JANUARY 2021

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A SIMULATION OF COVID-19 SCHOOL CLOSURE IMPACT ON STUDENT LEARNING IN BANGLADESH

Tashmina Rahman and Uttam Sharma

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Tashmina Rahman[1] and Uttam Sharma[2]

1. INTRODUCTION

Nearly 38 million learners in Bangladesh have been affected by the largest disruption of education systems in history caused by the COVID-19 pandemic. National school closures in Bangladesh started from March 17, 2020 and continue to remain so[3]. The Government of Bangladesh (GoB) was quick to respond to the crisis and ensure learning continues. The Ministry of Primary and Mass Education (MoPME) and Ministry of Education (MoE) started implementing remote learning through pre-recorded classes hosted on televised broadcasts and online platforms by the first week of April 2020. The MoPME has established working groups to develop learning content and roll out lessons through four platforms: television, mobile phones, radio, and internet[4].

Prolonged school closures threaten to erase education development gains achieved in recent decades, especially for girls and those from disadvantaged backgrounds. Even before the COVID-19 pandemic, Bangladesh was grappling with issues of out-of-school children (OOSC) and low and unequal learning outcomes. Equity issues remain with pockets of OOSC in hard-to-reach areas, such as urban slums, hill tracts, sandbars, and wetlands. Around 7 million children and adolescents (80 percent in rural areas) ages between 6 and 16 years were estimated to be out of school in 2016.[5] Furthermore, learning levels are low and unequal, as most school children are not reaching their grade-level competencies. The latest National Student Assessments show that more than 50 percent of Grade 5 students did not achieve grade-level proficiency in Bangla and Math while 26 percent and 58 percent of Grade 3 students did not achieve grade-level proficiency in Bangla and Math, respectively.[6] At the Grade 8 level, competencies in English and Math are 44 percent and 35 percent, respectively. There are large differences among subpopulations: students from well-off and urban areas do better than those from poorer families and rural areas.[7]

This Note presents results from a series of simulations that aim to capture the impacts that school closures in Bangladesh might have on the learning levels, enrollment and future earnings of children and students using a methodological tool developed by the Education Global Practice of the World Bank[8]. We find that overall loss in learning for every child enrolled in school even in the most optimistic scenario is expected to be substantial and the economic implications of the learning losses are huge. Available data also indicates that remote learning requires to be made more effective. It is hoped that the insights from this Note will be useful for the government, non-government, private sector and civil society engaged in education service delivery as they are attempting to forge effective partnerships during and after the crisis. There is an urgent need to substantially reduce additional dropouts and absenteeism through stipends and safe school opening and communication campaigns. In this Note, we first present an overview of the methodology, including the analytical framework, simulation scenarios and how to interpret them. Then, we draw on the simulation exercise findings for Bangladesh based on the modelling and policy implications.

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[3] Schools continue to remain closed during the disclosure of this Note as of Jan 18, 2021.

[4] Government, private, and NGO entities comprise the working groups.

[5] HIES, 2016–17. According to the latest Multiple Indicator Cluster Survey (MICS), 13.95 percent of children ages 6–16 are OOSC, and only 35 percent of them were female.

[6] Statistics for primary level are from National Student Assessment (NSA) 2017 conducted by the MoPME/DPE; statistics for secondary level are from Learning Assessment for Secondary Institutions (LASI) 2015 conducted by the MoE/DSHE.

[7] For details, refer to: Bhatta, Saurav Dev; Sharma, Uttam. 2019. Whither Quality? What Do Recent National Assessments of Student Learning Outcomes in Bangladesh Tell Us? . Washington, DC: World Bank.

[8] Joao Pedro Wagner De Azevedo, Amer Hasan, Koen Martijn Geven, Diana Goldemberg, Syedah Aroob Iqbal (2020). Country tool for simulating COVID-19 impacts on learning, schooling and life-cycle earnings. Washington DC: World Bank.

2. METHODOLOGY

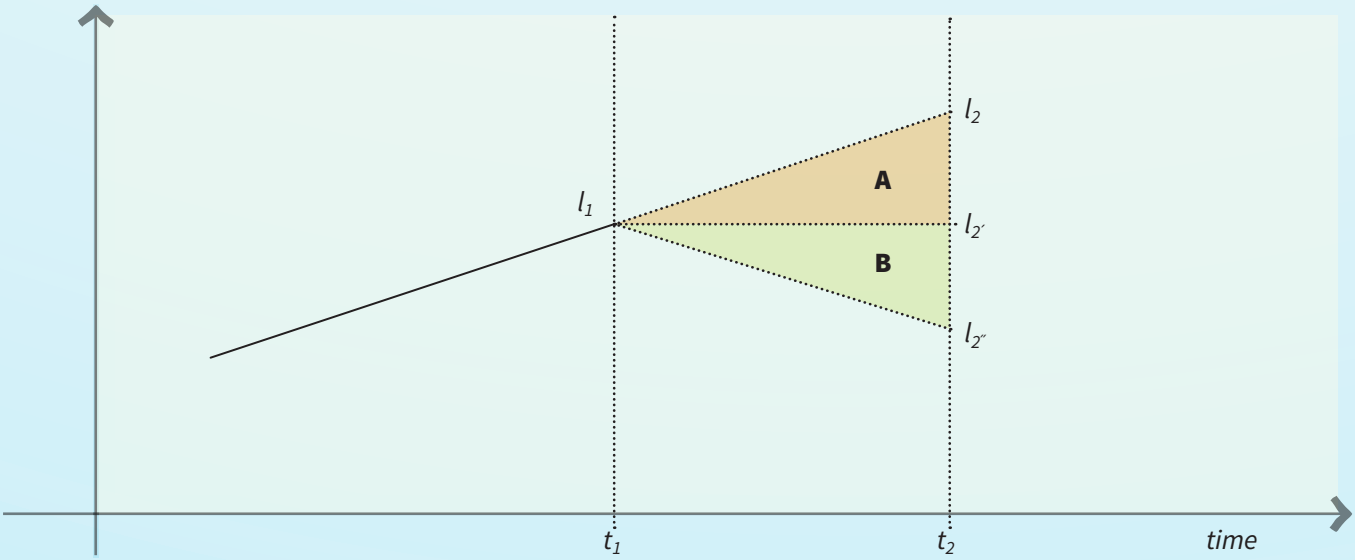
i. Analytical Framework

The simulations conceptualize learning loss in two ways: (1) as learning that will not take place while schools closed, which is directly linked to schooling adjusted for quality, (2) as the already acquired learning that will be lost or forgotten when students lose their engagement with the educational system. The framework also captures the impact of school dropouts through the income shock channel. Furthermore, any mitigation of school closures is also considered in simulating potential learning loss. Mitigation measures are considered as (i) supply of remote learning modalities by the governments; (ii) access to these modalities by income levels and (iii) effectiveness of these modalities by income level. On balance, school closures, mitigation efforts and their effectiveness as well as the effect on household incomes will all come together in impacting not only the amount of schooling children receive but also their learning outcomes.

The analytical framework which underpins the simulations is illustrated in Figure 1. It considers the current cohort of students as a panel of students who we observed just before the crisis, and whom we can observe again the moment that schools reopen. It is assumed that for a given level of quality of education, learning (l), for this cohort of students, is a linear function of the amount of time t spent at school. The length of school closures (s), assuming no mitigation, will reduce the amount of time students will be exposed to learning opportunities from the educational system. Thus, if schools close between t_1 and t_2, and assuming no mitigation, we no longer expect any new learning to take place, and at t_2, the student will be in principle at l_2'.

However, this is not the whole effect. As students disengage from education, part of their stock of learning (l_1) will be forgotten such as has been found for summer breaks in various settings. This will bring students from l_2' to l_2''. The area of triangle A (bounded by l_1 , l_2', and l_2'') corresponds to the learning that will not take place while schools are closed, while triangle B (bounded by l_1, l_2', and l_2'') corresponds to the learning that will be lost due to school disengagement and dropout. The learning loss due to each of these mechanisms will be a function of how effective mitigation strategies might be.

Figure 1: Analytical Framework for an Individual Student



Source: Based on Azevedo et.al. (2020).

ii. Learning Loss Scenarios: Optimistic, Intermediate and Pessimistic

The simulations below consider the effects of school closures of various lengths, effectiveness of mitigation strategies considering different groups in the population and examine both the likely impact on average as well as the impact over the entire distribution of learning outcomes.

The simulations[9] are based on three scenarios described in Table 1:

Scenario 1: **Optimistic**, whereby schools are closed only for 8 months of a 10-month school year[10], and the effectiveness of mitigation measures put in place by governments (such as remote learning) is relatively high.

Scenario 2: **Intermediate**, whereby schools are closed for 9 months, and mitigation measures have a middle level of effectiveness. This is the most realistic scenario that we see, given that school closures are approaching the 9 month-mark in Bangladesh.

Scenario 3: **Pessimistic**, whereby, schools are closed for 10 months (the whole school year is lost), and mitigation measures have low levels of effectiveness. This may still become a reality even with phase-wise schools re-opening, as it is unclear what the path of the pandemic will be during the rest of the school year.

[9] All parameters and data sources are available in Annex 1.

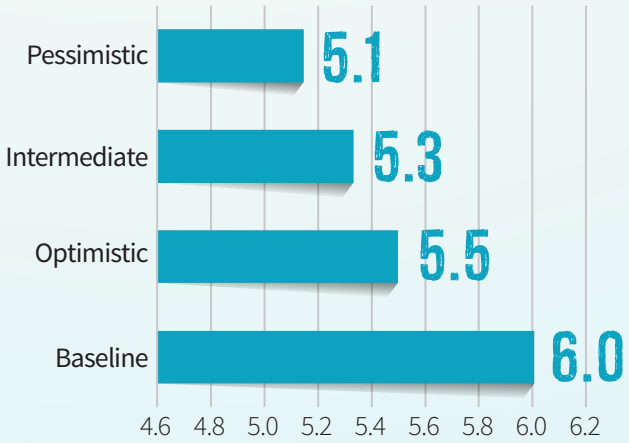
[10] The school year in Bangladesh follows the calendar year of January to December.

3. KEY FINDINGS

Overall loss in learning for every child enrolled in school even in the most optimistic scenario is expected to be substantial. Pre-pandemic estimates based on the World Bank's Human Capital Index 2020 show that a Bangladeshi child who starts school at age 4 can expect to complete on average 10.2 years of school by age 18. Factoring in for quality, the Learning Adjusted School Years (LAYS) is reduced to average of 6 years of schooling[11]. School closures from the pandemic will result in a loss of between 0.5 and 0.9 years of learning-adjusted schooling for an average student. The simulations suggest that the LAYS could fall to between 5.1 and 5.5 years by the time schools have fully reopened. In the intermediate scenario, this is expected to be 5.3 years (Figure 2). The scenarios consider length of school closures and the effectiveness of mitigation being offered through current distance learning programs.

School closures are likely to push more children into learning poverty. Pre-pandemic estimates show that 57 percent of Bangladeshi children could not read and understand a simple text by the end of primary school in 2017[12]. This is lower than both the average for South Asia (59%) and the average for lower middle-income group countries (59%). Simulation estimates show that school closures will increase the share of children who do not attain the minimum reading proficiency at the end of primary (Grade 5) by 18 percentage points to 76 percent,

Figure 2: Average Learning Adjusted Years of Schooling from COVID-19 related school closures for Bangladesh



Source: Authors' estimation based on Azevedo et al (2020).

considering all children are affected equally by school closures. This results from a shock to the distribution of learning outcomes with a reduction of 0.7 years of quality adjusted learning (8.4 months out of a 10-month school year).

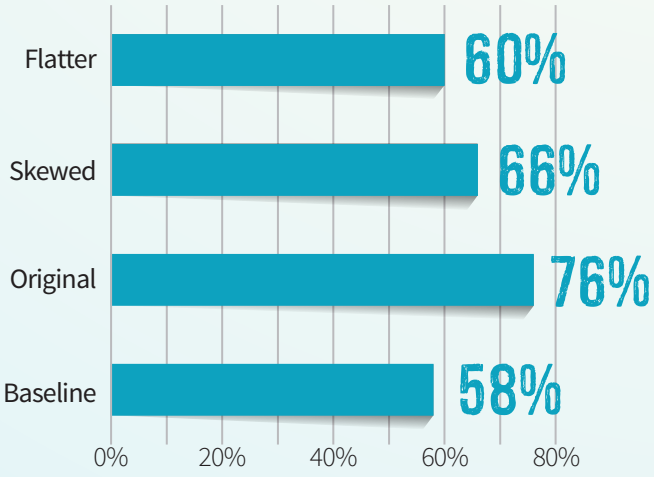
However, school closures shocks are likely to impact each child differently depending on socio-economic characteristic. In the scenario where the learning distribution skews, the share of children below minimum proficiency goes up by 8 percentage points (66 percent) and the most disadvantaged students lose most. In the scenario where the learning distribution flattens, the result fall in between the two extreme scenarios already mentioned. In this case, students who were ahead in terms of learning before the pandemic will continue to pull ahead relative to those students who were struggling, with the latter expected to further fall behind. The exacerbation in learning inequities during pandemic induced school closures are expected as children from well off families are more likely to have access to resources for learning continuity, educated and involved parents and are less likely to be impacted by income loss compared to children from socio-economically disadvantaged families[13].

[11] For details on LAYS, please refer to Filmer, Deon, Halsey Rogers, Noam Angrist and Shwetlena Sabarwal. Learning- Adjusted Years of Schooling (LAYS): Defining a New Macro Measure of Education. Economics of Education Review.

[12] World Bank. 2019. Bangladesh: Learning Poverty Country Brief. World Bank. Washington DC. http://pubdocs.worldbank.org/en/260091571223515547/SAS-SACBB-BGD-LPBRIEF.pdf. Note: The learning poverty index adjusts for out-of-school children.

[13] The possible increase in learning inequity are discussed in detail in: World Bank. 2020. The COVID-19 Pandemic: Shocks to Education and Policy Responses. World Bank, Washington, DC.

Figure 3: Share of Students Below Minimum Proficiency



Source: Authors' estimation based on Azevedo et.al. (2020).

Moderate increase in OOSC for certain populations is likely to occur from COVID-19 income losses. An estimated 35,200 additional children are expected to drop out from primary and secondary education. Given that seven million children between ages 6-17 years old are already out of school, this represents a very small expected rise. This low expected dropout is largely driven by the projected income shock in 2020 for Bangladesh based on the June 2020 growth estimates for Bangladesh that assumes growth to in fact increase by 0.6 percent in 2020[14, 15]. Perception data from recent surveys also supports that additional dropouts may be moderate. A WB survey finds that 91 percent of adolescents aged 10-18 years old from 2,095 households expressed to return to school when restrictions are lifted[16]. Similarly, an ADB study reports more than 96 percent of children aged 8-14 years in school before school closure planned to return to school when schools are physically re-opened[17]. While there will drop-outs in primary, this is expected to be much higher for lower secondary and upper secondary grades. This is likely because older children are in position to seek outside employment and support families whose income sources have drastically reduced as a result of COVID-19.

However, we are cautious that the OOSC estimate is likely to be a lower bound estimate as it does not consider country-specific social norms and behavioral aspects. As the pandemic pursues, there have been reports of early age marriages among school-aged girls as poorer families cope with income losses during the pandemic[18]. For example, half of the sampled 2,095 households from a World Bank survey report losing employment permanently or temporarily due to COVID-19, with 83 percent of households reporting some income loss[19]. Moreover, parental concerns about child safety are undoubtedly going to dominate household decision-making around sending children back to schools when they reopen. The same ADB study cited above found that school attendance is likely to drop significantly after school re-opening as a result of lost motivation to study (50% of respondents) and financial challenges (27% income drop on average). The problem is expected to be particularly acute for the most disadvantaged groups.

Economic implications of the learning losses are huge. The COVID-19 pandemic is poised to translate into a substantial economic cost on the long run. If we quantify this loss of learning in terms of labor market returns, the average Bangladeshi student will face a reduction between an optimistic and pessimistic range of US$198 and US$335 in yearly earnings (2017 PPP) once s/he enters the labor market, which represents between 4 percent and 6.8 percent of annual income. The is higher than the SAR average which ranges between $116 to $319 losses per student per year. Aggregated for all students in Bangladesh and projected ten years into the future when all graduates have entered the labor market, this would cost the Bangladesh economy between US$67 billion and US$114 billion in GDP at Net Present Value (2017 PPP)[20]. In the intermediate scenario, aggregating for all students, this would cost the Bangladesh economy to lose US$89 billion in GDP annually.

[14] Source: World Bank Macro Poverty Outlook 2020

[15] Rapid Response Phone Survey in poor and slum areas in Dhaka and Chittagong City Corporations show substantial recovery in terms of employment, and Chittagong has reached pre-COVID levels in September 2020 (based on Summary of findings (draft version), Poverty and Equity Global Practice 2020.

[16] Baird, Sarah Jane; Seager, Jennifer; Sabarwal, Shwetlena; Guglielmi, Silvia; Sultan, Maheen. 2020. Adolescence in the Time of COVID-19: Evidence from Bangladesh. South Asia Gender Innovation Lab Policy Brief. Washington, D.C.: World Bank Group.

[17] Asian Development Bank, 2020). "Impact of COVID-19 on primary students and the experience of remote learning in disadvantaged areas of Bangladesh." Draft version

[18] BRAC. 2020. COVID-19 Impact on Education. Field Findings and Implications for the Future. Presentation on May 19, 2020. Dhaka: Bangladesh.

[19] Baird, S.J et. al, 2020

[20] The result is conditional on the country's life expectancy, expected work life of a typical adult as well as them human capital utilization, and assumes that none of these aspects will be affected by the COVID-19 crisis. The results also assume that the returns to education remain at 8% in the long run.

Mitigation measures remain inadequate with low access and uptake of current remote learning provision. Despite the rapid efforts deployed by the GoB to ensure learning continues during school closures, recent studies show that remote learning requires to be made more effective. First, access to supply of remote learning varies across households. Table 1 shows the access to different types of remote learning devices by gender among children of preprimary to Grade 10 ages. Access to television remains high among both school-attending and non-attending children, while computer has the lowest penetration among the four remote learning mediums. However, when considering income levels, there is a clear divide with only around 9.2 percent of school-going children and OOSC from the poorest household quintile having access to tele-broadcasting as opposed to the 91 percent of school-going children and 88 percent of OOSC from the richest household income group (table 2). While access to mobile phones remains high across all groups, a large share of these may not include internet connections.

When supply is available, participation is often low - a recent World Bank survey found only 39 percent a sample of 2,000 Grade 9 stipend recipients had access to government televised lessons[21]. Of those with access, about half of them are accessing them and less than 10 percent chose to regularly participate in these sessions. Though 21 percent of the households had access to government provided online learning programs, only 2 percent chose to access them.

Table 1: Access to Remote Learning Platforms by Gender and Location (Percentage share)

	Total	Boys		Girls	
		Urban	Rural	Urban	Rural
All children ages 5 to 15					
TV	56.7	78.3	49.2	77.6	50.0
Radio	0.5	0.4	0.5	0.5	0.5
Mobile phone	96.8	97.9	96.6	97.8	96.5
Computer (including laptop and tablet)	5.0	12.0	2.5	13.1	2.7
OOSC ages 5 to 15					
TV	43.6	69.1	36.5	65.2	37.1
Radio	0.4	0.3	0.4	0.2	0.3
Mobile phone	95.3	97.2	95.0	97.1	94.6
Computer (including laptop and tablet)	2.0	3.5	1.3	5.1	1.3

Source: Authors' estimates based on MICS 2019

Table 2: Access to Remote Learning Platforms by Income Quintiles (Percentage share)

	Poorest	Second Poorest	Middle	Second Richest	Richest
All children ages 5 to 15					
TV	9.2	35.5	59.7	75.9	91.0
Radio	0.3	0.3	0.5	0.5	0.8
Mobile phone	92.1	97.3	98.0	98.4	98.9
Computer (including laptop and tablet)	0.3	0.6	1.5	3.9	19.6
OOSC ages 5 to 15					
TV	8.4	30.5	52.3	66.8	87.6
Radio	0.2	0.4	0.4	0.6	0.5
Mobile phone	90.9	96.2	97.1	98.1	99.0
Computer (including laptop and tablet)	0.3	0.6	1.1	2.4	10.8

Source: Authors' estimates based on MICS 2019.

[21] Biswas, Alok Kumar; Asaduzzaman, T. M.; Evans, David K.; Fehrler, Sebastian; Lnu, Deepika Ramachandran; Sabarwal, Shwetlena. 2020. TV-Based Learning in Bangladesh: Is it Reaching Students? Washington, D.C.: World Bank Group.

4. CONCLUSION

Ensure more effective mitigation measures reaching all school-aged children. The GoB has taken the right initiative for multi-modal remote learning delivery using television, radio, online and mobile phones. It will be important to make all four platforms functional through content development and delivery to reach as many students. At the same time, digital content based remote learning may not be a feasible option for children from the poorest families who generally do not have access to television, radio and internet. In these cases, other methods may be employed including use of physical learning packages delivered to students' home, mobile-based lessons or face-to-face classes maintaining social distance and protocols for small groups. To make remote learning effective, more engagement between teachers and students, either in person maintaining physical distance, or virtually is also necessary.

Remedial education to help students catch up when school re-open coupled with preparing teachers to teach at right level. To ensure this, the first step is to assess student learning when they return to classrooms and identify learning loss through formative assessment on literacy and numeracy competencies. It will be critical to train teachers on formative and summative assessments and remedial education to help students catch up on learning losses once school re-open. Where possible, individualized or grouping students by learning levels during remediation would be important to accelerate learning. This is important because one of the biggest predictor of school dropouts is falling behind in studies, especially from low quality schools (Branson, Hofmeyr and Lam, 2014)[22], and amidst the pandemic impact, most children, especially for the most disadvantaged groups, the learning loss is likely to be severe.

Reduce additional dropouts and absenteeism once school open through stipends, safe school re-opening and communication campaigns. Stipends will continue to play an important role to bring back and retain children from poorer families. Schools re-opening must ensure critical safety and health facilities and protocols are in place, and school and local education administration's capacity to monitor and manage schools safely are enhanced. Involving parents and communities will be important to build confidence and improve school re-opening process. Communication campaigns through different mediums will be important to ensure learning continues while schools are closed as well as when they re-open.

Leverage partnerships in managing education delivery during and after the crisis. Effective partnerships between government, non-government, private sector and civil society engaged in education service delivery is important now more than ever. The remote learning working groups, comprising of different entities, is a good example of bringing together expertise in effectively responding to the crisis. The experience from a devastating earthquake in Northern Pakistan is 2005 is very instructive in that learning levels of children aged 3 to 15 was much worse if they lived in areas badly affected by the earthquake particularly for those whose mother had completed less than primary education.[23] It will be important to continue to collaborate and bring expertise together in finding solutions to ensure learning continues for the poorest children, prepare teachers for post-pandemic classrooms, develop effective remedial education model as well as bring much-needed additional resources to build back better and support the infrastructures for a resilient education system.

[22] Nicola Branson, Clare Hofmeyr & David Lam (2014) Progress through school and the determinants of school dropout in South Africa, Development Southern Africa, 31:1, 106-126

[23] Andrabi, T., Daniels, B., Das, J. 2020. Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005. RISE Working Paper Series. 20/039. https://doi.org/10.35489/BSG-RISE-WP_2020/039

5. ANNEX

Annex 1: Parameters used for the Simulation Scenarios

A. Learning gains or school productivity (in HLO points/year)	**30**
Optimistic Scenario	
B1. School closure (share of a school year)	80%
C1. Mitigation effectiveness (0 to 100%)	39%
D1. HLO decrease (points) = A*B1*(1-C1)	14.6
Intermediate Scenario	
B2. School closure (share of a school year)	90%
C2. Mitigation effectiveness (0 to 100%)	28%
D2. HLO decrease (points) = A*B2*(1-C2)	19.4
Pessimistic Scenario	
B3. School closure (share of a school year)	100%
C3. Mitigation effectiveness (0 to 100%)	17%
D3. HLO decrease (points) = A*B3*(1-C3)	24.9
Gross Domestic Product (GDP) per capita growth (%)	0.6%

Note: HLO = Harmonized Learning Outcomes

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