recent scholars criticize this dichotomy. The social model addresses the point that medical model dismissed, but impairments still influence social participations of people with disabilities (Llewellyn & Hogan, 2002; Palmer & Harley, 2012; Shakespeare & Watson, 2001; Thomas, 2004).

My findings are in the same line with the recent scholars, and both medical and social models of disability should be considered to ensure schooling and learning among children with disabilities in the Global South. The type and severity of disabilities influences the extent of associations between disabilities and schooling/learning, which indicates that education policy should pay attention to impairments that children with disabilities have to ensure their schooling and learning.

This study fails to examine the complex social process that children with disabilities are marginalized from schooling and learning by conducting qualitative research in targeted countries due to the pandemic. Still, my findings suggest that even if education policy needs to work with society, if they simply focus on social conditions, such as geography, wealth, or location, rather than the complex social process, they would fail to ensure schooling and learning among children with disabilities. Education policy should take into account both impairments and the complex social process that marginalize children with disabilities.

Limitations

This research faces limitations in scope, dataset, and methodology. Regarding scope, I abstain from placing disabilities in interaction with certain social factors, including ethnicity. Bangladesh, Ghana, and Pakistan are ethnically rich countries.[13] Although other research provides descriptive information about disabilities and poverty, gender, or location, due to its richness, research has not reached to analyze disabilities in each ethnic group in three countries. Thus, I cannot readily construct hypotheses about the coefficients of the interaction term between disabilities and ethnicity nor consider whether they are biased and, if yes, which direction from the other study. Further, COVID-19 has discouraged international travel and unnecessary contact with a vulnerable population, including people with disabilities. This situation prevents me from conducting rigorous qualitative research to interpret such social factors in each country.

Regarding the dataset, MICS6 measures child functioning based on answers from parents. Thus, unlike the medical diagnosis, it entails certain measurement errors. In fact, a large variation in the prevalence of disabilities across three countries might be caused by measurement errors. I use disabilities on the right-hand side of the equation in this study. Thus, my estimations might be affected by attenuation bias. Additional studies might work on a greater number of countries to regard this issue.

With respect to methodology, I cannot find an external variation in the prevalence of disabilities, and this study remains correlational. Based on my literature review, the results of a correlational study of disabilities and education should not significantly diverge from the results of a causal study. However, an additional study might find an external variation to present an accurate picture of the impact of disabilities on education in the Global South. Further, I cannot

[13] MICS Bangladesh listed up 10 ethnicities and other, and Ghana did 8 ethnicities and other. Although MICS Pakistan (Punjab) did not collect ethnicity and religion information, Pakistan has more than 10 major ethnic groups.

implement qualitative data collection due to COVID-19, which would have uncovered the mechanism behind the negative associations between disabilities and education and implications for solving the disability gap. Thus, I fail to provide reliable and plausible reasons why the associations between disabilities and education are weak in Ghana. One way for an additional study to work on this issue is to implement mixed-methods research once research with vulnerable populations across the world becomes practical and feasible again. Thus, researchers must exercise careful discretion when implementing mixed-methods research. Another mode for an additional study would analyze all MICS6 countries and conduct a cross-country analysis to find macro-level factors stipulating the strength of the associations between disabilities and education, which is more feasible in the current situation of the COVID-19 pandemic.

As a minor limitation, the findings from this study cannot apply to conflict and post-conflict countries, although the number of such countries is increasing. I focus on countries that have not recently been in conflict because of my limited knowledge of the influence of conflict on disabilities and education. Considering the current global situation, an additional study should analyze the associations between disabilities and education.

APPENDIX

Appendix

As of July 2020, the MICS6 dataset is available in 22 countries, as the table below indicates. Geographically, these 22 countries are spread across the world: Eight countries are from Sub-Sahara Africa (SSA), two are from South Asia (SA), two are from Latin America and the Caribbean (LAC), five are from East Europe and Central Asia (ECA), two are from the Middle East and North Africa (MENA), three are from the East Asia and Pacific (EAP) region. The national wealth level of these countries also varies:[14] Five countries are from low-income countries (L), 10 are from lower-middle-income countries (LM), and seven are from upper-middle-income countries.

Table 64
List of MICS6 Countries

Country	Year	Region	Income	U5 sample	5–17 sample	Analysis?
Bangladesh	2019	SA	LM	14072	66705	Yes
				2.8%	8.3%	
Congo, DRC	2017–18	SSA	L	12815	36618	No
				7.3%	19.5%	War
Costa Rica	2018	LAC	UM	226804	974918	No
				7.2%	20.8%	Upper-middle
Gambia	2018	SSA	L	6146	21074	No
				5.2%	10.1%	Publication
Georgia	2018	ECA	UM	1606	5827	No
				1.8%	9.5%	Too small
Ghana	2017–18	SSA	LM	5495	21871	Yes
				10.8%	20.7%	
Iraq	2018	MENA	UM	10300	43867	No
				2.8%	22.1%	Upper-middle
Kiribati	2018–19	EAP	LM	1255	5033	No
				12.6%	22.5%	Too small

[14] This paper follows the country income classification of the World Bank. The classification based on the year when the survey was implemented. Thus, the latest classification does not necessary match with the classification of this paper.

Table 64 (cont'd)

Kyrgyzstan	2018	ECA	LM	2162	7491	No
				1.3%	8.9%	Too small
Lao	2017	EAP	LM	7250	X	No
				2.0%		Too small
Lesotho	2018	SSA	LM	2048	9259	X
				8.2%	8.0%	Too small
Madagascar	2018	SSA	L	7528	27601	X
				9.6%	14.2%	Publication
Mongolia	2018	EAP	LM	3795	12273	X
				1.9%	6.1%	Too small
Montenegro	2018	ECA	UM	689	2037	X
				0.8%	7.5%	Too small
North Macedonia	2018–19	ECA	UM	931	2397	X
				2.2%	11.1%	Too small
Pakistan (Punjab)	2017–18	SA	LM	23800	35482	O
				6.4%	17.9%	
Sierra Leone	2017	SSA	L	7090	25194	X
				6.6%	23.1%	War
Suriname	2018	LAC	UM	2628	7722	X
				4.5%	13.6%	Too small
Togo	2017	SSA	L	2950	12026	X
				7.8%	21.2%	Too small
Tunisia	2018	MENA	LM	2166	9178	X
				3.5%	23.7%	Too small
Turkmenistan	2019	ECA	UM	2359	7788	X
				1.1%	2.6%	Too small
Zimbabwe	2019	SSA	LM	3754	15106	X
				3.8%	10.1%	Too small

Source: Created by author

From these 22 countries, this study eliminates countries based on the following criteria. First, for the sake of statistical purposes, this study eliminates countries with small sample sizes. Specifically, this study employs wealth quintile regression and interaction terms with types and severities of disabilities. Thus, as Luo et al. (2020) do, this study also eliminates countries with less than 50 children in each category for both ages 2–4 and 5–17: Georgia, Kiribati, Kyrgyzstan, Lao, Lesotho, Mongolia, Montenegro, North Macedonia, Suriname, Togo, Tunisia, Turkmenistan, and Zimbabwe.

Second, this study focuses on children with disabilities in impoverished contexts. Thus, this study limits its sample countries to low- and lower-middle-income countries, not upper-middle-income countries. Based on this criterion, Costa Rica and Iraq are eliminated from this study.

Thirdly, this study also eliminates countries in which young people have experienced any war. The number of people with disabilities in society should increase after a war, and the post-conflict situation is unique for people with disabilities. Thus, how disability is socially constructed and how different types and severities of disabilities negatively affect schooling and child learning should differ between countries with and without war. This study focuses on the latter context – impoverished society but without war. Regarding wars, this study follows definitions and data from the Uppsala Conflict Data Program managed by the Department of Peace and Conflict Research, Uppsala University. They define war as "A state-based conflict or dyad which reaches at least 1000 battle-related deaths in a specific calendar year." Regarding young people, this study follows the definition made by Generation Unlimited (Gen U). Gen U is a global multi-sector partnership to meet the urgent need for expanded education, training, and employment opportunities for young people, ages 10–24, on an unprecedented scale. Thus, their definition of young people is widely accepted by the global community. Therefore, this study eliminates countries that have become battlefields and lost at least 1000 lives in a specific calendar year since 1996: within the scope of this study, the Democratic Republic of Congo and Sierra Leon.

Lastly, this study eliminates countries in which research about children with disabilities is scarce to understand results of regression analysis. Specifically, I use Google Scholar and ERIC with the search term "inclusive education" + "country name". While no peer-reviewed papers in the field of education were found in Gambia and Madagascar, at least a few papers appeared in

Bangladesh, Ghana, and Pakistan. Thus, I decided to eliminate Gambia and Madagascar from this study.

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