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Equity in Education Outcomes and Spending in Bangladesh: Evidence from Household Income and Expenditure Surveys

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Bangladesh has continued to improve access to education and educational attainment. Gains have been equitable, reducing disparities by gender, wealth, and geography. Yet progress is still needed at higher education levels, and there are still persistent gaps between the poor and rich and across districts. Gains are partly the result of the Government of Bangladesh (GoB) efforts to improve education outcomes, but also reflect increased private spending by households. GoB education spending is still low compared to other countries in the region and presents large variation across the territory, which is not correlated with education outcomes and internal efficiency indicators. Only when public spending translates into lower student-to-teacher ratios do outcomes seem to improve, but those ratios remain inadequate compared to other countries and unevenly distributed across districts. Focusing on higher quality spending rather than increasing overall budgets will be a priority for further progress. Stipend programmes help with the progressivity of the system at the primary level. However, at the secondary level, there is still significant room to improve the progressivity of these benefits. Finally, addressing norms and expectations around the benefits of schooling can be an important avenue to increase school attendance. About four in ten secondary school-age children out of school report lack of interest or being too old to go back as their main reasons for not attending school; three in ten females cite family chores and marriage as reasons for not attending.

Keywords: Human Capital, Equity, Stipend Programmes, Public Spending
JEL Classification: I24, I26, I38, J24

I. INTRODUCTION

Investments in education have immense intrinsic and instrumental value. At the individual level, education creates opportunities for better labour market

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outcomes, higher incomes, reduced poverty, and improved overall welfare. For societies, education is central for development, growth, stronger institutions, and social cohesion. Bangladesh has made remarkable progress in expanding access to education, with sustained expansions in attendance rates for all levels of education. These gains have been an important driver of the substantial poverty reduction observed in the past decades (World Bank 2018).

This paper relies on the recently completed Household Income and Expenditure Survey (HIES) 2016/17 to provide an updated picture of education outcomes in Bangladesh. Evidence suggests that improvements in education attainment have been important in explaining gains in welfare levels and poverty reduction across the country. However, as access at the national level becomes widespread, it becomes more relevant to identify lagging areas, in order to then understand their specific challenges and better define policies and interventions. An important feature of the latest HIES survey is that it is representative at district level, which provides a unique opportunity to compare outcomes across the country.

The HIES 2016/17 is combined with its previous three rounds (HIES 2000, 2005, and 2010) to depict the main trends in education attainment and enrollment by gender, income levels, and across regions.[1] Moreover, detailed education expenditure data by households is combined with government budget data processed under the BOOST[2] initiative to analyse the progressivity of public spending. Finally, the relationship between spending and key outcomes at the district level is analysed to inform about the effectiveness of public spending. The analysis also relies on information from the Annual Primary School Census

[1] The *Household Income and Expenditure Survey* (HIES), cross-sectional, is the main official source of information about households' consumption, poverty and income. The HIES 2016/17 data were collected from April 2016 until March 2017. The previous rounds of HIES data were collected in 2000, 2005, and 2010. For the rest of this paper, we refer to the yearly estimates as from 2000, 2005, 2010, and 2016, respectively.

[2] BOOST (in all caps) is not an acronym. It is the name of a data tool developed by the World Bank to help enhance the analysis of public expenditure data. The BOOST initiative is a World Bank effort launched in 2010 to facilitate access to budget data. Currently deployed in about 40 countries, the BOOST approach provides a user-friendly platform where all expenditure data can be easily accessed. For more information, see http://boost.worldbank.org/boost-initiative

(APSC) and from the Bangladesh Bureau of Educational Information and Statistics (BANBEIS).[3]

The analysis shows that Bangladesh has made remarkable progress in expanding access to education, with sustained expansions in attendance rates for all levels of education. The number of out of school children 6-14 years old fell from about 5.5 million to three million children between 2010 and 2016, an impressive 45 per cent reduction in six years. The gains in access have recently been accompanied by improvements in the internal efficiency of the education system measured by reductions in drop-out rates and higher survival rates.

The progress has been broad based and reduced inequality, though more is needed. For instance, gender disparities fell both in terms of access and achievement. Today, at the primary and secondary levels, the focus should be on males, who are lagging in attendance. For females, more emphasis should be put on understanding and addressing constraints to achieve tertiary education. In addition, expansions in access have reduced disparities between the poor and non-poor children and across regions. Attendance rates in Sylhet have been increasing rapidly, especially since 2010, reducing its historical disadvantage compared to other divisions. Yet, there are visible gaps in school attendance by poverty status and region, which indicate that human capital disadvantages for the poor and some regions will persist for some time, unless progress accelerates.

The gains are partly the result of expansions in spending on education, led by households. Even though the share of households spending on education has been relatively constant over time, the amounts spent on education by households grew substantially. The average real annual growth in households' education spending was 9 per cent over the 2000-2016 period. GoB spending per student in real terms increased, but mainly at the tertiary level.

More progressive public and private spending supported the reduction in education disparities. GoB spending, particularly at the primary level, has become more progressive. Stipend programmes and tuition waivers help improve the progressivity of public spending, but mainly for the primary subsector. In addition, households' private spending increased faster for children with fewer resources. Therefore, while in 2000 the top quintile spent 22 times more on education per student than the poorest quintile, in 2016 the richest quintile spent only six times

[3] The analyses presented below were conducted to inform an ongoing Public Expenditure Review of the education sector. Analyses related to the quality of education, non-educational investments in learning outcomes (e.g., nutrition), or returns to education are not developed in this paper, as they are being carried out separately.

more than the poorest quintile. Yet, poor households still have substantially lower private spending on education than richer households. In 2016, the median household in the poorest quintile spent about Tk. 202 per student per month, compared to Tk. 1,310 per student for the median household in the richest quintile.

The next section summarises recent progress in school achievement and attendance rates, with a focus on understanding the extent to which this progress has been broad based and on highlighting remaining disparity challenges. Section III describes public and private spending patterns on education and the results from an incidence analysis of spending. Section IV explores the relationship between spending and outcomes. Section V concludes.

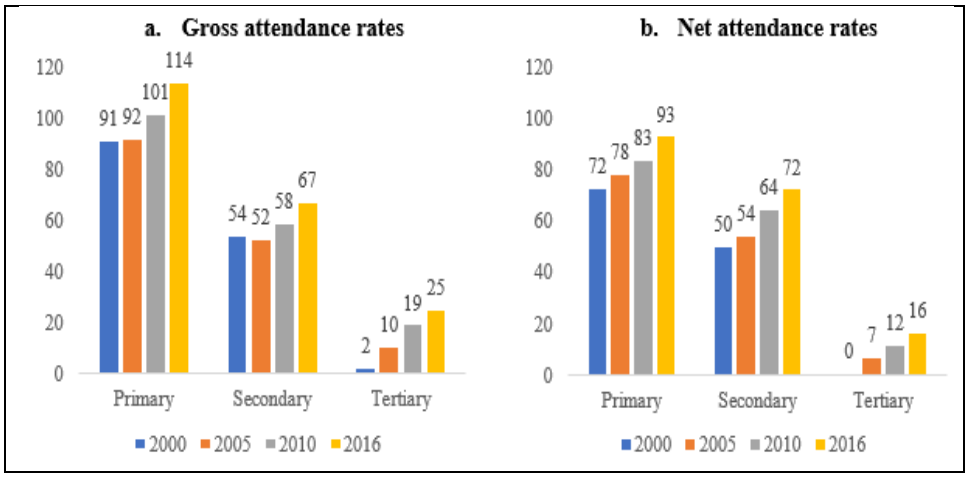
II. EQUITY IN OUTCOMES

During the past two decades, Bangladesh has made remarkable progress in expanding school attendance. Over the period 2000-2016, the primary gross attendance rate[4] increased from 91 to 114 per cent, and the secondary gross attendance rate rose from 54 to 67 per cent, while in tertiary gross attendance increased from 2 to 25 per cent (Figure 1). Also, over the same period, net attendance rates expanded by 20 percentage points for primary, 22 points for secondary, and 16 points for tertiary.

As access expanded, the number of out of school children fell significantly. In 2010, about 5.5 million children ages 6-14 years old were out of school. In 2016, this number was about three million children, a 45 per cent reduction in six years.

[4] The HIES only collects information on whether the person is currently attending school, therefore these figures will be lower than official enrolment rates. Gross attendance rates in primary are defined as the ratio between the number of students attending primary and the number of students age 6-10. The gross attendance rates in secondary is calculated as the ratio between the number of students attending secondary and the number of students age 11-17. The gross attendance rate in tertiary is calculated as the ratio between the number of students attending a level above secondary and the number of students age 18-22. Net attendance rates for primary are calculated as the percentage of children 6-10 attending primary. For secondary, the net attendance rate considers the population 11-17. For tertiary, the net attendance rate considers the population 18-22.

FIGURE 1: **Gross and Net Attendance Rates (%) by Education Level (2000-2016)**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

The gains in attendance have also been accompanied by improvements in the internal efficiency of the education system (Table I). For instance, between 2005 and 2017, for the primary level, repetition rates declined from 10 to 6 per cent, the cycle drop-out rate fell from 47 to 19 per cent, survival rates increased by more than 50 per cent, and the coefficient of efficiency rose by 21 points.[5] At the secondary level, there has also been an overall improvement on the same indicators.

[5] The repetition rate measures the rate at which pupils from a cohort repeat a grade. It is defined as the ratio between the number of repeaters in a given grade in a given school year (t+1) and the number of pupils from the same cohort enrolled in the same grade in the previous school year (t). The survival rate is the percentage of a cohort of pupils (or students) enrolled in the first grade of a given level or cycle of education in a given school year expected to reach successive grades, regardless of repetition. This rate is calculated following the UNESCO reconstruction cohort model. The coefficient of efficiency is an indicator of the internal efficiency of an educational system. It summarises the consequences of repetition and dropout on the efficiency of the educational process in producing graduates. It is defined as the ideal (optimal) number of pupil years required (i.e., in the absence of repetition and dropout) to produce a number of graduates from a given school cohort expressed as a percentage of the actual number of pupil years spent to produce the same number of graduates.

TABLE I
INTERNAL EFFICIENCY INDICATORS

	2005	2010	2016	2017
a. Primary level				
Repetition rate	10	13	6	6
Cycle drop-out rate	47	40	19	19
Survival rate	54	67	82	83
Coefficient of efficiency	61	62	81	82

Source: *Annual Primary School Students Census* (APSC) and Bangladesh Bureau of Educational Information and Statistics (BANBEIS).

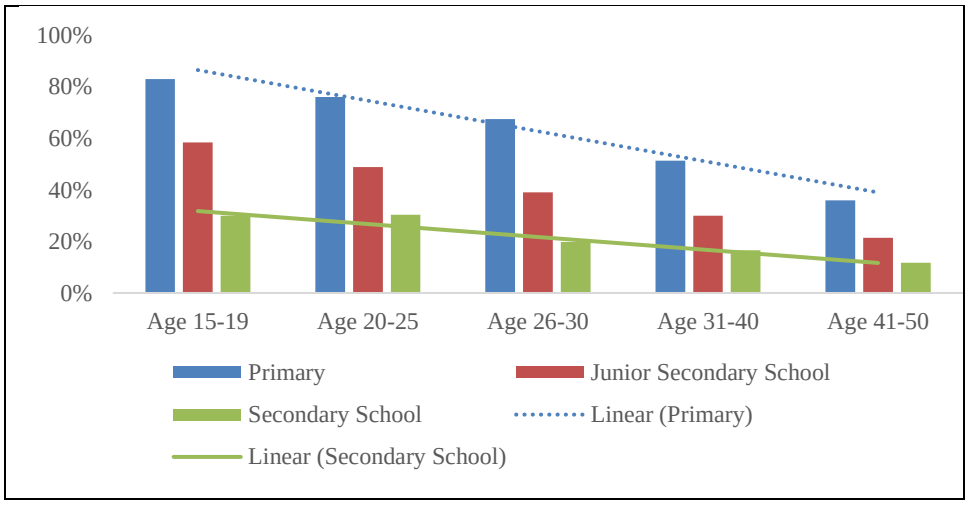
	2010	2016
b. Secondary level		
Repetition rate	4	3
Cycle drop-out rate	57	37
Survival rate	63	65
Coefficient of efficiency	50	73

Source: Bangladesh Bureau of Educational Information and Statistics (BANBEIS)

The sustained increase in education attainment over many years is changing the education profile of the adult population. Literacy rates for the adult population 15+ have improved from 46 per cent in 2000 to 63 per cent in 2016.[6] In addition, completion of at least primary school has increased from 30 per cent of adults in 2000 to 43 per cent in 2016. Completion of secondary (Grade 10) has expanded from 8 per cent in 2000 to 13 per cent in 2016. Progress is more evident when comparing across cohorts (Figure 2). While in 2016, 36 per cent of the population age 41-50 had completed primary education, 83 per cent of the population 15-19 had completed this level. Similarly, while 21 per cent of the population 41-50 achieved junior secondary, 58 per cent of the population 15-19 achieved this level.

[6] A person is considered literate if she can write a letter.

FIGURE 2: **Primary and Secondary School Completion Rates across Age Groups (2016)**

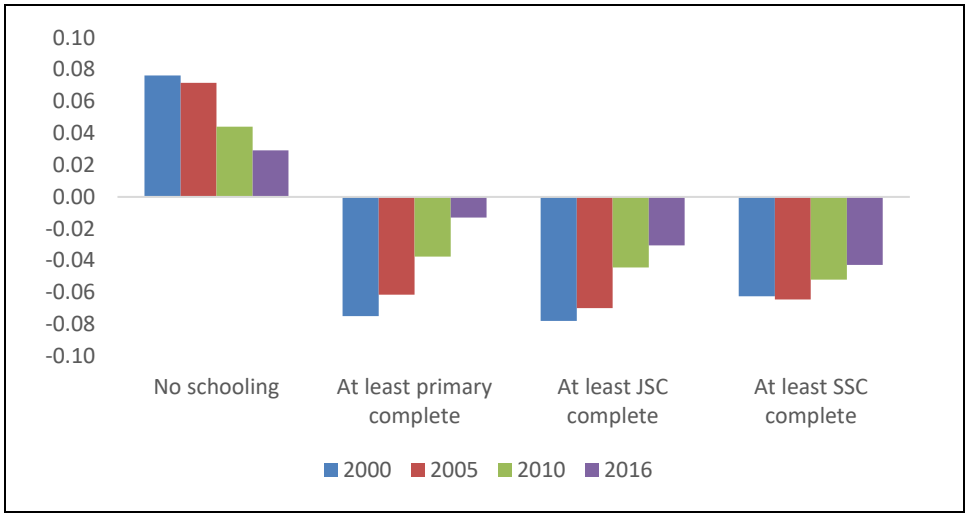


Source: Authors' calculations using *Household Income and Expenditure Survey* 2016/17.
Note: Junior Secondary School refers to completion of Grade 8. Secondary school refers to completion of Grade 10.

In addition, the expansions in schooling have been broad based and have reduced inequalities by gender, wealth, and across geographic regions. For instance, even though adult females are less educated than males overall, the new generations are reversing this disadvantage. Figure 3 presents the difference between the per centage of adult women and men achieving various levels of education and shows that gender disparities in school achievement have been declining with time. In 2000, 67 per cent of adult women had no schooling, compared to 60 per cent of men (seven percentage points difference); by 2016, this difference was three percentage points. The reduction in the gender gap has been large in terms of completing primary level, from a disadvantage of seven points for women in 2000 to only one point in 2016. The faster progress in women's education achievement shows that young men are now less likely to complete primary or secondary, though they still outperform females in tertiary (Appendix A, Figure A.1).

The rapid gains in attendance by females have resulted in males' now being the group lagging behind in primary and secondary school attendance. In 2016, girls' primary school attendance was two percentage points higher than that of boys' (Figure 4). This gap has not changed much from that observed in 2000. For secondary, attendance is higher for females, but the difference with males has been declining with time.

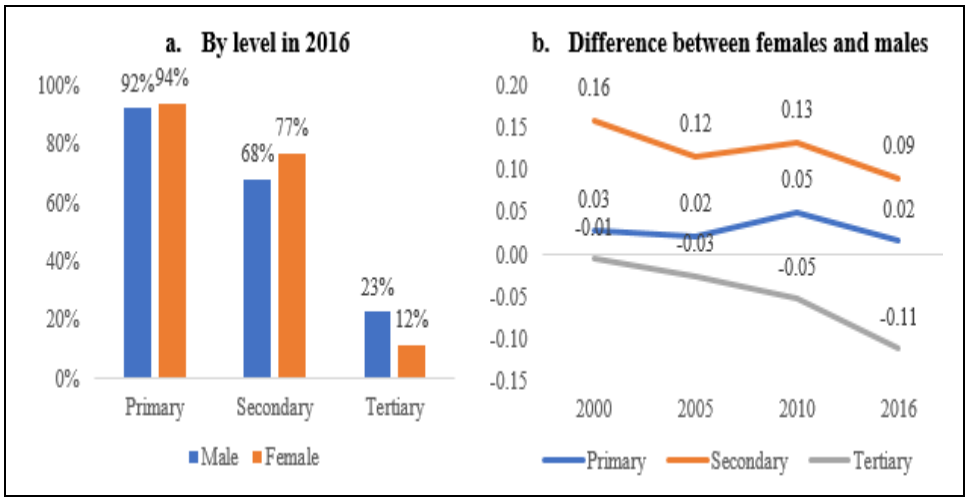
FIGURE 3: **Gap in School Achievement between Females and Males**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

Note: The bars present the difference between the share of women and share of men achieving an education level. JSC: Junior School Certificate; SSC: Secondary School Certificate.

FIGURE 4: **Attendance Rates by Gender**



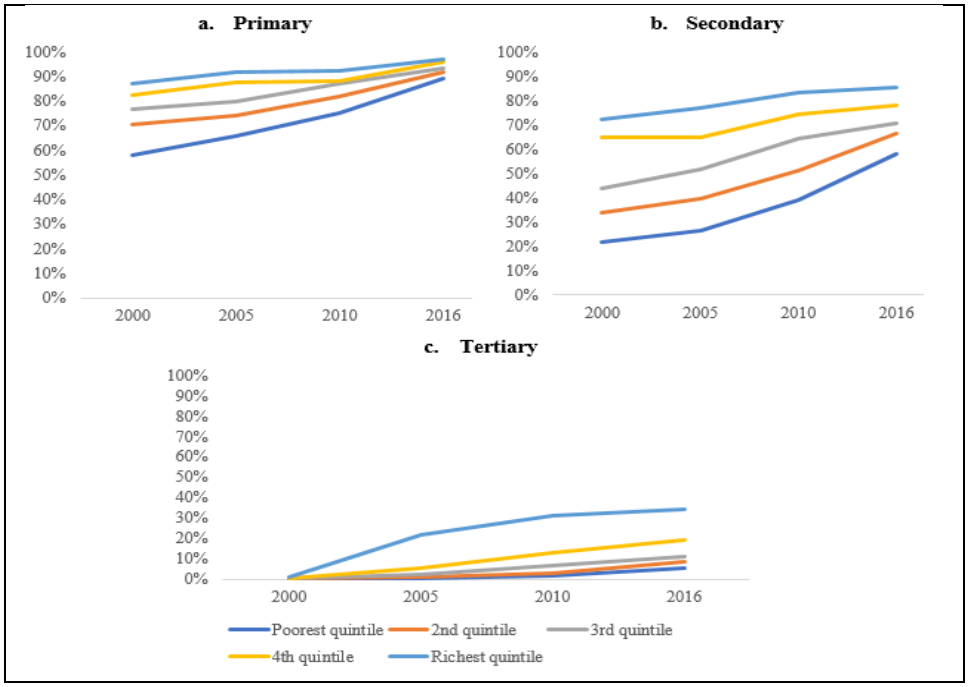
Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

Note: Figures represent net attendance rates.

Moreover, expansions in school attendance have been equalizing at the primary and secondary levels between poorer and richer children (Figure 5). In 2016, 89 per cent of children ages 6-10 in the poorest consumption quintile were attending primary school, compared to 97 per cent of children in the richest quintile, a 21-percentage point reduction in the gap between the poorest and richest quintiles since 2000. Differences in secondary school attendance across quintiles have also narrowed, though they are much larger than the ones observed at the primary level.

As school attendance has grown more rapidly among the poor, differences in school achievement have shrunk across consumption quintiles. In terms of literacy rates, in 2000, 27 per cent of the population 15+ years old living in poverty was literate, compared to 60 per cent of the non-poor (a 33-point gap). By 2016, the gap had fallen to 18 percentage points. Comparing across cohorts, there has been a reduction in the primary and secondary completion gaps between poor and non-poor, though the difference is still important (Appendix A, Figure A.2).

FIGURE 5: **Net Attendance Rates by Consumption Quintile, 2000-2016**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

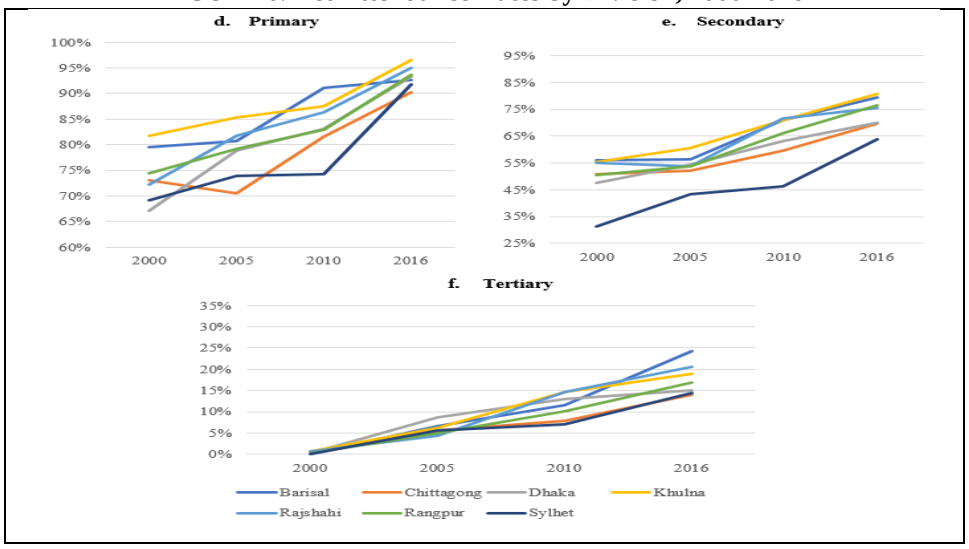
Note: Quintiles are defined based on household per capita consumption, deflated across space to account for differences in the cost of living across 16 different regions

There have also been faster gains in primary school attendance in lagging regions. In 2000, Dhaka division had the lowest attendance rates (67 per cent), followed by Sylhet division (69 per cent) (see Figure 6). The two divisions were far behind Khulna and Barisal, with 82 and 80 per cent attendance rates, respectively. By 2016, all divisions had net attendance rates above 90 per cent, ranging from 90 per cent in Chittagong to 97 per cent in Khulna. For Sylhet, Rangpur, Rajshahi, and Khulna, gains accelerated after 2010. However, in Barishal, progress slowed between 2010 and 2016. In Chattagram, faster progress started in 2005.

At the secondary level, there has also been substantial expansion in attendance rates accompanied by a reduction in disparities across divisions. Between 2000 and 2016, secondary attendance rates increased by more than 1 per cent per year on average across all divisions. Even though the increase in attendance was faster for lagging divisions, in 2016 there were still large gaps in attendance, with Sylhet at 64 per cent, compared to Khulna at 81 per cent.

Similarly, for the tertiary level, attendance rates have increased across the board, starting from less than 1 per cent in 2000. Between 2010 and 2016, Barisal and Sylhet divisions raised attendance rates by more than 50 per cent, followed by Chittagong (44 per cent) and Rangpur (about 40 per cent). Dhaka division showed the slowest increase over the 2010-16 period (13 per cent).

FIGURE 6: **Net Attendance Rates by Division, 2000-2016**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

Despite Progress, Challenges Remain

Roughly one in ten children ages 6-14 is still out of school. Out of school children are more likely to be male, live in urban areas, and come from the poorest households (Table II). Conditional regressions also highlight that children living in households with fewer resources and with less-educated adults are significantly more likely to be out of school (Appendix A, Table A.1). The higher likelihood that out of school children will live in an urban area is also reflected in slightly lower attendance rates in urban areas (93 per cent versus 91 per cent for primary school, and 73 per cent versus 70 per cent for secondary school).

TABLE II

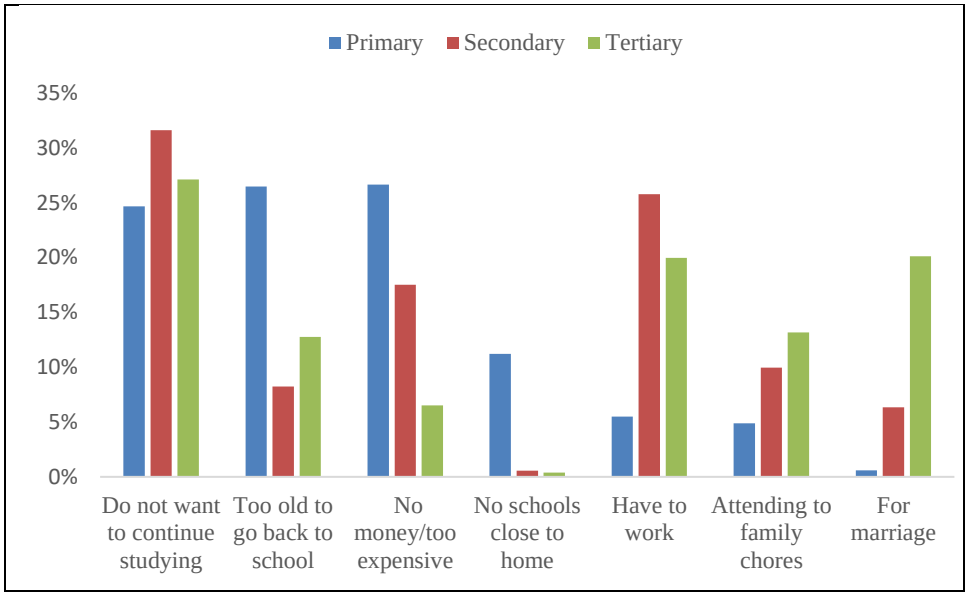
CHARACTERISTICS OF CHILDREN OUT OF SCHOOL

	Children 6-14 years old	
	In school	Out of school
All	91%	9%
Area		
Rural	76%	68%
Urban	24%	32%
Gender		
Female	50%	40%
Male	50%	60%
Quintile		
1	22%	35%
2	21%	26%
3	20%	19%
4	19%	12%
5	17%	8%

Source: Author's calculations using *Household Income and Expenditure Survey* 2016/17.

Improving primary school attendance will require efforts to increase the perceived value of education, in addition to overcoming resource constraints. Results using the Human Opportunity Index summarised in Appendix B indicate that children living in more educated households with more resources are more likely to attend school. However, according to HIES 2016, 51 per cent of households' report lack of interest or the children's age as the main reasons for not sending children to primary school (Figure 7). The next most widely cited reason is resource constraints (27 per cent of cases). Eleven per cent of respondents indicate that there are no schools near their homes. Understanding why households do not see value in education emerges as fundamental for tackling the problem of out of school children.

FIGURE 7: **Reasons for Not Attending School, by Level, 2016**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2016/17.

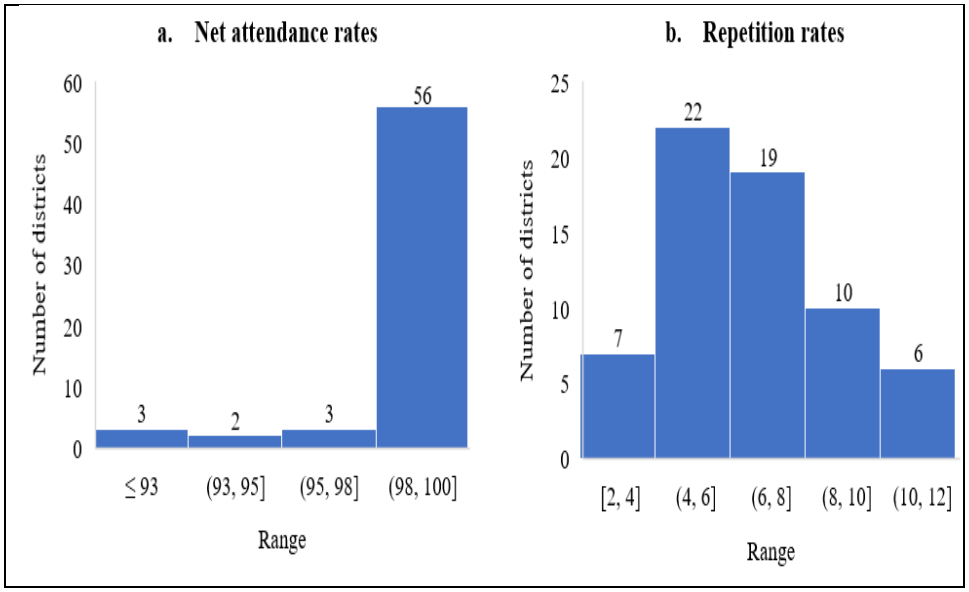
Moreover, as primary school attendance becomes universal, there is still room for improvement in other internal efficiency indicators. In the case of primary net attendance rates, 56 out of 64 districts in Bangladesh have net attendance rates above 98 per cent. However, in terms of repetition, survival, and dropout rates, there is significant variation across the territory, with some districts performing relatively well but many still at levels comparable to 2005 and 2010 national averages. For instance, 25 per cent of districts still have repetition rates above 8 per cent. Furthermore, survival rates from 59 to 93 per cent, dropout rates ranged from 8 to 47 per cent, and about 14 per cent of districts present a dropout rate above 28 (Figure 8).

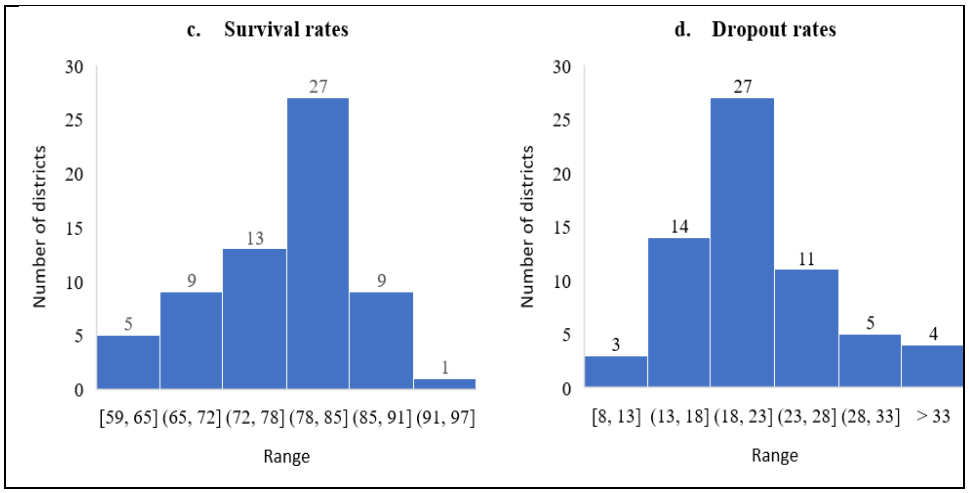
At the secondary and tertiary levels, higher and more equal access is still a major challenge. Gross attendance rates for tertiary level are about 25 per cent and, for the population ages 17-22, attendance rates are about 16 per cent. In 2016, only 30 per cent of the population 15-25 had completed secondary school. In addition, the rapid expansion in tertiary attendance rates has been led by males, which translates into an increasing difference in attendance by gender. In 2016, the attendance rate of women ages 17-22 was 12 per cent, compared to 23 per cent for men (Figure 4). Similarly, the gains in tertiary level attendance seen since 2000

have been largely driven by the top consumption quintiles. Across the country's districts, secondary net attendance rates vary widely, ranging from 59 to 87 per cent. In addition, about 30 per cent of districts present secondary net attendance rates below 71 per cent, and 14 per cent of them fall below 65 per cent. For the tertiary level, attendance rates vary significantly across districts, from 7 to 31 per cent (Figure 9).

Again, increasing the value that households see in education arises as an important avenue for greater attendance at higher education levels. For secondary school-aged children, 40 per cent of households cite lack of interest or being too old to go back as the main reasons for not attending. Work reasons follow (26 per cent), particularly for males (34 per cent of males compared to 14 per cent of females). Moreover, family chores and marriage become an important reason for women not to attend secondary school (cited by 30 per cent of women not attending). For tertiary-aged people not attending school, 40 per cent of respondents cite not wanting to go back or being too old. Work (for males) and marriage (for females) follow as main reasons (Appendix A, Table A.2).

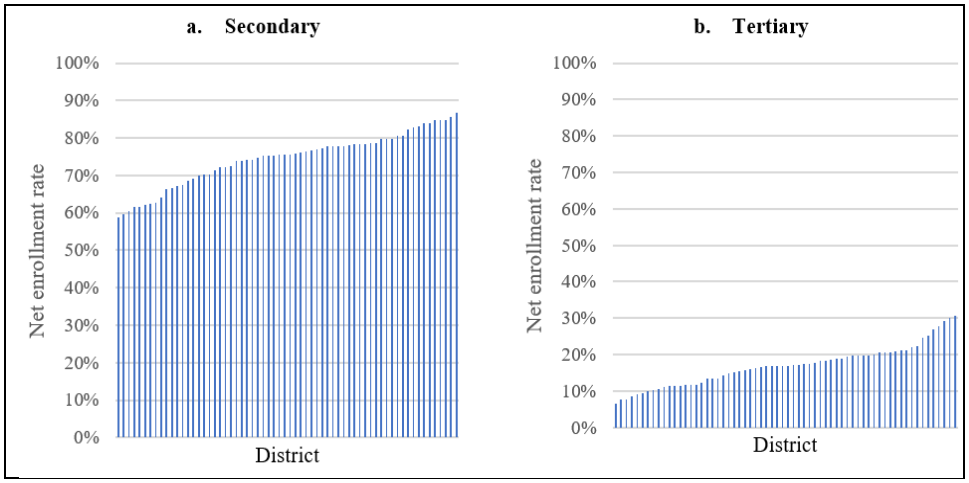
FIGURE 8: **Variation in Educational Outcome Indicators for Primary Level Across Districts (2016)**





Source: *Annual Primary School Students Census (APSC) 2016*.

FIGURE 9: **Net Attendance Rates in Secondary and Tertiary Across Districts (2016)**



Source: Authors' calculations using *Household Income and Expenditure Survey 2016/17*.

III. EQUITY IN SPENDING

3.1 The Equity of Public Spending on Education

This sub-section relies on budget data from BOOST for the fiscal year 2014 (FY14), the latest available, to study GoB spending patterns across groups and geographic areas. The analysis focuses on spending at the primary and secondary levels, since these are the two levels where the allocation of public spending can

be done at the district level with few assumptions.[7] The amounts presented are expressed in takas of 2016, unless specified otherwise. It is important to interpret these results with care, as GoB spending on education has been increasing since FY14. The relative comparisons across areas and groups are valid under the assumption that the distribution of spending has not changed significantly since the FY14.

The education system in Bangladesh is large and complex. It caters to approximately 17.3 million primary-level students (Grades 1-5), 13.9 million secondary-level students (Grades 6-12), and 4.5 million tertiary-level students. These students are served by 133,904 primary level institutions, 34,036 secondary level institutions, and 5,983 tertiary institutions (Table III).

TABLE III

NUMBER OF STUDENTS AND INSTITUTIONS BY LEVEL OF EDUCATION

Level	No. of students	(%)	No. of institutions	(%)
Primary (Grades 1-5)	17,251,568	(49.8)	133,904	(77.0)
Secondary (Grades 6-12)	13,878,242	(37.2)	34,036	(19.6)
Tertiary	4,513,119	(13.0)	5,983	(3.4)
Overall	*34,642,929*	*(100.0)*	*173,923*	*(100.0)*

Source: Bangladesh Bureau of Educational Information and Statistics (BANBEIS) *Education Statistics Report 2018.*

Note: Both secondary and tertiary levels include technical and vocational education (0.89 million students in 5,897 institutions).

There are two ministries responsible for overseeing the education system in the country—the Ministry of Primary and Mass Education (MoPME) and the Ministry of Education (MoE). MoPME handles pre-primary to Grade 5, as well as non-formal education, and MoE is responsible for secondary education (Grades 6-10), higher secondary education (Grades 11-12), technical and vocational

[7] The GoB expenditures included in the analysis are those reported by the Ministry of Primary and Mass Education (MoPME) and the Ministry of Education (MoE). Only categories related to primary and secondary education were included. For the expenditure items that could not be disaggregated at the district level, several types of expenditures were allocated uniformly based on either the share of students, teachers or institutions in each district. For instance, for the MoPME, about 22 per cent of the expenditures did not have a district code, 70 per cent of them corresponding to stipends. In this case, the amount was distributed based on the share of students receiving stipends in each district. For MoE, most of the unassigned expenditures correspond to teachers' salaries, which were allocated based on the share of teachers in each district.

education, madrasah education,[8] and tertiary education. MoE is responsible for policy formulation and allocating funding for tertiary education. The University Grants Commission (UGC) is responsible for coordinating university education, and for quality assurance of both public and private universities. Additionally, the National University (NU) is responsible for overseeing the large number of government and non-government colleges affiliated with it.

GoB education spending per student has been increasing in nominal terms during the past few years, but recent gains in real terms are seen mainly for the tertiary sector. The GoB has shown a strong commitment to the sustained improvement of the education sector with yearly increases in the budgetary allocations in the Medium-Term Macroeconomic Framework (MTMF). The annual budget allocated to the education sector has continuously increased in nominal terms in recent years. This expansion has been accompanied by an increase in spending per student in nominal terms for all levels (Table IV). In real terms, however, except for a substantial increase at the tertiary level, spending per student has either declined or increased only marginally (Table IV).

Furthermore, Bangladesh's spending on education is low compared with other countries in the region. Public expenditure on education as a share of the gross domestic product (GDP) was only 2.2 per cent in 2015. Apart from Sri Lanka, all other countries in South Asia spent significantly more on education than Bangladesh in 2015 (UNESCO Institute for Statistics 2018). Similarly, Bangladesh ranked second from the bottom in the region in terms of the share of the national budget devoted to education (11.7 per cent). The Incheon Declaration, adopted in May 2015 by many multilateral organisations, including the World Bank, and participants from 160 countries during the World Education Forum, urged countries to devote at least 4 to 6 per cent of GDP and/or at least 15 to 20 per cent of public expenditure to the education sector to improve educational outcomes. Bangladesh is still far below these targets.[9] At the primary and secondary levels, spending per student as a percentage of GDP per capita is much smaller than the average for OECD countries and lower than the figures for other countries in the region (Table V). The low spending on education imposes severe constraints on improving both the quality and quantity of education services.

[8] Islamic religious education.

[9] According to the figures from the Bangladesh Ministry of Finance (MoF), the education budget as a share of the total budget has been lower than 15 per cent since 2008 and has not exceeded 2.5 per cent as a share of GDP since 2000. The seventh five-year plan of GoB envisions increasing the allocation to education to at least 3 percent of GDP, but even this vision falls significantly short of the recommendation made by the Incheon Declaration.

TABLE IV

PER STUDENT PUBLIC SPENDING ON EDUCATION BY LEVEL

Level of Education	2010-11	2012-13	2013-14	2014-15	2015-16
a. Annual in nominal terms (takas)					
Primary (Grades 1-5)	4,728	4,676	5,017	7,173	7,213
Junior Secondary (Grades 6-8)	4,788	5,358	4,781	5,761	6,497
Secondary (Grades 9-10)	8,578	8,134	7,794	9,155	9,598
Higher Secondary (Grades 11-12)	17,100	9,826	15,383	16,603	20,872
Tertiary	11,066	13,272	15,186	16,035	20,924
Level of Education	2010-11	2012-13	2013-14	2014-15	2015-16
b. Annual in 2016 takas					
Primary (Grades 1-5)	6,468	5,604	5,616	7,572	7,213
Junior Secondary (Grades 6-8)	6,552	6,420	5,352	6,072	6,497
Secondary (Grades 9-10)	11,736	9,756	8,736	9,660	9,598
Higher Secondary (Grades 11-12)	23,400	11,784	17,232	17,520	20,872
Tertiary	15,144	15,912	17,016	16,920	20,924

Source: Authors' calculations using Bangladesh Bureau of Educational Information and Statistics (BANBEIS) for education per student costs and *World Development Indicators* (WDI) for inflation adjustment.

TABLE V

GOVERNMENT EXPENDITURE PER STUDENT (% OF GDP PER CAPITA)

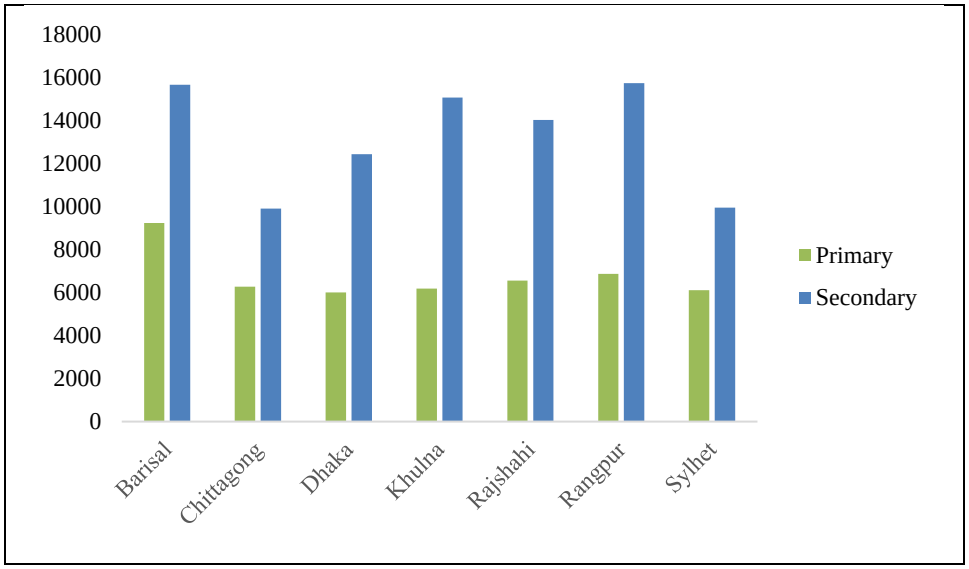
Country	Primary	Secondary	Tertiary
Bangladesh	9.0	10.0	25.0
Bhutan	14.0	32.0	55.0
India	10.0	17.0	49.0
Maldives	15.0	..	29.0
Nepal	13.0	11.0	25.0
Pakistan	10.0	11.0	27.0
Sri Lanka	11.0	11.0	30.0
OECD members	20.0	23.0	26.0

Source: *World Development Indicators* circa 2016.

Note: Government expenditure per student is the average general government expenditure (current, capital, and transfers) per student in the given level of education, expressed as a percentage of GDP per capita.

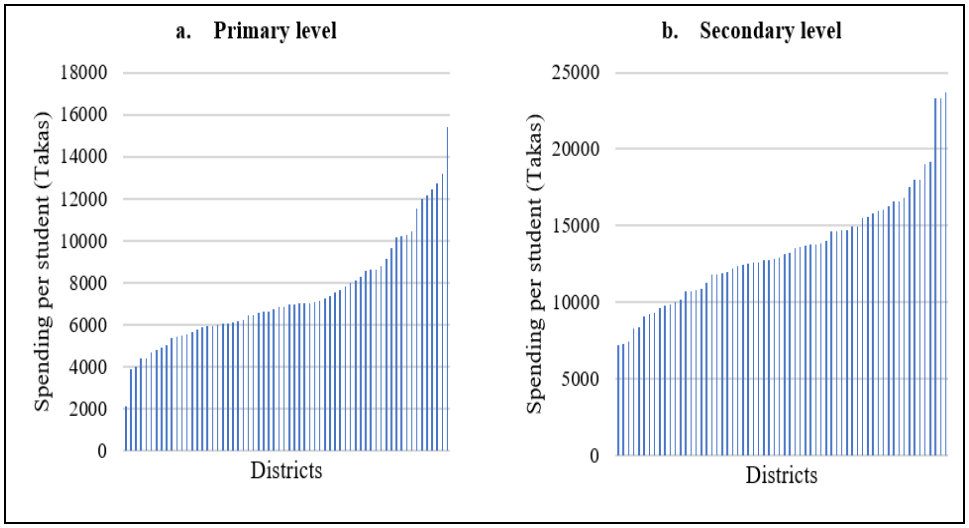
At the same time, across the country, there is a large variation in the levels of spending per student. For the primary level in FY14, Barisal division presented the highest levels of public spending per student (approximately Tk. 9,237 in 2016 prices), while Dhaka had the lowest (Tk. 6,014 in 2016 prices). For secondary, the divisions of Barisal and Rangpur received the highest spending per student (about Tk. 15,000), while Sylhet and Chittagong divisions had the lowest spending per student (about Tk. 9,900) (Figure 10). At the district level for primary, Dhaka was the district with the lowest spending per student (Tk. 2,114), while districts like Jhalokathi in Barisal division and Joypurhat in Rajshahi division had spending per student of more than Tk. 13,000. A similar pattern is found in secondary, with costs per student ranging from about Tk. 7,000 to Tk. 23,000 (Figure 11).

FIGURE 10: **Public Spending per Student by Division**



Source: Authors' calculations from *BOOST* for fiscal year 2014.
Note: Annual amounts in 2016 takas.

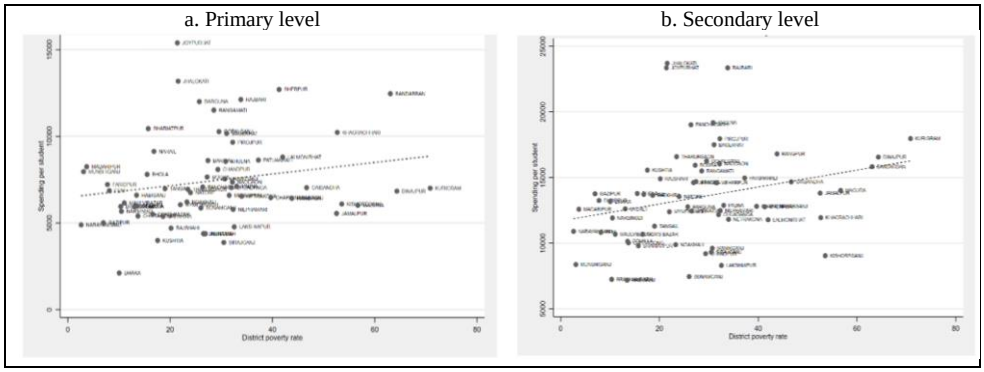
FIGURE 11: **Spending per Student Across Districts**



Source: Authors' calculations using BOOST for fiscal year 2014.
Note: Annual amounts in 2016 takas.

GoB spending per student tends to be higher in poorer districts of the country. There is a statistically significant correlation between GoB spending per student and poverty rates at the district level. For primary and secondary, the correlation is 22 per cent and 30 per cent, respectively. However, there are areas with similar levels of poverty and very different levels of spending per student (Figure 12), suggesting that pro-poor targeting is only one element behind budget allocations.

FIGURE 12: **Relationship between Spending per Student and Poverty at the District Level**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2016 and *BOOST* for the fiscal year 2014.
Note: District poverty measured using official upper poverty line. Spending in 2016 takas.

GoB spending for the primary level is pro-poor and has been increasing its progressivity with time. An incidence analysis indicates that the distribution of GoB spending at the primary level is pro-poor. Table VII shows that 30.7 per cent of primary school age children who are poor receive 35 per cent of public primary education expenditures. In 2005, half of the primary school age population was classified as poor, but those students received 47 per cent of public primary recurrent expenditures (World Bank 2010). A similar analysis for 2000 showed that 59 per cent of primary school age children were living in poverty, but only 56 per cent of primary education expenditures accrued to this group (Glinskaya 2005). The gains in progressivity reflect the expansion in primary school attendance in combination with specific cash programmes targeted to the poor (i.e., stipends and tuition waivers).

Stipend programmes improve the progressivity of public spending at the primary level. The Primary Education Stipends Programme (PESP) supports all primary schools by providing stipends to students in Grades 1-5. To qualify for the stipend, students must maintain 85 per cent monthly attendance, take all the school

examinations, and attain a minimum of 33 per cent in exam marks for each of the subjects of a class, with certain exceptions. The programme used to target children from poor families, but as of 2015-16, it became universal.

Even though the primary stipend programme is pro-poor, its coverage is still not universal. At present (2016-17), as many as 11.1 million primary students are being covered by the PESP, about 60 per cent of the primary students enrolled in Grades 1-5. There is a positive and statistically significant relationship (β=0.25; T-stat=2.31) with district poverty, indicating that poorer districts tend to have a larger share of primary students receiving stipends. However, according to HIES 2016, even though children in the poorest quintiles are more likely to receive stipends (30 per cent of recipients come from the poorest 20 per cent of households), about 22 per cent of non-recipients belong to the poorest quintile (Table VI).

TABLE VI

CHARACTERISTICS OF STUDENTS RECEIVING STIPENDS IN 2016

	Primary level		Secondary level	
	Recipient	Non-recipient	Recipient	Non-recipient
Area (%)				
Rural	94	71	85	72
Urban	6	29	15	28
Gender (%)				
Female	52	47	71	47
Male	48	53	29	53
Quintile				
1	30	22	21	13
2	25	21	21	17
3	20	20	20	20
4	15	19	23	23
5	9	17	16	27

Source: Authors' calculations from *Household Income and Expenditure Survey 2016/17*.

Primary stipends are an important source of funding, compared to the spending of households, though the size of the transfer has been fixed since 2002. The benefit of the PESP stipend has been fixed at Tk.100 per month since the beginning of the programme. Still, the size of the benefit represents about a third of the private spending of a median household in 2016, and about 70 per cent of the private spending of households in the poorest quintile.

For the secondary education subsector, the distribution of GoB spending lags in terms of reaching the poor, as they are less likely to attend this level (Table VII). For the secondary level, the share of public spending going to the poor and the poorest quintiles is lower than the share of secondary school-age children in those categories. While about 24 per cent of the secondary-age children are considered poor, they receive about 22 per cent of public spending in secondary education. These patterns result from the fact that children in poorer families are less likely to attend secondary school, therefore they do not benefit from GoB spending. Conditional on attending secondary school, the share across consumption quintiles is very similar to the share of students in each quintile.

In addition, despite an effort to reach the poorest students, there is a weak relationship between poverty and stipends distribution for the secondary level. Secondary stipends are more likely to benefit females (71 per cent of recipients are female), and the recipients are more likely to live in rural areas (Table VI). Recipients come from different consumption quintiles, with only 20 per cent belonging to the poorest quintile. The higher likelihood of women receiving stipends reflects the previous emphasis of the programme on incentivizing female secondary school attendance, though currently the programmes have a pro-poor targeting strategy aiming to reach both females and males.

Finally, tuition waivers are distributed in a way comparable to stipends, and there is room to improve their progressivity. According to HIES 2016/17, about 10 per cent of students received tuition waivers, more than half of primary school students and a quarter of secondary students (Table VIII). About 83 per cent of recipients attending primary school live in rural areas, and 52 per cent of them are female. Again, tuition waivers tend to benefit the poorest children in primary school, however one in four beneficiaries belongs to the richest 40 per cent of the consumption distribution. For secondary, recipients are significantly more likely to be female, and they come from all consumption quintiles.

TABLE VII

INCIDENCE OF PUBLIC EDUCATION EXPENDITURE

Group	Primary level		Secondary level	
	Share of children	Share of public expenditure	Share of children	Share of public expenditure
Upper poverty				
Non-poor	69.3	65.1	76.0	77.7
Poor	30.7	34.9	24.0	22.3
Consumption quintile				
1	25.6	29.1	19.5	17.5
2	22.2	24.1	19.6	20.0
3	19.9	20.3	20.3	20.8
4	17.7	15.5	20.2	21.7
5	14.7	11.0	19.6	20.0

Source: Authors' calculations using *Household Income and Expenditure Survey 2016* and *BOOST* the for fiscal year 2014.

TABLE VIII

CHARACTERISTICS OF STUDENTS RECEIVING TUITION WAIVERS

	Primary level (%)		Secondary level (%)	
	Recipient	Non-recipient	Recipient	Non-recipient
Area				
Rural	83	69	85	71
Urban	17	31	15	29
Gender				
Female	52	48	66	48
Male	48	52	34	52
Quintile				
1	28	21	21	13
2	25	19	23	17
3	21	19	20	20
4	16	21	21	23
5	10	20	16	27

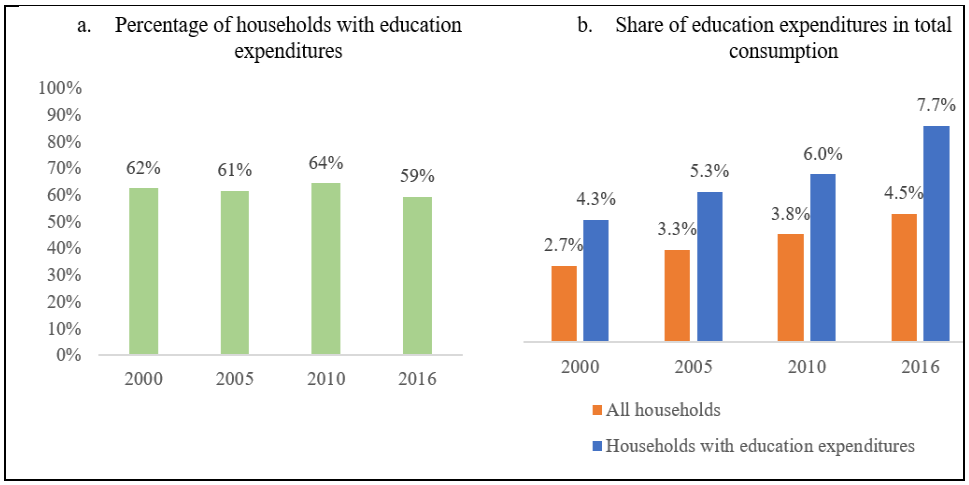
Source: Authors' calculations using *Household Income and Expenditure Survey 2016/17.*

3.2 Households' Expenditures on Education

The growth in consumption and incomes and the poverty reduction observed in the last two decades have been accompanied by an increased importance of education expenditures in households' budgets. In 2016, about six in ten Bangladeshi households reported incurring education expenditures (Figure 13). The percentage of households with education expenditures has been around 60 percent since 2000, except in 2010, when it was slightly higher (64 per cent). Even

though the share of households' spending dedicated to education has been relatively constant over time, the amounts spent on education have grown substantially. In 2016, the median household spent Tk. 802 per month on education, about Tk. 516 per child. This represents an increase of more than 148 per cent in real terms from the amounts observed in 2000, and a rise of about 47 per cent since 2010. The average real annual growth in households' education spending was 9 per cent over the 2000-2016 period. Conditional on spending on education, the percentage of education expenditures in households' total consumption has also been rising, from 4.3 per cent in 2000 to 6 per cent in 2010, reaching 7.7 per cent in 2016.

FIGURE 13: **Households' Education Expenditures, by Year**



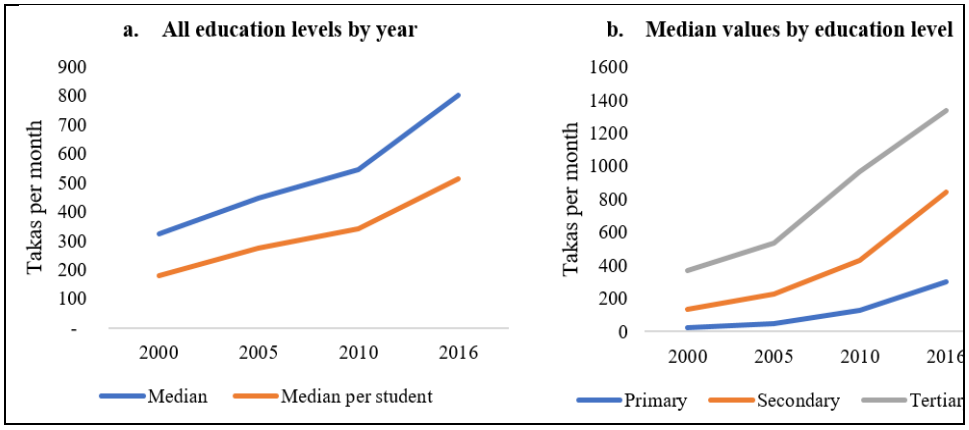
Source: Authors' calculations using *Household Income and Expenditure Survey* 2000-2016/17.

The rise in households' expenditures is observed for all levels of education, with the fastest growth seen for primary. Between 2010 and 2016, median expenditures for primary education increased from Tk. 128 to Tk. 300 per month (135 per cent in real terms) (Figure 14). For secondary, the increase was 95 per cent, and for tertiary it was 38 per cent.

The expansions in private spending were accompanied by a reduction in the spending gap between poor and richer households. While, in 2000, the top quintile spent 22 times more on education per student than the poorest quintile, in 2016, the richest quintile spent only six times more than the poorest quintile. Therefore, inequality in the distribution of private education expenditures has been substantially decreasing. The Gini coefficient for education expenditures declined

from 0.81 to 0.74 between 2000 and 2016. Considering only households with positive education spending, the fall in inequality measured by the Gini was 12 points, with more than half of the change observed between 2010 and 2016 (Figure 15).

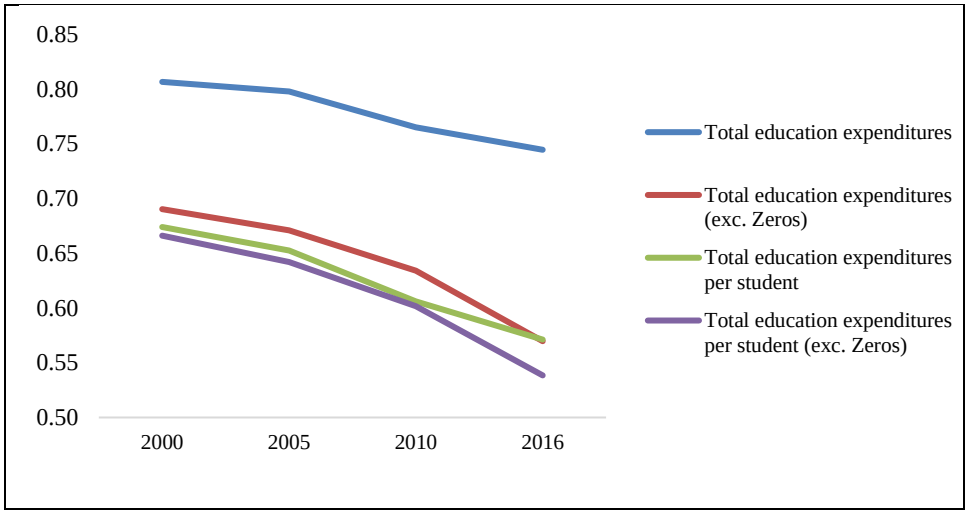
FIGURE 14: **Median Expenditures on Education per Month (in 2016 takas)**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

Note: The figures are calculated for households that report positive education expenditures. Figures in 2016 prices, deflated spatially to account for differences in cost of living across the country.

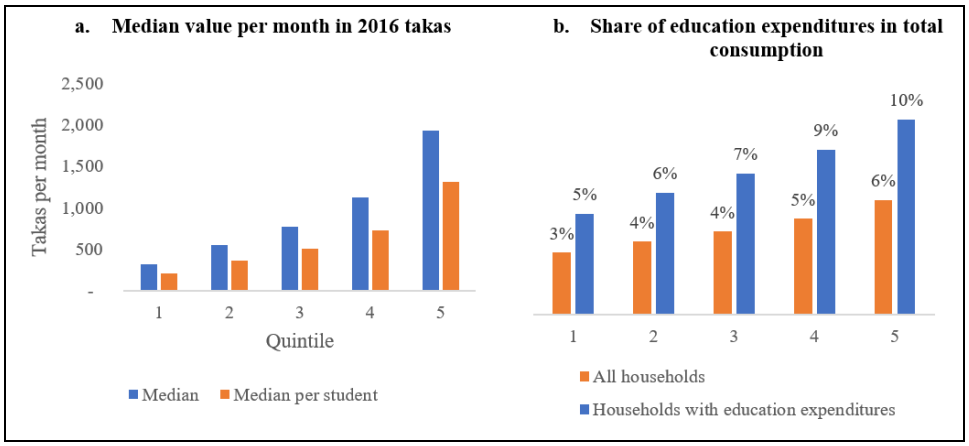
FIGURE 15: **Gini Coefficient for Household Education Expenditures, by Year**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016/17.

Yet, poor households have substantially lower private spending on education than richer households. Comparing across consumption quintiles, the percentage of households that are spending on education is quite even; in 2016, it ranged from 62 per cent of households in the poorest quintile to 59 per cent of households in the richest quintile (Figure 16). However, in 2016, the median household in the poorest quintile spent about Tk. 315 per month on education (Tk. 202 per student), compared to Tk. 1,933 (Tk. 1,310 per student) for the median household in the richest quintile. The lower spending of the poor also translates into a lower budget share. While the poorest quintile allocated 5 per cent of their total consumption to education, the richest allocated 10 per cent of total consumption.[10]

FIGURE 16: **Education Expenditures by Quintile**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010 and 2016/17.

Households' private spending on education is mainly allocated to cover school fees, books, and tutoring. On average, in 2016, households spent about 20 per cent on fees, 23 per cent on books, 26 per cent on private tutoring, 4 per cent on transportation, and a remaining 27 per cent on miscellaneous items (including uniforms, internet, tiffin costs, accommodation, etc.) (Table IX). Across levels, fees gain importance in higher levels of education (16 per cent in primary, 19 per cent in secondary, rising to 31 per cent in tertiary). Tutoring has more importance in secondary (about 31 per cent of total spending). In addition, transport costs are most important in tertiary (10 per cent of total spending).

[10] This is conditional on having positive education expenditures.

The share of expenditures allocated to fees, tutoring, and transportation increases for households with more resources, while the share allocated to books decreases for richer households (Figure 17). Across education levels, books comprise about a third of the budget spent on education for the poorest quintile. At the tertiary level, the spending patterns across quintiles become more similar, as expected, since this is conditional on attending higher levels of education.

Again, the median amounts spent on fees, books, tutoring, and other items are substantially lower for the poor. For instance, in 2016, the bottom 20 per cent spent about Tk. 21 per month in fees, about half what is spent by the next quintile, and about 6 per cent of the median household in the richer quintile. These gaps are observed across all three levels of education (Appendix Table A.3).

TABLE IX

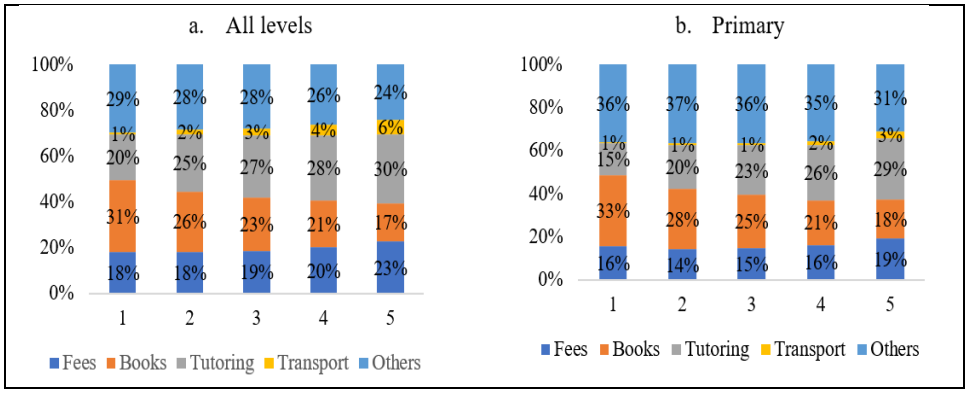
DISTRIBUTION OF EXPENDITURES BY TYPE HIES 2016/17

Education level	Spending category (%)				
	Fees	Books	Tutoring	Transport	Others
All	20.0	23.0	26.0	4.0	27.0
Primary	16.0	25.0	22.0	1.0	35.0
Secondary	19.0	24.0	31.0	3.0	23.0
Tertiary	31.0	21.0	19.0	10.0	18.0

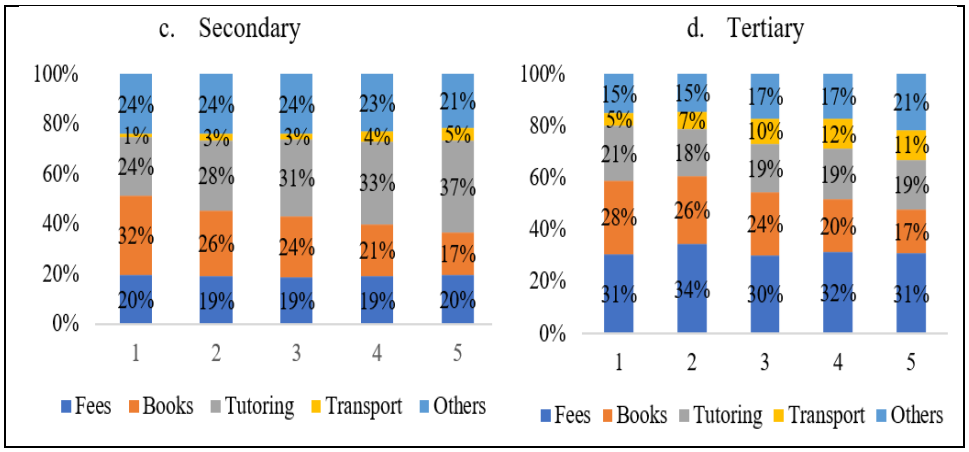
Source: Authors' calculations using 2016/17 *Household Income and Expenditure Survey.*

Note: Fees include expenditures on admission, annual sessions, registration, examination, and tuition. Books include text, note, and exercise books and stationery. Tutoring includes private tutoring and coaching. Other expenditures include uniforms, footwear, hostel, tiffin, internet/e-mail, schooling donation, and others.

FIGURE 17: **Distribution of Expenditures by Type Across Consumption Quintiles**



(Contd. Figure 17)



Source: Authors' calculations using *Household Income and Expenditure Survey 2016*.

Part of the difference in private spending patterns between poorer and richer households can be attributed to the type of school attended by children, though government funded institutions are dominant at all education levels. Approximately 57 per cent of primary institutions in the country are government schools, fully financed and managed by MoPME (APSC 2017). The remaining primary institutions are mostly non-government funded and privately managed. According to HIES 2016, 84 per cent of children of primary-age school attend a government school or a private government-subsidized institution, and about 9 per cent of children go to a private non-government-subsidized school (Figure 18). Children in poorer households are more likely to attend government schools. While only 4 per cent of children in the poorest consumption quintile attended a private non-government-subsidized school in 2016, this was true for 18 per cent of children from the richest quintile (Appendix Table A.4).

At the secondary level (Grades 6-10), most of the schools are publicly subsidized and privately managed. In 2017, 98 per cent of the secondary institutions were under private management, and 82 per cent of these non-government secondary schools received Monthly Pay Orders (MPOs) from the government for the payment of teacher salaries (BANBEIS 2018). Therefore, approximately nine in ten secondary-age school children attend a government or government-subsidized private school. Given the dominance of these schools in providing secondary education, there are no major differences in the type of school attended across consumption quintiles. Only children belonging to the richest

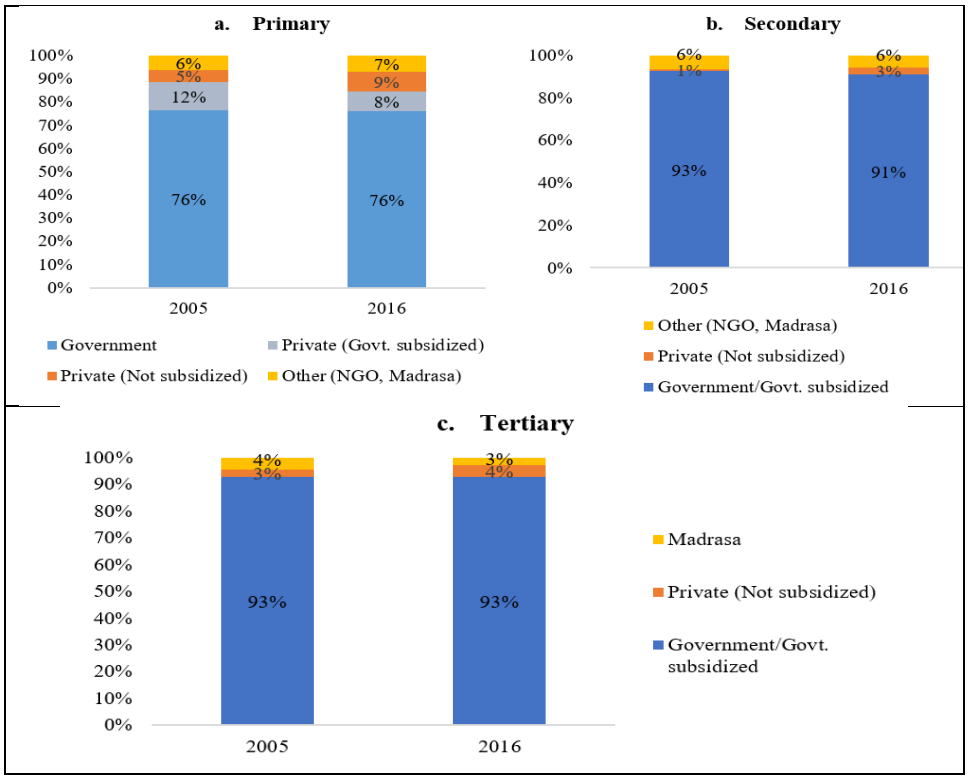
quintile are more likely to attend private non-government subsidized schools (5 per cent compared to 3 per cent in the other quintiles).

Similarly, most technical and vocational education and training (TVET) and tertiary institutions receive some government funding or subsidies. Public-sector TVET institutions, which enrol around 22 per cent of the TVET student population, are fully financed by the government. In addition, many private TVET institutions receive subsidies from the government, mainly in the form of MPOs for teacher salary payments and through grants from donor-supported government projects. At the tertiary level, public universities, which enroll around 25.5 per cent of the total student population, are fully supported by government funds. Government colleges affiliated to the National University (NU), enrolling 37.9 per cent of total tertiary level students, also receive full funding from MoE. Non-government colleges, on the other hand, are largely privately funded and generate around 80 per cent of their income from student fees. But they also have access to some public funds in the form of MPOs for teacher salaries and through donor-funded government projects. Students are charged nominal tuition and examination fees in government higher secondary schools, government TVET polytechnics, public universities, and NU affiliated government colleges. Private institutions charge substantially higher fees at all levels.

For tertiary, most students attend a government-subsidized private school (55 per cent) or government schools (38 per cent). Students with more resources are significantly more likely to choose private (not subsidized) schools: 7 per cent of students in the richest quintile do so, compared to 1 per cent of those in the poorest quintile (Appendix Table A.4).

Compared to a decade ago, there has been an increase in the share of children attending private schools. According to HIES, between 2005 and 2016, the share of students attending private institutions increased by around four percentage points for primary, two percentage points for secondary, and one percentage point for tertiary. The expansions in private schooling have been observed for all consumption quintiles and were faster for the middle quintiles (Appendix Table A.4).

FIGURE 18: **Type of School Attended, 2005-2016**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2005 and 2016/17.

3.3 The Role of Public Spending in Total Spending

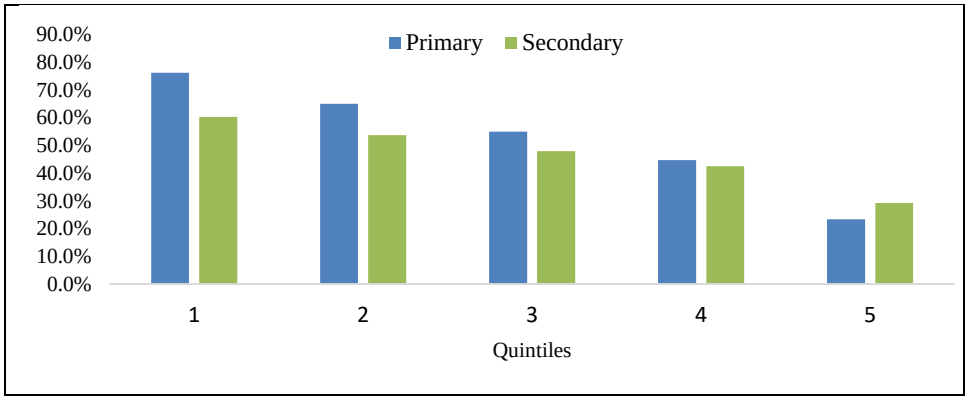
Public spending contributes a large share of total education expenditures, particularly for the primary level. Estimations combining HIES and BOOST indicate that, for the median child in primary school, about 57 per cent of total spending comes from public resources. For secondary, the portion publicly funded is 43 per cent.

Consistent with the incidence analysis presented above, public spending has a larger importance for poorer children. For primary, about 76 per cent of the education expenditures of the median households in the bottom 20 per cent of the consumption distribution come from public resources, compared to 23 per cent for the richest 20 per cent of the consumption distribution (Figure 19). For secondary, public expenditures represent 60 per cent of total expenditures for the median

households in the bottom 20 per cent, compared to 29 per cent for the richest 20 per cent.[11]

Therefore, public spending helps reduce the education spending gap between poor and rich households. For instance, in 2016, the richest quintile spent about 7.5 times more per student in primary, compared to the poorest quintile (Table X). When public spending is added, the richest quintile spends about two times more than the poorest quintile. For secondary, the ratio between mean expenditures per student between the richest and poorest quintiles declines from 11.4 to 8.4 times, when public spending is added.

FIGURE 19: **Share of Public Expenditure Over Total Education Expenditure, by Quintile**



Source: Authors' calculations using *Household Income and Expenditure Survey 2016* and *BOOST* for the fiscal year 2014.

Note: Total education expenditure includes public and households' expenditures. The figures presented are medians by group.

TABLE X

TOTAL EDUCATION EXPENDITURES PER STUDENT, MEDIAN TAKAS PER MONTH

Group	Primary		Secondary	
	Private	Private and public	Private	Private and public
All	204	616	417	1,183
Consumption quintile				
1	82	494	107	249
2	153	568	279	730
3	246	648	426	1,078
4	355	719	669	1,485
5	605	942	1,225	2,090

Source: Authors' calculations using *Household Income and Expenditure Survey 2016* and *BOOST* for the fiscal year 2014.

Note: Private denotes the households' expenditures net of stipends which are included in public spending. Private and public also include the spending from GoB. Amounts in 2016 takas.

[11] Caveat: These shares are slightly underestimated, as the information from BOOST comes from FY14. Yet, the qualitative comparisons across groups should be adequate.

IV. RELATIONSHIP BETWEEN SPENDING AND OUTCOMES

The previous section highlights that overall spending has been growing, while inequalities are shrinking between poor and non-poor children. This section explores how strong the cross-sectional relationship between levels of spending and outcomes is. For primary level, the outcomes analysed are attendance rates and internal efficiency indicators. For secondary, the analysis only focuses on attendance rates, due to other indicators not being readily available at the district level. Even though this analysis is not intended to explain the impact of more resources on education outcomes, the district-level analysis provides a more nuanced picture of their relationship. It should be noted, however, that an analysis of performance within districts, ideally at the school level and across time, would be needed to get a better picture of the challenges in delivering better education outcomes. Unfortunately, the information available does not allow for such detailed analysis.

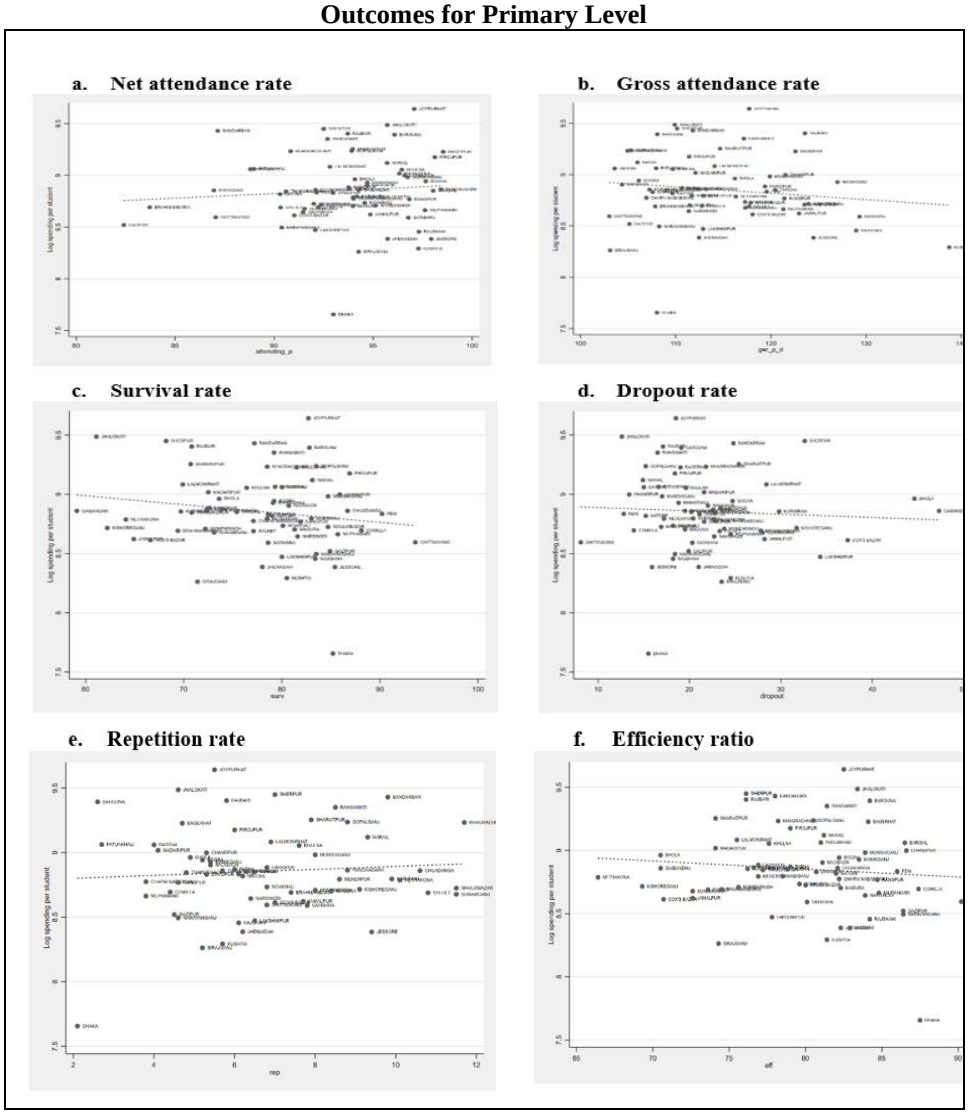
Despite improving attendance to primary education, Bangladesh's pro-poor spending is not strongly correlated with better overall education outcomes. At the primary level, total public spending per student is not statistically correlated with key performance and internal efficiency outcomes (Figure 20). A district-level analysis shows that total GoB spending per student is not associated with repetition rates, survival rates, efficiency ratio, dropout rates, or gross attendance rates. Only for net attendance rates is the relationship positive and significant at the 10 per cent significance level.[12] Appendix Table A.5 presents a series of ordinary least squares (OLS) regressions, where the correlation between outcomes and spending per student for the primary level is conditioned by the size of the district population, the share of rural population, the poverty rate, and literacy rates. These multivariate regressions confirm that differences in levels of public spending do not explain variation in outcomes across districts.

However, the student-to-teacher ratio arises as a more significant correlate of these outcomes. Having more students per teacher significantly explains differences in survival rates, dropout rates, and the efficiency ratio across districts. Multivariate regressions also indicate that the ratio of students per teacher emerges

[12] It is important to keep in mind that this analysis presents a cross-sectional correlation between spending and outcomes and cannot inform about the effectiveness of increased spending on outcomes across time. The weak relationship could be explained by the fact that spending is going to groups and areas that are lagging and have relatively worse outcomes. The controls in the multivariate regressions may not completely address this fact.

as a much stronger correlate of outcomes. In addition, household private education per student correlates with lower repetition rates, a higher efficiency ratio, and lower dropout rates. However, this correlation losses significance, once we control for literacy, poverty, and share of rural population.

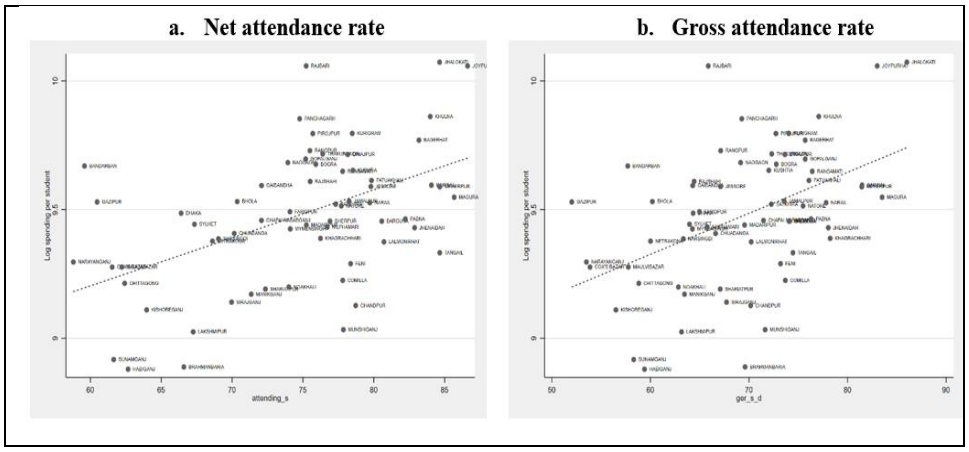
FIGURE 20: **Relationship between Spending per Student and Outcomes for Primary Level**



Source: Authors' calculations using *BOOST* for the fiscal year 2014, *Household Income and Expenditure Survey*, and *Annual Primary School Students Census* (APSC).

Spending per student at the secondary level is correlated with attendance rates, though the relationship losses significance once other factors are considered (Figure 21). Even though the one-to-one correlation between spending per student and attendance is positive and statistically significant, once basic characteristics of the districts and the student-to-teacher ratio are included in the regression, the correlation becomes insignificant (Appendix Table A.6). However, the student-to-teacher ratio remains correlated with net enrollment once we control for other covariates.

FIGURE 21: **Relationship between Spending per Student and Outcomes for Secondary Level**



Source: Authors' calculations using *BOOST* for the fiscal year 2014 and *Household Income and Expenditure Survey*.

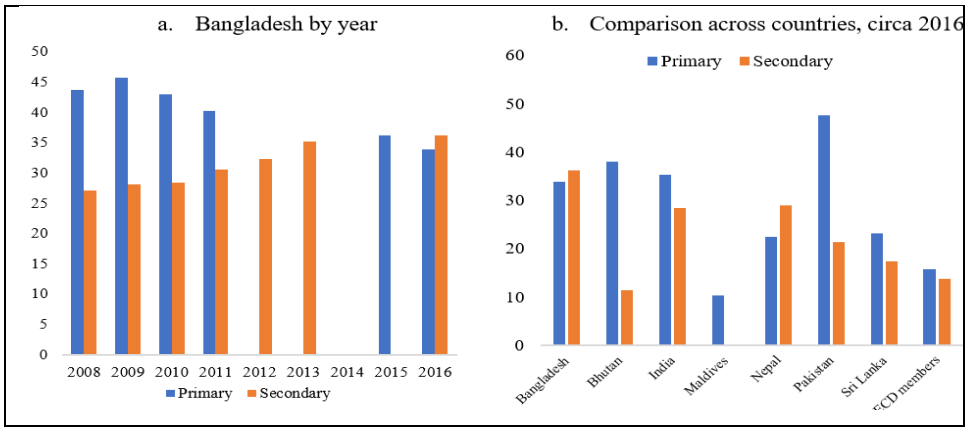
Overall, only when spending translates into lower student-to-teacher ratios do outcomes improve for the primary and secondary levels. This is consistent with previous studies highlighting that higher spending on teachers is a more significant correlate with outcomes for the primary level, and that the effectiveness of other types of spending in improving outcomes is less clear (Steer *et al*. 2014).

Given their importance for education outcomes, more efforts are needed to improve student-to-teacher ratios in Bangladesh. These ratios are high by international standards (Figure 22). In 2016, the average student-to-teacher ratio was 34 in primary and 36 in secondary. For primary, there has been a reduction in this ratio over time; however, for secondary, the ratio has been increasing. Compared to other countries in the region, the primary student-to-teacher ratio is similar to India's, lower than Pakistan's and Bhutan's, but significantly higher than

those of other countries in the region and OECD members. For secondary, Bangladesh's ratio is higher than in other countries in South Asia.

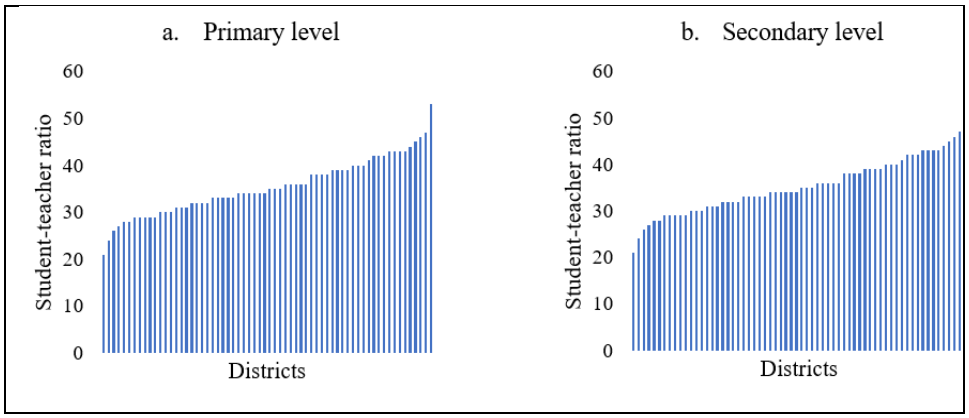
Moreover, at the district level, there is significant variation in student-to-teacher ratios, which can partly explain inequalities in performance across the country (Figure 23). For the primary level, the ratio ranges from 21 students per teacher in Rangamati to 53 in Cox's Bazar (both in Chittagong division). At the secondary level, the ratio ranges from 27 in Thakurgaon and Panchagarh in Rangpur division to in Dhaka to 69 in Habiganj in Sylhet division.

FIGURE 22: **Student-to-Teacher Ratio**



Source: *World Development Indicators*.

FIGURE 23: **Student-to-Teacher Ratios at the District Level**



Source: Authors' calculations using *Household Income and Expenditure Survey 2016* and *BOOST* for the fiscal year 2014.

V. SUMMARY AND POLICY IMPLICATIONS

The results presented here show continued improvement in access to education in Bangladesh. The number of out of school children 6-14 years old fell from about 5.5 million to 3 million between 2010 and 2016, an impressive 45 per cent reduction in six years. The gains in access have recently been accompanied by improvements in the internal efficiency of the education system measured by reductions in drop-out rates and higher survival rates. In addition, the gains have been equitable, reducing disparities by gender, between the poor and non-poor, and across regions. Yet progress is still needed at higher education levels, and there is still an equity agenda, given persistent gaps between the poor and rich and across divisions and districts.

Progress is partly the result of efforts by the Government of Bangladesh (GoB) to improve education outcomes, but it also reflects increased private spending by households. Education spending per student has been growing in the past few years, and its distribution has become more progressive with time. However, GoB education spending is still low compared to other countries in the region, and it presents a large variation across the territory, which is not correlated with education outcomes and internal efficiency indicators. Only when public spending translates into fewer students per teacher do outcomes seem to improve. However, Bangladesh's student-to-teacher ratios remain inadequate compared to other countries and unevenly distributed across districts. Moving forward, this suggests that gearing towards higher-quality spending, in addition to increasing overall budgets, will be a priority to continue improving outcomes.

Stipend programmes help with the progressivity of the system at the primary level. The size of the primary stipend programme represents about 70 per cent of the private spending of households in the poorest quintile, but amounts have been declining in real terms. At the secondary level, there is still significant room to improve the progressivity of these benefits. Improving the targeting of these programmes can also help enhance the impact on outcomes and the progressivity of the education system.

Finally, households' private spending had a central role in the achievements seen in the past two decades. However, many Bangladeshis do not see value in investing in education. Addressing norms and expectations around the benefits of schooling can be an important avenue for further progress. About four in ten secondary school-age children out of school report lack of interest or being too old to go back as their main reasons for not attending school. Work reasons follow (one in four children not attending), particularly for males. Moreover, family

chores and marriage become an important reason for women not to attend secondary school (cited by 30 per cent of women not attending). Similar reasons are found at the tertiary level.

Some policy priorities are suggested by this analysis:

1. *Expanding the levels of GoB spending on education.* The level of public spending on education is low by international standards, and the recent increases in spending per student have been concentrated at the tertiary level. Increasing spending on education can contribute to improving both the quality and quantity of education services.
2. *Improving the quality of GoB education spending by strengthening its link with education outcomes.* Increases in spending alone will not be enough to deliver better education services and outcomes. Currently, education spending per student for primary and secondary presents large variation across the territory, which is not correlated with attendance rates and internal efficiency indicators. Only when spending translates into lower student-to-teacher ratios do results seem to improve. However, Bangladesh's student-to-teacher ratios remain inadequate compared to other countries. This suggests that moving forward, gearing towards higher-quality spending, rather than simply increasing the overall budget, will be a priority for further progress.
3. *Improving the targeting of stipends and tuition waivers.* GoB spending is important to reduce disparities between poorer and richer children. For instance, in 2016, the richest quintile spent about 7.5 times more per student in primary education than the poorest quintile. Once public spending is considered, the gap falls to two times more. Stipend programmes and tuition waivers at the primary level help with the progressivity of the system. The size of the Primary Education Stipend Project (PESP) benefit represents about 70 per cent of the private spending of households in the poorest quintile. However, even though the PESP is more likely to benefit poor children, many of them do not receive this benefit. Moreover, the benefit of the PESP has been fixed since the beginning of the programme, so its importance for households' budgets has been declining in real terms. At the secondary level, there is no relationship between poverty and the receipt of stipends and tuition waivers. Only 20 per cent of stipend recipients belong to the poorest quintile. Given the size of these programmes in a context of low spending, better targeting of benefits can be helpful to enhance the progressivity of GoB spending, particularly at the secondary level.

4. *Enhancing the value placed on education investments by households.* Households' spending was a central element behind the higher investments in children's education and the reduction in disparities seen in the past two decades. However, many households do not find value in education investments. About 51 per cent of households with primary-age children out of school report lack of interest or the children's age as the main reasons for not attending. Similarly, four in ten secondary-age children out of school report lack of interest or being too old to go back as their main reasons for not attending school. Work reasons follow (cited by one in four children not attending), particularly for males. Moreover, family chores and marriage become an important reason for women to not attend secondary school (30 per cent of women not attending). Similar reasons are found at the tertiary level. Thus, beyond supporting households' budgets, addressing norms and expectations around the benefits of schooling can be an important avenue for further progress.

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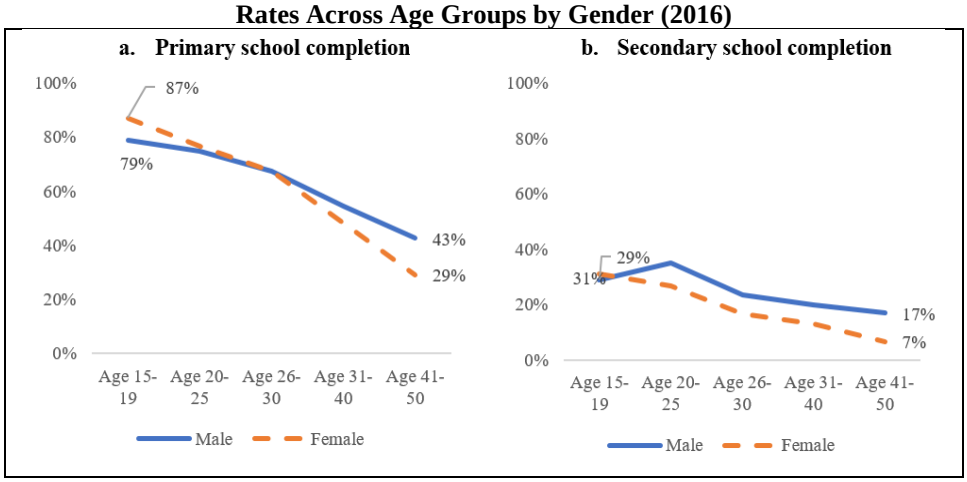
APPENDIX A

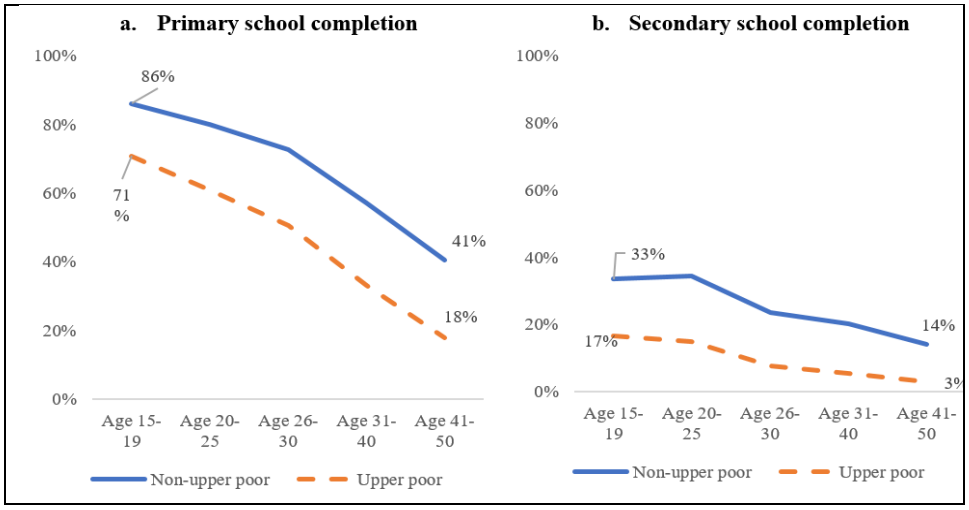
APPENDIX FIGURES AND TABLES

Figure A1. **Primary and Secondary School Completion Rates Across Age Groups by Gender (2016)**



Source: Authors' calculations using *Household Income and Expenditure Survey 2016/17*.
Note: Secondary completion refers to completion of Grade 10.

Figure A2: **Primary and Secondary School Completion Rates Across Age Groups by Poverty Status (2016)**



Source: Authors' calculations using *Household Income and Expenditure Survey 2016/17*.
Note: Secondary completion refers to completion of Grade 10.

Table A.1: **Linear Probability Model for Being Out of School**

	Out of school	Never	Drop out
	(1)	(2)	(3)
Female	-0.036**	-0.026**	-0.011**
	[0.005]	[0.003]	[0.002]
Age	0.012**	-0.003**	0.006**
	[0.001]	[0.001]	[0.000]
Consumption quintile 1 (1)	0.089**	0.062**	0.016**
	[0.008]	[0.006]	[0.005]
Consumption quintile 2	0.059**	0.046**	0.003
	[0.010]	[0.008]	[0.004]
Consumption quintile 3	0.036**	0.023**	0.005
	[0.007]	[0.006]	[0.004]
Consumption quintile 4	0.007	0.004	-0.002
	[0.007]	[0.005]	[0.003]
Female-headed household	0.018	0.013	-0.003
	[0.014]	[0.009]	[0.006]
Household head's education in years	-0.006**	-0.004**	-0.001**
	[0.001]	[0.001]	[0.000]
In urban area	0.053**	0.031**	0.011**
	[0.009]	[0.007]	[0.003]
Both parents present in the household	0.003	0.004	-0.006
	[0.011]	[0.007]	[0.005]
Total number of children 0-17 years	0.003	0.002	0.002
	[0.003]	[0.002]	[0.001]
Constant	-0.051**	0.058**	-0.035**
	[0.016]	[0.012]	[0.008]
Observations	37,211	37,211	37,211
R-squared	0.051	0.032	0.024

Source: Author's calculations using *Household Income and Expenditure Survey 2016/17*.
Note: Regressions include controls for divisions. Standard errors calculated using survey's sampling design.
** p<0.01, * p<0.05, + p<0.1
(1) Omitted is consumption quintile 5.

Table A.2: **Reasons for not Attending School by Group in 2016**

Primary	Do not want to study more	Too old to go back	No money/too expensive	No schools close to home	Have to work	Attending to family chores	For marriage
All	25%	26%	27%	11%	6%	5%	1%
Area							
Rural	20%	30%	26%	13%	5%	6%	1%
Urban	37%	17%	28%	8%	7%	2%	1%
Gender							
Female	23%	27%	31%	10%	3%	5%	1%
Male	26%	26%	23%	12%	8%	5%	0%
Quintile							
1	27%	27%	29%	8%	4%	4%	1%
2	25%	20%	24%	15%	9%	7%	0%
3	22%	23%	38%	10%	2%	4%	1%
4	20%	38%	15%	19%	2%	5%	1%
5	26%	44%	4%	7%	14%	4%	1%

Secondary	Do not want to study more	Too old to go back	No money/too expensive	No schools close to home	Have to work	Attending to family chores	For marriage
All	32%	8%	18%	1%	26%	10%	6%
Area							
Rural	30%	9%	17%	1%	25%	11%	7%
Urban	34%	6%	19%	0%	27%	8%	5%
Gender							
Female	27%	8%	20%	1%	14%	15%	15%
Male	35%	9%	16%	0%	34%	7%	0%
Quintile							
1	28%	10%	22%	1%	23%	11%	6%
2	32%	9%	19%	1%	23%	11%	5%
3	33%	7%	16%	0%	29%	9%	7%
4	31%	6%	14%	0%	30%	10%	8%
5	39%	9%	11%	0%	27%	7%	7%

Tertiary	Do not want to study more	Too old to go back	No money/too expensive	No schools close to home	Have to work	Attending to family chores	For marriage
All	27%	13%	7%	0%	20%	13%	20%
Area							
Rural	25%	14%	6%	0%	20%	13%	22%
Urban	33%	10%	8%	0%	20%	13%	17%
Gender							
Female	25%	13%	5%	1%	6%	18%	32%
Male	30%	12%	9%	0%	41%	7%	2%
Quintile							
1	26%	15%	6%	0%	20%	10%	22%
2	27%	12%	7%	0%	20%	13%	21%
3	24%	14%	8%	0%	20%	15%	19%
4	27%	11%	7%	0%	20%	16%	18%
5	32%	10%	4%	1%	20%	11%	22%

Source: Authors' calculations using *Household Income and Expenditure Survey 2016/17*.

Table A.3: **Median Monthly Expenditures by Type (in takas)**

	All levels					
	Fees	Books	Tutoring	Transport	Others	All
All	123	150	193	0	158	802
Quintiles						
1	21	73	0	0	73	315
2	61	119	112	0	118	548
3	110	146	202	0	157	773
4	191	192	281	0	209	1,127
5	355	258	483	0	311	1,933
	Primary					
	Fees	Books	Tutoring	Transport	Others	All
All	12	58	0	0	83	300
Quintiles						
1	8	35	0	0	46	143
2	9	50	0	0	71	232
3	13	58	25	0	100	328
4	18	71	100	0	125	442
5	60	100	200	0	167	730
	Secondary					
	Fees	Books	Tutoring	Transport	Others	All
All	135	167	250	0	158	843
Quintiles						
1	45	92	50	0	71	363
2	88	129	167	0	108	588
3	125	167	250	0	153	827
4	180	192	350	0	200	1,100
5	275	250	600	0	292	1,817
	Tertiary					
	Fees	Books	Tutoring	Transport	Others	All
All	350	250	167	75	167	1,338
Quintiles						
1	192	158	83	0	58	598
2	249	174	67	0	83	758
3	275	208	125	25	123	1,004
4	358	233	200	83	158	1,363
5	462	300	250	167	300	2,117

Source: Authors' calculations using *Household Income and Expenditure Survey 2016/17*.
Note: In 2016 takas.

Table A.4: **Type of School Attended by Level and Consumption Quintile, 2005-2016**

	Primary											
	2005						**2016**					
Quintile	Government	Private (Govt. subsidized)	Private (Not subsidized)	NGO run institution	Madrasa (Govt. affiliated)	Madrasa (Kowmi)	Government	Private (Govt. subsidized)	Private (Not subsidized)	NGO run institution	Madrasa (Govt. affiliated)	Madrasa (Kowmi)
1	78%	8%	3%	7%	3%	1%	83%	7%	4%	2%	3%	2%
2	82%	8%	3%	3%	3%	1%	81%	6%	6%	2%	3%	3%
3	84%	6%	2%	3%	4%	1%	78%	8%	7%	1%	4%	2%
4	77%	14%	3%	2%	2%	1%	71%	9%	12%	1%	4%	2%
5	63%	23%	13%	1%	0%	0%	61%	14%	18%	1%	3%	2%
	Secondary											
	2005						**2016**					
Quintile	Government	Private (Govt. subsidized)	Private (Not subsidized)	NGO run institution	Madrasa (Govt. affiliated)	Madrasa (Kowmi)	Government	Private (Govt. subsidized)	Private (Not subsidized)	NGO run institution	Madrasa (Govt. affiliated)	Madrasa (Kowmi)
1	30%	55%	1%	1%	12%	2%	24%	66%	3%	1%	5%	1%
2	24%	65%	1%	1%	8%	1%	24%	67%	3%	0%	4%	2%
3	19%	74%	0%	0%	6%	0%	24%	68%	3%	1%	4%	1%
4	18%	76%	1%	0%	5%	0%	23%	69%	3%	0%	4%	1%
5	17%	78%	2%	0%	3%	0%	21%	69%	5%	0%	4%	1%
	Tertiary											
	2005						**2016**					
Quintile	Government	Private (Govt. subsidized)	Private (Not subsidized)	NGO run institution	Madrasa (Govt. affiliated)	Madrasa (Kowmi)	Government	Private (Govt. subsidized)	Private (Not subsidized)	NGO run institution	Madrasa (Govt. affiliated)	Madrasa (Kowmi)
1	100%	0%	0%	0%	0%	0%	35%	60%	1%	0%	3%	1%
2	19%	64%	0%	0%	17%	0%	36%	59%	2%	0%	3%	0%
3	29%	37%	2%	0%	21%	10%	35%	58%	3%	0%	1%	2%
4	38%	57%	0%	0%	5%	0%	35%	60%	2%	0%	2%	1%
5	41%	54%	4%	0%	1%	0%	42%	49%	7%	0%	2%	0%

Source: Authors' calculations using Household Income and Expenditure Survey 2005 and 2016/17.

Table A.5: **OLS Regression between Primary Level Outcomes and Spending Primary level**

District variables	Repetition rate	Survival rate	Efficiency ratio	Dropout rate	Net attendance rate	Gross attendance rate
	(1)	(2)	(3)	(4)	(6)	(7)
Log public education spending per student	-0.77	-5.91+	-1.76	0.58	-2.01	-5.01
	(1.03)	(3.19)	(1.98)	(3.02)	(1.58)	(4.94)
Number of students per teacher	0.02	-0.38*	-0.36**	0.59**	-0.15+	0.06
	(0.05)	(0.14)	(0.10)	(0.20)	(0.08)	(0.17)
Log private education spending per student	-0.55	-1.74	0.61	-0.19	-0.01	4.06**
	(0.56)	(1.46)	(0.71)	(1.36)	(0.66)	(1.40)
Log population	-1.19*	-0.67	1.14	-1.17	0.01	-0.49
	(0.58)	(2.08)	(1.20)	(2.05)	(0.87)	(2.05)
Share of rural population	-0.01	-0.06	-0.04	0.01	0.11*	0.23**
	(0.02)	(0.07)	(0.04)	(0.06)	(0.05)	(0.07)
Poverty rate	-0.01	-0.10+	-0.01	0.08	-0.01	-0.03
	(0.02)	(0.06)	(0.04)	(0.05)	(0.03)	(0.06)
Literacy rate for adults	-0.07*	0.27*	0.20**	-0.19*	0.06	-0.11
	(0.03)	(0.11)	(0.06)	(0.08)	(0.06)	(0.12)
Constant	39.88*	159.52**	77.53*	22.28	104.16**	119.34+
	(16.27)	(53.86)	(33.53)	(55.32)	(25.40)	(68.15)
Observations	64	64	64	64	64	64
R-squared	0.17	0.35	0.47	0.42	0.20	0.21

Note: Robust standard errors are in parentheses.
** p<0.01, * p<0.05, + p<0.1.

Appendix B

Human Opportunity Index

The previous sections showed substantial gains in education outcomes and that those gains have been broad-based, reducing disparities across regions and groups. This section explores the relative importance of the expansion in education access and the distribution of that access across children using the *Human Opportunity Index* (HOI).[13] The HOI, presented in Figure B.1, measures how characteristics such as the area of residence or the gender of a child may affect his/her access to education. For the analysis, we focus on two outcomes: primary and secondary school attendance. The HOI presents an adjusted measure of attendance rates that extracts a penalty for any inequity in attendance observed among children living under various circumstances outside their control.

Consistent with the expansions in school attendance presented above, the HOI has increased between 2000 and 2016 for both primary and secondary levels. For primary, the HOI grew from 68 to 91 per cent, driven both by a rise in coverage and also a reduction in the inequality of that coverage across children (seen by the shrinking difference between the HOI and the attendance rate). For secondary level, the HOI rose from 40 to 66 per cent.

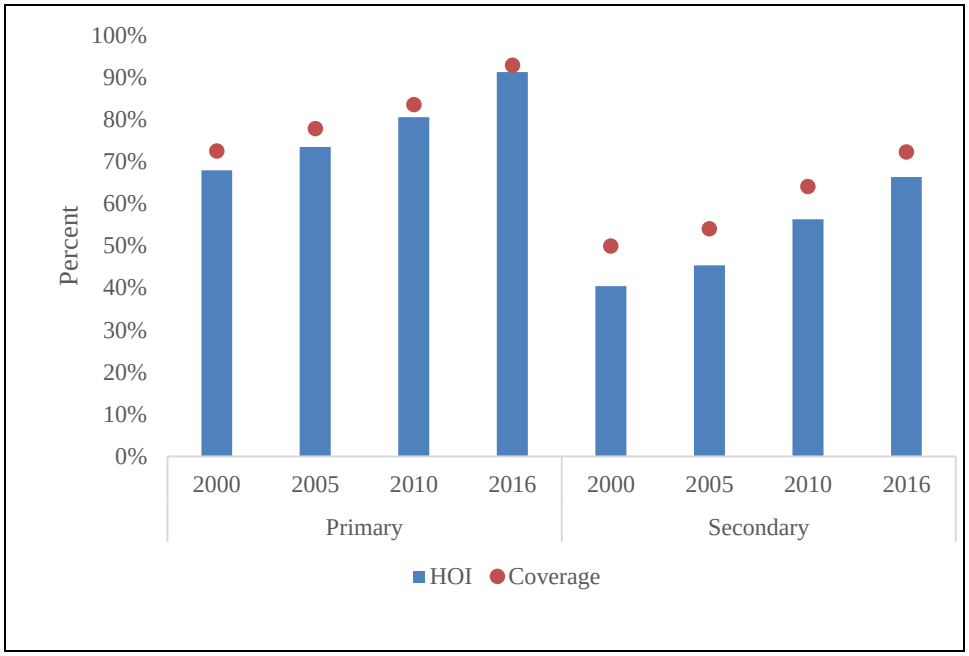
Overall, the increase in the HOI was mainly driven by expansions in attendance rates, but reduction in disparities also played a role (Figure B.2). For primary level, a decomposition of the changes in the HOI across time shows that the expansion in attendance rates explains about 72 per cent of the change in the HOI between 2000 and 2016, and 84 per cent of the change between 2010 and

[13] The *Human Opportunity Index* (HOI) measures how individual circumstances (i.e., characteristics such as place of residence, gender, and education of the household head) can affect a child's access to basic opportunities, such as education, electricity, or water and sanitation. It is a synthetic measure of how far a society is from universal access to an essential good or service, and how equitably access is distributed across distinct groups of individuals (circumstances). The HOI is thus an economic indicator that combines coverage rates and equality in a single measure. The HOI is based on discounting a penalty for inequality of opportunity P from the overall coverage rate C so that: HOI=C-P. The penalty is chosen such that it is zero if all circumstance group specific coverage rates are equal, and it is positive and increasing as differences in coverage among circumstance groups increase. For more information about the HOI, see Barros *et al*. (2009) and Barros, Molinas Vega, and Saavedra (2010).

2016. For secondary, the rise in attendance explains 76 per cent of the change since 2000, and 75 per cent of the change since 2010.

The HOI analysis also highlights that household resources and adults' education are the main circumstances behind disparities in children's school attendance (see Figure B.3). For primary school in 2016, the level of consumption of the household explains 38 per cent of the differences in attendance, and the years of education of the household head explain 31 per cent of the disparities. For the secondary level, these two factors contribute to 73 per cent of the disparities in attendance rates. The next circumstance is the gender of the child, explaining 14 per cent of the disparities in secondary attendance.

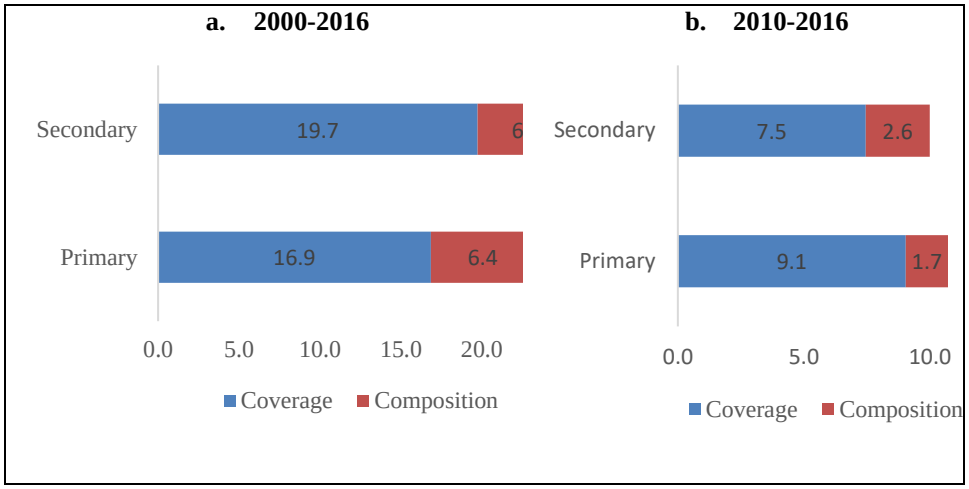
Figure B.1. **Human Opportunity Index for Attendance Rates, 2000-2016**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2000, 2005, 2010, and 2016.

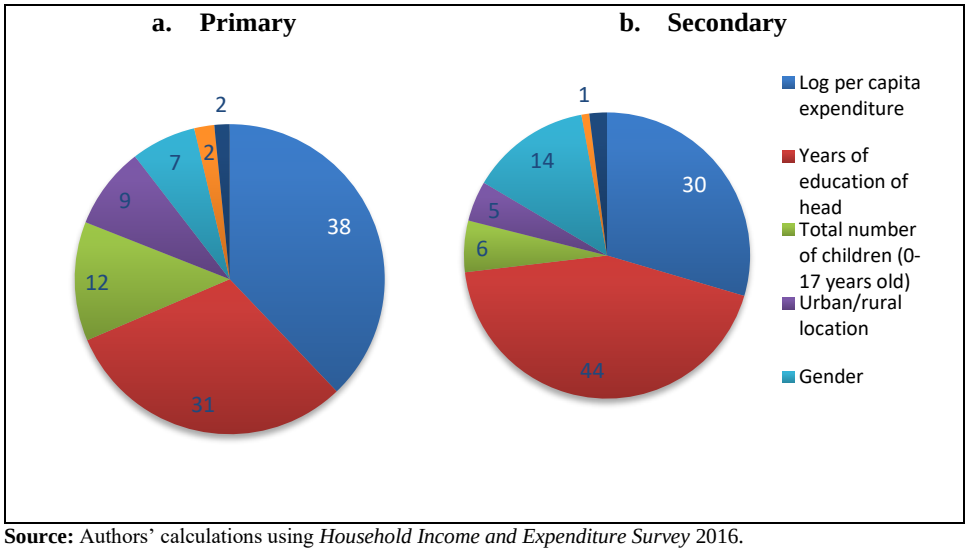
Note: Primary school attendance for children 6-10. Secondary school attendance for children 11-15.

Figure B.2: **Decomposition of the Change in the HOI**



Source: Authors' calculations using *HIES 2000, 2010 and* 2016.

Figure B.3: **Circumstances that Explain Disparities in Attendance Rates, 2016**



Source: Authors' calculations using *Household Income and Expenditure Survey* 2016.
Note: Primary school attendance for children 6-10. Secondary school attendance for children 11-15.