

# **Roll Call**

## **Teacher Absence in Bangladesh**

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*Note: This study does not necessarily represent the views of The World Bank, Harvard University, or The Department of International Development (DFID), Government of United Kingdom.*

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## **Executive Summary**

Absence of public servants from their jobs has been long discussed as an impediment to effective public service delivery. The policy dialogue on this issue has, however, been hampered by the lack of rigorous empirical studies on provider absence. We draw upon an unique survey in which we made *unannounced visits* to a sample of government run primary schools and government-aided but privately run secondary schools in Bangladesh, with the intention of:

- Documenting the extent of teacher absence
- Understand the patterns and correlates of teacher absence (including individual characteristics, facility, and community characteristics; institutional settings and practices)

## ***Levels and Patterns of Teacher Absence***

- The average teacher absence rate in primary school is 15.5%
- The absence rate in primary schools is highest among headmasters - one out of every five headmaster was absent during the time of the survey
- Cross-sectional averages mask the extent of this problem -we find that 23.5% of primary school teachers were absent during at least one of the two visits

Our cross-section survey on secondary schools reveal teacher attendance problems which are as prevalent, if not more so compared to primary schools.

- The average secondary school teacher absence rate is 17.6%, with assistant teachers (19.3%) and headmaster (17.8%) having the highest absence rates
- The teacher absence rate in secondary schools increases with remoteness of the school: 10.8% in major metropolitan areas, 13.5% in small towns, 19% in rural areas

## ***Reasons Given for Teacher Absence***

- The predominant reason given for why the teacher was not in school during the day of the visit was that the teacher was away performing official duties

We did not check into the veracity of the reasons given for the absence, however, in the South Asian context one often hears about the fact that government teachers are pulled away from classrooms for a variety of non-teaching related activities.

## ***Correlates of Teacher Absence***

### **Monitoring and Sanctions**

Teachers are 10% more likely to be absent in secondary schools which have never been visited by education officials, highlighting the importance of formal supervision. There might potentially even be a stronger informal supervision effect emanating from the community. Secondary school teachers are 68% less likely to be absent in schools attended by pupils with better educated mothers. Education level of the community is certainly related to the income level of the community, but it also reflects the level of community empowerment and interest of parents in the quality of their child's schooling, hence, a potential proxy for direct monitoring of teachers by the parents.

### **Opportunity Costs**

More "powerful" teachers will be able to protect themselves from the possibility of sanctions, explicit or otherwise, that could be brought to bear on them. We do find that headmasters in both primary and secondary schools are absent much more often than other teachers. Head teachers are the most

powerful staff in the schools that they work. This could be an indication of their relative power but could be measuring a number of other characteristics related with outside income earning opportunities and administrative responsibilities.

Teachers who engage in private tutoring as a side occupation are less likely to be absent. This might reflect the fact that teachers might be using class time to recruit clients for their private sessions.

### **Internal Motivation/ Commitment to the Community**

Having been specifically trained in education (both pre-service training certification and in-service training) leads to better attendance among both primary and secondary school teachers, perhaps reflecting a sense of professional ethos instilled during training. Having been at one's current job for a long time also decreases absence (which may reflect a cultivated sense of being an important part of the community). However, being recruited from the local area has no effect on teacher absence.

### ***Association between Teacher Absence and Pupil Performance***

We use the extent of teacher absence as a proxy for school quality to look at the association between teacher absence and school examination pass rates; and a basic mathematics and language test that we administered to a subset of 5<sup>th</sup> and 10<sup>th</sup> grade students.

- We do not find any significant correlation between teacher absence and Secondary School Completion (SSC) examination pass rates. This does not surprise us given that the SSC exam pass rate has been remarkably stable over a long period of time, reflecting deep structural factors which we cannot control for.
- We do find that teacher absence has a significant adverse effect on English language test scores in primary schools. While we also find a negative effect of teacher absence on secondary school test scores, the effect is not significant.

### ***Policy Implications: Tackling Provider Absence in Education***

#### **Increasing the frequency of inspections might help to lower teacher absence in secondary schools.**

Currently, while public funding to private-run secondary schools is supposed to be tied to school performance, in practice there are few institutional mechanisms to ensure accountability. Our analysis underscores the fact that greater monitoring of secondary schools must be a top priority of education officials.

#### **Policymakers should re-evaluate tools which are commonly touted as enhancing accountability.**

Low salaries are always blamed for causing high provider absenteeism. We, however, find that teachers with higher salaries are more likely to be absent. Salaries already account for 97% of the overall recurrent expenditures in education – it is unlikely that the Government of Bangladesh will be able to increase that share even further. Even if new funding becomes available, education officials should first fix this institutional problems, particularly in primary schools, which takes 20% of its headmasters away from the school on any given day.

Private service delivery does not automatically lead to better accountability. In our sample we find that private run secondary schools have comparable, if not higher rates of teacher absence compared with government primary schools. It is not about public vs. private, rather it is about strengthening the institutional capacity to hold providers accountable.

## **Addressing teacher absence will require experimentation with new approaches in institutional delivery of basic services.**

Further, proper and rigorous evaluation must accompany such experiments to ensure that policymakers can identify unambiguous causal factors which help to lower provider absence. For example, while we can say that there is a strong association between lack of supervision and high teacher absence in secondary schools, we cannot make a causal argument that better supervision will lead to lower absence, without a thorough evaluation of a specific policy intervention.

### **1. Introduction**

The Millennium Development Goals (MDGs) represent an unprecedented international commitment for major improvements in human development outcomes, for example, universal primary education completion by 2015. The delivery of publicly supplied schooling, however, is plagued by a plethora of problems affecting the quantity and quality of services (World Development Report 2004: *Making Services Work for Poor People*, World Bank 2004). While we acknowledge that deficiencies in schooling outcomes are influenced by a complex array of determinants (child, household and community factors, access, school quality, linkages across sectors<sup>1</sup>) – this study limits its focus to examining one specific institutional deficiency, that of teacher absence. If the teacher is absent either for ‘valid’ reasons (e.g., pulled away from classroom for non-teaching duties) or for ‘dubious’ reasons (absenteeism), *and* there is no substitute teacher available, it must go without saying that the quality of teaching will suffer.

Absence of public servants from their jobs has been long discussed as an impediment to effective public service delivery, particularly in South Asia. In certain districts of India, a recent report on primary education pointed to absentee rates among head-teachers of 33%<sup>2</sup>, and among all teachers rates so large that actual teaching was being done in less than half the schools visited (PROBE Team 1999). That report goes further and reports on gross misbehavior of teachers that do show up for work but pinpoints absenteeism per se as a major problem. A survey of primary schools in the states of Uttar Pradesh and Madhya Pradesh found that 17 % of teachers were absent from school (Rao 1999; World Bank 2001). Similarly, a survey of primary schools in West Bengal found that 20% of the teachers were absent (Sen 2002). In a large sample of public and private schools in the North West Frontier Province of Pakistan, the rate of teacher absence averaged 18 percent (Ali and Reed 1994; King et al. 1999). Another survey of primary schools in Pakistan found that 10% of the teachers were absent (Reimers 1993).

By no means is teacher absenteeism a purely South Asian phenomenon. For example, Glewwe et al. (1999) found that 28.4% of teachers were absent in one area of Kenya. Nor is teacher absence solely a developing country phenomenon (Ehrenbertg et al. 1991; Pitkoff 1993). A recent survey of studies on teacher absence concludes that while teacher absenteeism is indeed a significant problem in developed country school systems, there are few robust findings on its causes (Norton 1998). This underscores the fact that even in developed countries with a wealth of data on schools and personnel, understanding the causes of teacher absence is a difficult exercise. The problem of teacher absence in developed countries is, however, ameliorated due to the existence of a system of substitute teachers who can replace absent teachers – a luxury that few poor countries can afford.

Most of the surveys/studies mentioned above, however, are not nationally representative nor easily comparable given varying methodologies. Before the project that produced the data used in this study, there were very few nationally representative surveys of teacher absence; these included most notably a survey that found a teacher absence rate of 15 % in primary schools in Papua New Guinea (World Bank 2004), and another that found a rate of 17 % for Zambian primary schools (Habyarimana et al. 2003). To begin to fill these gaps in our understanding of the extent and causes of provider absence,

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<sup>1</sup> Particularly the relationship between health and education (Behrman 1996; Miguel and Kremer 2002).

<sup>2</sup> PROBE team (1999)

researchers from the World Bank and Harvard University<sup>3</sup>, in collaboration with the Global Development Network, initiated in 2002 a multi-country survey of service delivery facilities in basic health and education (Chaudhury et al. 2004). This project encompassed seven countries—Peru, Bangladesh, Ecuador, Ethiopia, India, Indonesia, and Uganda. The objective was to gather data on absence using a common (and hence cross-nationally comparable) facility survey instrument in a representative national sample of education and health facilities in each country (for more details on the multi-country study, see Chaudhury et al. 2004.)

This particular study represents the first systematic examination of the issue of teacher absence in Bangladesh. The objectives of this study are to:

- (a) Document and characterize the extent of teacher absence in primary and secondary schools
- (b) Understand the patterns and correlates of teacher absence
- (c) Examine the association between teacher absence and scholastic outcomes

The rest of the paper is structured as follows. In Section 2 we highlight some pertinent institutional characteristics of service delivery of primary and secondary schooling. In Section 3 we discuss the survey methodology and dataset. In Section 4 we present some descriptive statistics on absence rates, reasons given for absences, and discuss certain key teacher, school and pupil characteristics. In Section 5 we lay out the conceptual framework, the econometric specifications, and discuss multivariate regression results regarding the correlates of teacher absence. In Section 6 we explore the association between teacher absence and test scores. Finally, in Section 7 we conclude by summarizing our findings and discuss policy implications.

## **2. Institutional Setting of Primary and Secondary Schooling in Bangladesh**

The Government of Bangladesh uses two different institutional models to deliver primary and secondary schooling. Most primary school pupils are educated in a system which is both publicly financed and publicly delivered. On the other hand, while there is considerable public financing of secondary schooling, most secondary schools are operated by the private sector.

### ***Primary Schooling***

Primary education in Bangladesh officially begins at age six and is five years in length (grades 1-5)<sup>4</sup>. There are more than 76,000 primary schools in the country, and these schools are grouped into several categories (Table 1). Currently while only 49 percent of the primary schools are in the government sector, over two-thirds of the primary school students are enrolled in government schools<sup>5</sup>. The primary school system falls under the Ministry for Primary and Mass Education (MOPME). Within the MOPME, the Department of Primary Education (DPE) is responsible for the management and supervision of public primary schools. The DPE has offices located in both the district and sub-district level throughout the country<sup>6</sup>, and they are responsible for the management and supervision of formal primary education. The Directorate employs more than 175,000 teachers and oversees more than 37,000 government primary schools<sup>7</sup>. The government finances education expenditures mainly through revenue and development allocations in the national budget<sup>8</sup>. Salaries of primary school teachers

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<sup>3</sup> With primary funding from DFID

<sup>4</sup> Bangladesh has made tremendous progress since its independence in expanding access to primary schooling. Net enrollment rate has reached over 90 percent, with over 70 percent completion rate.

<sup>5</sup> Others schools are managed by non-governmental organizations, community organizations, or Islamic groups.

<sup>6</sup> Bangladesh is administratively divided into divisions, districts and sub-districts.

<sup>7</sup> In addition, the DPE provides technical and financial support to over 19,000 NGO and 7,000 Madrasah schools.

<sup>8</sup> Local communities often provide space in rented or donated buildings; land for school construction.

account for 97 percent of the total recurrent education expenditures – making it *the* supply-side input in the production of primary schooling.

**Table 1. Distribution of Primary Schools (2000)**

Category of Institutions	Number of Institutions
Government	37,677
Non-government registered	19,253
Madrasha (Islamic School)	7,147
Satellite school	3,739
Community school	3,061
Kindergarten	2,296
Non-government unregistered	2,126
Attached to High schools	1,220
Others	145
Total	76,664

*Source:* DPE. 2001. Primary education statistics in Bangladesh.

### **Secondary Schooling**

In Bangladesh, secondary education is divided into two levels. Secondary schools teach grades 6 - 10, and colleges provide higher secondary or intermediate level education for grades 10 - 12. The secondary schools are further subdivided into two sub-levels: lower secondary (5 – 8) and secondary (9 – 10) grades. The lower secondary level schools are known as junior high schools and are located in rural areas. Approximately 90 percent of secondary schools are operated by the private sector (Table 2). Furthermore, approximately 85 percent of secondary-level students are enrolled in non-government schools. The Directorate of Secondary and Higher Education (DSHE) is responsible for management and supervision of secondary schools, under the aegis of a separate ministry, the Ministry of Education (MOE). DHSE divides its operations into eight zones, with each zone headed by the Deputy Director, who in turn is assisted by two to four Inspectors. The District Education Officer (DEO) heads the district level offices, however, there are no permanent government staff posted at the sub-district level to monitor secondary schools.

**Table 2. Distribution of Secondary Level Institutions (1997)**

Category of Institutions	Number of Institutions
Junior Secondary	3,002
Private Secondary Schools	10,459
Government Secondary	317
Attached to College (non-government)	1,669
Madrasah (Islamic School)	4,795
Total	20,242

*Source:* Bangladesh Education Statistics 1997.

Secondary non-government schools are legally not-for-profit institutions run under the supervision of a school management committee (SMC). These schools benefit from public financing both indirectly and directly. The Female Secondary School Stipend Project (FSSAP) provides stipends and tuition waivers to females residing in non-municipal areas attending grades 6 - 10 (with close to four million females receiving stipends annually). This demand-side subsidy program has been considered to be immensely successful in attracting females to secondary schools (which is reflected by the fact that 55 percent of secondary school pupils are females)<sup>9</sup>. Once the secondary school manages to attract a

<sup>9</sup> Currently only 40 percent of eligible adolescents are enrolled in secondary schools.

critical threshold of students, it then becomes eligible to receive direct public subsidies. Registered non-government secondary schools receive over 80 percent of their recurrent expenses (e.g., teacher salary, rent, medical allowances) from the government. The government also makes grants to non-government secondary schools for certain capital expenditures (e.g., repair of school buildings). The remaining portion of the school's total expenditures are financed from private sources (e.g., tuition and other fees). To ensure that schools have an incentive to maintain quality, the government payments are supposed to be linked to performance criteria. Financing is supposed to stop if schools do not meet minimum performance criteria for a period of five years. In practice, once schools attain eligibility to receive financing, subsidies flow regardless of performance (World Bank 2003).

### **3. Survey Methodology**

#### ***Sampling***

For administrative purposes, Bangladesh is divided into six divisions, 64 districts (*Zilas*), and 507 sub-districts (*Upazilas*). Probability proportion to population size (pps) sampling was used to select 100 public primary and 100 government-aided private secondary schools for the study. First, all of the Upazilas in the country were divided into three groups: rural, municipality, and metropolitan. Fifty upazilas were picked based upon pps. In each selected Upazila, a complete list of primary and secondary schools were prepared by visiting both district and Upazila Education Offices. Then ultimately two primary and two secondary schools were randomly selected from each Upazila. All the selected primary schools were revisited; secondary schools were visited only once<sup>10</sup>.

#### ***Timing of Visits***

All school surveys were carried out in 2003. There was no notification of visit given before the survey team arrived at any school. Round one of the primary schools survey was completed within March – May; round two within June – July. The secondary school survey was carried out between May – July. All schools were visited during official hours of operation. Schools were visited during days when they were officially supposed to be in session (care was taken not to visit during major examination periods). In some occasions, however, schools were found to be closed due to various reasons – such cases were not counted as ‘visits’ given that no information was recorded. During the first primary school survey round, 6 schools had to be revisited (3 schools were closed due to a local holiday; 1 school was closed due to heavy rains; 1 school was closed to throw a farewell party for the headmaster; and 1 school was closed due to the fact that all the teachers were away for training). During the second primary school survey round, 8 schools were revisited, mostly due to adverse weather conditions (6 schools were closed due to flooding<sup>11</sup>; 2 schools were closed due to teacher training). Seven secondary schools had to be revisited due to various reasons (2 schools were closed due to flooding; 2 schools were holding examinations; 2 schools were being visited by officials; and 1 school was closed due to farewell party for headmaster).

#### ***Survey Instruments***

Each sampled primary school was visited twice by a team of trained enumerators. During the first visit, the enumerators collected teacher (e.g., demographic data, location of residence, level of education, duration of posting) and school specific information (e.g., availability of latrines, distance to paved road, last time the school was visited by the DOE). For teachers who were absent both times, enumerators had to rely upon information provided by other teachers and administrators. During the second visit enumerators also collected child level information and administered a basic literacy and math exam to a subset of 5<sup>th</sup> grade students. In each primary school, ten 5<sup>th</sup> grade students were

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<sup>10</sup> Due to budgetary limitations.

<sup>11</sup> One school could not be surveyed even at the third attempt given inclement weather conditions. Hence, there are only 99 primary schools in the panel.



randomly picked from the student roster. Each sampled secondary school was visited only once by the same team of trained enumerators. Enumerators collected teacher, school, and pupil specific information (a basic literacy and math exam was also administered to ten randomly picked students from the 10<sup>th</sup> grade roster in all secondary schools). For teachers who were absent we again had to rely upon information provided by other teachers and administrators. Besides the facility survey, we also conducted a limited ‘institutional’ survey filled out by policymakers at the various education ministries and district education offices. Our primary focus was on collecting information governing the recruitment, posting, transfer, and supervision of teachers.

## 4. Descriptive Findings

### *Absence Rates*

For the purposes of this study, “absence” has a very specific definition. Upon arriving at the school, enumerators met with the headmaster, or teacher in charge if the headmaster was absent, to draw up a roster of teachers currently employed at the school. First the primary respondent was asked to go through the roster and indicate whether the teacher was present or not. If the primary respondent indicated that a teacher was absent, the primary respondent was further asked as to why the teacher was absent that day. After the interview with the primary respondent was completed, the enumerators began interviewing teachers on the roster. The definition of absence that we use throughout this study is based upon physical verification by the enumerators, i.e., a teacher is referred to as absent *only if* the enumerator could not physically find the teacher, *and* the teacher was away due to reasons given other than suspension, deputation (‘temporary’ reassignment), or working on a different shift (teachers belonging to these three categories were completely removed before conducting any analysis, i.e., they neither count as being present or absent).

We present the basic results concerning primary school teacher absence in Table 3. The teaching staff in primary schools consists of three types of teachers - headmasters, assistant headmasters, and (regular) teachers. Given the extremely small proportion of assistant headmasters in most primary schools, we lumped assistant teachers with teachers. Out of 413 teachers (all types) in our sample, 12 teachers were on suspension, deputation, or worked in a different shift. Thus, our effective sample of primary school teachers was 401. Out of the 401 teachers, the absence rate (averaged over two rounds) is 15.3%. Headmasters had the highest absence rate - one out of every five headmaster was found to be absent. Absence rates are highest in schools located in major metropolitan areas (17.5%).

Comparing with other countries in the global project and those for which we have comparable surveys (see Table 3.1), Bangladesh ties with PNG for the third-lowest absence rate in our sample. The absence rate is low compared to the only other (richer) South Asian country in our sample, India (25% - average over 14 states)<sup>12</sup>. The Bangladesh primary schooling system, however, has one of the lowest teacher-to-pupil contact time and one of the highest pupil-to-teacher ratio in the developing world (ADB 2001). While an average (across two visits) absence rate of 15% does not seem too high, it is important to note the 23.5% of teachers were absent during at least one of the two visits<sup>13</sup> (we can compute this figure given that we track the same schools and teachers across the two survey rounds). This implies that the effective pupil-to-teacher ratio is actually higher given that almost one out of every four teacher is potentially absent.

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<sup>12</sup> The teacher absence rate in Bangladesh is also low compared to bordering Indian states covered within our India sample: West-Bengal (23%) and Assam (34%).

<sup>13</sup> Only 3.2% of teachers were absent during both survey rounds

<p><b>Table 3.1</b></p> <p><b>Primary-school teacher absence, 2002-03</b></p>	
	Absence rate (%)
Bangladesh	15
Ecuador	14
India	25
Indonesia	19
Peru	11
Papua New Guinea	15
Uganda	27
Zambia	17
<p><i>Sources: Chaudbury, Hammer, Kremer, Muralidharan, and Rogers 2004 for most countries; NRI and World Bank 2003 for Papua New Guinea; Habyarimana, Das, Dercon, and Krishnan 2003 for Zambia</i></p> <p><i>Note: Absent staff are fulltime teachers on current shift who were not found anywhere in the school at the time of an unannounced visit (see text for details).</i></p>	

We present the basic results concerning secondary school teacher absence in Table 4. The teaching staff consists of four types of teachers - headmasters, assistant headmasters, teachers, and assistant teachers. Out of 959 effective teachers in our sample, the absence rate is 17.6%. Assistant teachers and Headmasters had the highest absence rate (19.3% and 17.8%, respectively). While there appears to be no relationship between income-level of the division and teacher absence rate, within divisions, absence rates increase as you move out from major towns (10.8%), to peri-urban (13.5%), to rural areas (19%). This is an interesting finding given that parallel labor market opportunities and higher income earning potentials germane for teachers decrease as you move from the center to the periphery. Rural secondary schools, however, are less likely to be supervised by education officials, and hence, teachers would be more likely to shirk. Also, as we mentioned earlier, there are no secondary school supervisors below the district level.

Unlike primary schools, in secondary schools female teachers are more likely to be absent (21%) relative to their male colleagues (17.1%). While in this section we hold off in drawing upon any conceptual framework to discuss these descriptive statistics, we would like to note that the (overall average) absence rates for primary and secondary schools teachers are quite similar. By no means does private provision automatically guarantee better accountability.

**Table 4. School Absence Statistics, Primary and Secondary**

<b>Primary Schools</b>	
'Number of Schools in the Sample <sup>14</sup> :	99 (each visited twice)
Number of Teachers in the Sample:	401 (802 observations in the panel)
% Teachers Absent <sup>15</sup> (average):	15.3
% Teachers Absent – Round 1:	16.1
% Teachers Absent – Round 2:	14.5
% Teachers Never Absent:	73.4
% Teachers Absent Once:	23.5
% Teachers Absent Twice:	3.2
<b>% Teacher Absent</b>	
Male	15.3
Female	15.3
Head Master	20.2
Teacher	14.9
Rural	15.7
Municipality	12.7
Metropolitan	17.5
Barisal	10.3
Chittagong	14.3
Dhaka	15.5
Khulna	15.4
Rajshahi	14.3
Sylhet	18.5
<b>Secondary Schools</b>	
Number of Schools in the Sample:	100
Number of Teachers in the Sample:	959
% Teachers Absent <sup>16</sup> :	17.6
<b>% Teacher Absent</b>	
Male	17.1
Female	21.0
Head Master	17.8
Assistant Head Master	11.3
Teacher	15.2
Assistant Teacher	19.3
Rural	19.0
Municipality	13.5
Metropolitan	10.8
Barisal	15.3
Chittagong	13.8
Dhaka	19.6
Khulna	13.0
Rajshahi	21.3
Sylhet	19.0

<sup>14</sup> One school had to be dropped due to data inconsistencies.

<sup>15</sup> Provider is defined as absent if enumerator could not locate the provider during time of interview.

<sup>16</sup> Provider is defined as absent if enumerator could not locate the provider during time of interview.

## ***Reasons Given for Absence***

The various reasons given for teacher absence are presented in Table 5. During the pilot survey we did attempt to look at leave records and other evidence to corroborate reasons given for absence. Usually such probing was considered too intrusive by the respondent and considerably slowed down the survey. We decided not to probe further into this issue during the actual survey. Thus, it is important to bear in mind that we cannot make any judgment regarding the veracity of the reason given as to why the teacher was absent from school that given day.

While only less than 2% of the primary school teacher absences were unaccounted for (i.e., no excuse could be given whatsoever), 20% of the absences of secondary school teachers could not be accounted for at all. The two predominant reasons given for primary school teacher absence was “away on official school related duties” (49%), and “on official-leave” (33%). In secondary schools, 39% of the absences were supposedly due to teachers having to perform official duties away from the school, and 22% of the absences were supposedly due to personal leave. In the South Asian context, one often hears about public school teachers who are pulled away from classrooms to partake in all sorts of government duties ranging from helping to conduct population census to immunization campaigns, to assisting local politicians in various capacities<sup>17</sup>. Regarding the issue of being away “on official-leave”, even if these teachers are genuine on leave, it is surprising that so many teachers would be on leave while school was in session.

## ***Basic Teacher, School, and Pupil Statistics***

Teacher, school (infrastructure, supervision), and pupil characteristics are presented in appendix Table A1. The only significant demographic difference between primary and secondary school teachers appear to be that primary school teachers are more likely to be female. It is not surprising that given the difference in basic education requirements between primary and secondary schools, secondary schools are more likely to have teachers who are college graduates. Secondary schools also tend to be newer facilities with better infrastructure. Given as we previously mentioned that there is no provision for sub-district secondary school inspections, it does not come as a surprise that 15% of secondary schools have never had an inspection visit, compared to less than 1% of primary schools who have never been inspected.

We are encouraged by the fact that some of our sample averages are consistent with national statistics. While provision of public primary schooling in Bangladesh is quite progressive, most of the benefits of publicly-aided secondary schooling are captured by the rich<sup>18</sup>. In our sample we find that pupils attending secondary schools come from families with better educated parents who own more assets, relative to pupils coming from primary schools. Despite the fact that potentially all females are eligible to receive the secondary school stipend, it appears that the ‘costs’<sup>19</sup> of sending a child to secondary school still deters poor households from doing so. While we do not present gender-differentiated averages on parental background, we find that in secondary schools female pupils are more likely to come from households with high value assets (e.g., TV), relative to male students. Again, this is a possible indication that the subsidy is being captured by females from non-poor households. Putting aside the benefit-incidence dimension, the secondary school stipend program has boosted female enrollment which is reflected by the fact that 55% of secondary school pupils in Bangladesh are females - which mirrors the proportion in our secondary school sample. Another example of the

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<sup>17</sup> Government-aided secondary schools by law have to allow the local member of parliament to sit on the school management committee. Often one hears about local politicians who exert their influence over the SMC for their own personal agendas.

<sup>18</sup> While the poor account for 56% of the primary education expenditure, the rich capture 76% of the secondary school expenditure (*Bangladesh Public Expenditure Review*, World Bank 2003).

<sup>19</sup> Besides loss of potential wage income, for females there are other issues such as domestic work, social norms, and concerns about safety, that hinder their parents from sending them to school.

representativeness of our sample is that our average secondary school leaving examination pass rate (39.5%) lines up with the national average (40%).

**Table 5. Primary and Secondary Schools: Reasons for Absence (%)**

*Overall (All-types of Teachers)*

	<b>Primary</b>	<b>Secondary</b>
Official teaching related duty	49.0	39.1
Official non-teaching related duty	4.5	0
Sick	9.5	9.5
Authorized leave	32.8	21.9
Left early	0.7	2.4
Arrive later	1.5	0
Off due to examinations	0	7.1
Unauthorized absence	1.5	20.1

*Head Master*

	<b>Primary</b>	<b>Secondary</b>
Official teaching related duty	68.6	75.0
Official non-teaching related duty	0	0
Sick	0	6.3
Authorized leave	22.9	6.2
Left early	2.8	6.2
Arrive later	2.8	0
Off due to examinations	0	0
Unauthorized absence	2.9	6.3

*Assistant Head Master*

	<b>Primary</b>	<b>Secondary</b>
Official teaching related duty		57.1
Official non-teaching related duty		0
Sick		0
Authorized leave		42.9
Left early		0
Arrive later		0
Off due to examinations		0
Unauthorized absence		0

*Teacher*

	<b>Primary</b>	<b>Secondary</b>
Official teaching related duty	41.2	43.8
Official non-teaching related duty	5.9	0
Sick	12.8	3.1
Authorized leave	35.3	31.3
Left early	1.0	0
Arrive later	1.0	0
Off due to examinations	0	0
Unauthorized absence	2.9	21.9

*Assistant Teacher*

	<b>Primary</b>	<b>Secondary</b>
Official teaching related duty		32.1
Official non-teaching related duty		0
Sick		12.5
Authorized leave		20.5
Left early		2.7
Arrive later		0
Off due to examinations		10.7
Unauthorized absence		21.4

## 5. Empirical Model of Teacher Absence and Regression Results

It is extremely difficult to model the behavior of primary school teachers given that there is considerable theoretical ambiguity (complex political-economy processes, nested principle-agent problems) on how to model the behavior of public sector employees which yield reduced-form solutions with testable empirical hypothesis (Dixit 1997). In principle at least, we should be able to model the behavior of secondary school teachers given that modeling the private provision of schooling should be no different than modeling the private provision of samosas<sup>20</sup>. However, these are not purely private providers given that they employees of ‘not-for-profit’ entities which operate under substantial public subsidies and various political-economy considerations.

We know from derived demand theory that goods are valued along both quantity and quality attributes (Lancaster 1966). As long as parents view teacher absence as a negative attribute, are able to bear the cost of switching schools, and there is no rationing of good quality schools, parents can ‘shop’ around till they find a school with lower absence rate. If enough parents voice their concerns and exit out of dysfunctional schools (a la Hirshman 1972), over time we would expect overall schooling quality to improve. While we do not have systematic qualitative data on perceptions about teacher absence in Bangladesh, perception surveys about provider absence (both teachers and medical providers) from various countries (cite Gallup poll, Savadoff, ECA report) indicate that citizens are indeed concerned about this problem<sup>21</sup>. We have no reason to believe that Bangladeshi parents do not care whether their child’s teacher shows up to school or not. We, however, do not know whether parents tolerate certain thresholds of inefficiencies due to historical or cultural path-dependent factors which anesthetizes them from reacting against the status-quo. If average Bangladeshi citizens are unable to hold the public sector accountable for over 40% absence rates among doctors in primary health care centers (Chaudhury and Hammer 2003), it is not surprising that not too much of a fuss is raised about considerably lower teacher absence rates.

While we appreciate the complexity of these relationships, the purpose of this section is more modest - to empirically examine certain correlates of absence. In that endeavor we highlight four types of factors that could influence whether a teacher show up for work on any given day:

- a. the opportunity cost of time;
- b. the actual costs of getting to work on any particular day;
- c. the sanctions they can expect if they do not show up for work
- d. their own internal sense of responsibility towards their fellow colleagues; to the community they serve.

The set of variables available in our data which we use as proxies are listed in Table 6, and are matched to the underlying factors we believe they represent.

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<sup>20</sup> A common South Asian snack.

<sup>21</sup> Teacher absence is also a problem in developed countries, however, developed country school systems usually have substitute teachers (cite evidence).

**Table 6. Matching variables to factors influencing costs and benefits**

	Opportunity costs	Accessibility	Sanctions	Intrinsic motivation
Rank/Salary Scale (e.g., headmaster versus other teacher)	✓			✓
Education (schooling and certification)	✓			✓
Experience	✓			✓
Tenure	✓			✓
Gender	✓	✓		✓
Residence (proximity to work)		✓		✓
Infrastructure level of the Area in which the School is located	✓	✓		
School Infrastructure				✓
Supervision by Education Officials			✓	
Parent's Education/Wealth	✓		✓	
Parental involvement in Schooling			✓	

Note that most variables have multiple influences on factors which ultimately shape a teacher's decision to show up for work. Take for example the education/wealth level<sup>22</sup> of the parents. Holding all other factors constant, teachers have higher earning opportunities in richer areas, and hence are more likely to skip out of class. On the other hand, if teachers perceive richer parents to have a stronger 'voice' in holding providers accountable (e.g., politically connected; are more involved in child's schooling), they are more likely to show up to school. We cannot discern, a priori, which countervailing effects will dominate.

Besides the cluster of variables mentioned above, we control for other covariates related with demographics (e.g., marital status) and regional effects (which could proxy for a variety of factors ranging from wealth, to infrastructure quality, to level of supervision). We specify primary teacher absence as a function of:

$$P^*(A_{ijt} = 1) = \alpha_0 + \bar{\alpha}_1 T_{ij} + \bar{\alpha}_2 S_{jt} + \bar{\alpha}_3 D_j + \bar{\alpha}_4 I_{jt} + \bar{\alpha}_5 F_j + \bar{\alpha}_6 V_t + \bar{\alpha}_7 R_r + \varepsilon 1_{ijt} \quad (1)$$

$P^*(A)$  represents the probability that teacher  $i$ , belonging to school  $j$ , in time period  $t$ , is absent.  $T$  is a vector of teacher-specific characteristics; note that there is no time index given that besides teacher absence, all other teacher characteristics in our sample are time-invariant (e.g., age is measured in years and both visits were conducted within the same year; time in between visits was too short to observe promotions).  $S$  is a vector of school characteristics; while most characteristics are time-invariant, some vary across the two rounds.  $D$  is a vector of distance variables which proxy for infrastructure/market integration (e.g., distance of school from nearest paved road).  $I$  is vector of proxies for the degree of supervision (e.g., school has never been visited by the officials from the education ministry; school was

<sup>22</sup> We do not have information on household or community wealth. We use asset holdings of pupil's parents as a proxy for wealth.

visited within the last 2 months by officials from the district education office).  $F$  is a vector of pupil parental background characteristics which proxy for the wealth of the community (included in the regression as school level averages).  $V$  is a vector of visit-specific factors (time of visit, day of visit, round number).  $R$  is a vector of region-level dummies which proxy for a wide range factors such as labor market opportunities, infrastructure, and school quality (however, cannot separately identify any one of those factors); and  $\varepsilon_{ijt}$  is the error term (lets ignore the composition the error term for now). We don't observe the latent variable  $P_{ijt}^*$ . We only observe the results of the teacher's evaluation of (1), which is manifest in whether or not the teacher shows up to school:

$$P_i = 1 \text{ if } P_i^* > 0 \quad (2a)$$

$$P_i = 0 \text{ if } P_i^* \leq 0 \quad (2b)$$

Even putting aside the temporal dimension, we should be concerned about two of the three potential components of the error-term:  $\varepsilon_i$  (unobserved teacher-specific heterogeneity),  $\varepsilon_j$  (unobserved school-specific heterogeneity), and the benign  $\varepsilon^{23}$  (normally-distributed error term with mean zero and variance  $\sigma$ ). First of all, given that most of our variables are time-invariant, we have to assume that the latent-effects are uncorrelated with the covariates, i.e., rule out any fixed-effects specification. When completely assume away any unobserved heterogeneity at any level, we simply estimate (2a-b) within a standard probit specification (we report Huber-White robust standard errors correcting for unspecified heteroskedasticity). The assumption that the error term  $\varepsilon$  is iid is a rather strong one, thus, we also present estimates of the model using a random-effects probit specification (where we specify the latent effect at only the teacher level). Teacher absence in secondary schools is empirically modeled along the same vein as described above (without the time subscripts), however, since we have only one round of data we use a standard probit specification.

### ***Regression Results***

We present the primary school random-effects probit regression results in Table 7, and the secondary school probit regression results in Table 8. Since several right-hand side variables are potentially endogenous, we estimate one specification (column 1) without including some variables which are most likely to be endogenous (e.g., whether or not the teacher also works as a private tutor as a side occupation), and another specification which includes all the variables (column 2). Instead of discussing Tables 7 and 8 variable by variable, we discuss several broad results along the factors we discussed above. Again, we refrain from making any causal interpretations given that at best we can highlight the correlation between teacher absence and some specific factors.

### ***Monitoring and Sanctions***

Teachers are 10% more likely to be absent in secondary schools which have never been visited by education officials, highlighting the importance of formal supervision. We have previously mentioned that unlike the governance of primary schools, there are no permanent government staff posted at the sub-district level to monitor secondary schools. In our sample this is manifest by the fact that while only 15% of primary schools have never been visited by the ministry, 59% of secondary schools have never been visited by the ministry.

There might potentially even be a stronger informal supervision effect emanating from the community. Secondary school teachers are 68% less likely to be absent in schools attended by pupils with better educated mothers. Education level of the community is certainly related to the income level of the community, but it also reflects the level of community empowerment and interest of parents in the

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<sup>23</sup> There could be potentially several other latent effects such as community and regional level unobserved heterogeneity. We do control of some community characteristics and include regional dummy variables.



quality of their child's schooling, hence, a potential proxy for direct monitoring of teachers by the parents.

### ***Opportunity Costs***

More “powerful” teachers will be able to protect themselves from the possibility of sanctions, explicit or otherwise, that could be brought to bear on them. We do find that headmasters in both primary and secondary schools are absent much more often than other teachers. Head teachers are the most powerful staff in the schools that they work. This could be an indication of their relative power but could be measuring a number of other characteristics related with outside income earning opportunities and administrative responsibilities.

Teachers who engage in private tutoring as a side occupation are less likely to be absent. This might reflect the fact that teachers might be using class time to recruit clients for their private sessions. It is interesting to note that secondary school teachers who work in schools which are near a train station are 20% more likely to be absent. Besides the obvious (if it is easy for a teacher to hop on a train and take off, he/she will do so), proximity to a train station might be associated with wealthier areas with potentially higher parallel labor market opportunities.

### ***Internal Motivation/ Commitment to the Community***

Having been specifically trained in education (both pre-service training certification and in-service training) leads to better attendance among both primary and secondary school teachers, perhaps reflecting a sense of professional ethos instilled during training. For example, secondary school teachers who have never attended a training program since joining the school are 16% more likely to be absent.

Having been at one's current job for a long time also decreases absence (which may reflect a cultivated sense of being an important part of the community). However, being recruited from the local area has no effect on teacher absence.

**Table 7: Bangladesh Primary School Teacher Absence Regressions**

<b>Random Effects Probit with dependent variable taking on the value 1=Absent; 0=Present</b>		
	<b>(1)</b>	<b>(2)</b>
<b><i>Teacher Characteristics</i></b>		
Head Master	-0.10 (0.52)	-0.01 (0.06)
Male	-0.03 (0.15)	-0.16 (0.76)
Age	-0.01 (0.7)	-0.01 (0.53)
Married	-0.41 (1.41)	-0.26 (0.85)
Born in Thana	-0.05 (0.26)	-0.01 (0.05)
Tenure	-0.02 (1.42)	-0.02 (1.54)
Number of schools taught	-0.13 (2.41)**	-0.13 (2.28)**
Tutors as side occupation		-0.98 (2.54)**

Lives < 2km from school		0.31 (1.88)*
Never attended training	-0.02 (0.07)	-0.07 (0.23)
Attended Training <= 6 months	-0.11 (0.64)	-0.15 (0.83)
Attended Training <= 3 years	-0.23 (1.02)	-0.20 (0.83)
Higher Secondary education	-0.10 (0.5)	-0.08 (0.37)
College education	-0.17 (0.71)	-0.18 (0.73)
Graduate school education	-0.28 (0.87)	-0.20 (0.61)
No certification	0.89 (3.93)***	0.91 (3.80)***
Member of a union	-0.07 (0.41)	-0.15 (0.81)
Teacher met with Parent recently	-0.06 (0.19)	-0.03 (0.07)
<b><i>School Characteristics</i></b>		
Student-teacher ratio	-0.01 (1.29)	-0.00 (1.12)
Percent female students	0.00 (-0.21)	0.00 (-0.34)
Separate toilets for female students	-0.22 (1.28)	-0.20 (1.04)
Drinking water is available	-0.07 (0.35)	-0.14 (0.62)
Electricity is available	-0.19 (0.88)	-0.31 (1.37)
No Teacher Award	-0.11 (0.49)	-0.08 (0.36)
Rural	-0.10 (0.21)	-0.17 (0.32)
Municipality	-0.12 (0.25)	-0.32 (0.62)
Closest main paved road < 1km	-0.19 (0.97)	-0.15 (0.75)
Min of Edu. < 5km	0.00 (0.01)	-0.08 (0.32)
Govt Health Clinic is < 1km	-0.13 (0.49)	-0.20 (0.7)
Private health facility is < 5km	0.00 (0.01)	0.13 (0.59)
Closest bus stop < 5km	-0.01 (0.06)	-0.01 (0.02)
Closest train < 5km	-0.08 (0.27)	-0.11 (0.34)

Closest bank < 5km	0.08 (0.3)	0.12 (0.42)
Post office < 1km	-0.10 (0.46)	-0.10 (0.42)
Closest market < 1km	0.21 (1.01)	0.22 (1.01)
<b><i>Supervision Characteristics</i></b>		
Discipline index		-0.04 (0.53)
Inspection < 2 months		-0.04 (0.07)
Ministry Officer has never visited		-0.11 (0.4)
Employee visited Ministry < 2 months	-0.01 (0.02)	0.06 (0.14)
Staff meeting in last 2 months	-0.23 (1.0)	-0.21 (0.87)
SMC met < 2 months	-0.22 (0.72)	-0.05 (0.17)
PTA has met < 2 months	-0.08 (0.44)	-0.09 (0.47)
<b><i>Student's Family Background</i></b>		
Child's father has no education	-0.53 (0.93)	-0.37 (0.6)
Father's age	-0.01 (0.28)	-0.01 (0.24)
Child's mother has no education	-0.23 (0.4)	-0.13 (0.22)
Mother's age	-0.06 (1.16)	-0.07 (1.22)
Number of brothers	-0.11 (0.52)	-0.18 (0.76)
Number of sisters	-0.20 (1.07)	-0.17 (0.89)
Pukka Floor	-0.44 (0.42)	-0.08 (0.07)
Tin Roof	-0.22 (0.59)	-0.09 (0.23)
Toilet	-0.18 (0.62)	-0.01 (0.04)
Electricity	-0.80 (1.07)	-0.83 (1.0)
Fan	-0.50 (0.54)	-0.64 (0.61)
TV	-0.10 (0.1)	-0.24 (0.22)
Radio	-0.61 (1.15)	-0.63 (1.06)
Chair	-0.44	-0.71

	(0.59)	(0.88)
Clock	-0.50	-0.30
	(0.77)	(0.44)
Bike	0.94	-0.84
	(1.90)*	(-1.6)
Father farmer	-0.64	-0.64
	(1.35)	(1.26)
Child lives < 1km from school	-0.32	-0.09
	(0.66)	(0.17)
<b><i>Visit Factors</i></b>		
Early Morning	-0.02	-0.02
	(-0.09)	(0.06)
Late Morning	-0.16	-0.29
	(0.67)	(1.08)
2nd Visit	0.05	0.05
	(0.31)	(0.28)
Monday interview	-0.19	-0.15
	(0.63)	(0.48)
Tuesday interview	-0.14	-0.22
	(0.53)	(0.76)
Wednesday interview	-0.02	-0.15
	(0.06)	(0.48)
Thursday interview	-0.18	-0.20
	(0.58)	(0.61)
Sunday interview	-0.23	-0.28
	(0.91)	(1.06)
<b><i>Community Literacy and Division Factors</i></b>		
Literacy rate (district avg)	0.00	0.00
	(-0.25)	(-0.14)
Barisal	-0.12	-0.31
	(0.28)	(0.62)
Chittagong	-0.08	-0.01
	(0.24)	(0.03)
Sylhet	-0.09	-0.18
	(0.22)	(0.42)
Dhaka	-0.06	-0.12
	(0.18)	(0.31)
Khulna	-0.09	-0.17
	(0.28)	(0.46)
Constant	-0.48	-0.61
# Observations	753	738
<i>F Tests:</i>		
Day of Week Effect = 0	2.78	2.81
Division Effect = 0	0.49	0.83

Absolute value of z statistics in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 8: Bangladesh Secondary School Teacher Absence Regressions****Probit with dependent variable taking on the value 1=Absent; 0=Present***(Coefficients reported as Marginal Probabilities)*

	(1)	(2)
<b><i>Teacher Characteristics</i></b>		
Head Master	0.081 (1.66)*	0.081 (1.64)
Teacher	-0.042 (1.25)	-0.052 (1.54)
Assistant Head Teacher	-0.02 (0.5)	-0.024 (0.64)
Male	0.005 (0.15)	-0.003 (0.09)
Age	0.004 (1.95)*	0.004 (1.83)*
Married	0.074 (2.87)***	0.072 (2.81)***
Hindu	-0.012 (0.45)	-0.002 (0.07)
Born in Thana	-0.018 (0.8)	-0.022 (0.98)
Tenure	-0.007 (3.15)***	-0.006 (2.77)***
Number of schools taught	(0.08) (4.15)***	(0.081) (4.20)***
Tutors as side occupation		0.017 (0.59)
Lives < 2km from school		-0.012 (0.55)
Never attended training	0.16 (4.88)***	0.16 (4.94)***
Training <= 6 months	0.167 (2.23)**	0.167 (2.27)**
Training <= 3 years	-0.006 (0.18)	-0.004 (0.12)
Higher secondary education	-0.071 (0.85)	-0.066 (0.78)
College Education	-0.038 (0.33)	-0.031 (0.28)
Post Graduate education	-0.06 (0.66)	-0.056 (0.63)
No certification	0.042 (1.82)*	0.041 (1.76)*
Member of a union	0.011 (0.39)	0.017 (0.59)
Parent-teacher interaction this month	-0.166 (2.09)**	-0.187 (2.34)**

### ***School Characteristics***

Student-teacher ratio	0 (0.15)	0 (0.05)
Percent females students	-0.001 (1.15)	-0.001 (0.6)
School charges a fee	-0.101 (1.29)	-0.043 (0.61)
No Teacher Award	0.033 (0.94)	0.013 (0.36)
Separate toilets for female students	0.014 (0.33)	-0.025 (0.52)
Drinking water is available	-0.342 (3.19)***	-0.341 (3.24)***
Electricity is available	0.03 (0.81)	0.029 (0.77)
Rural	0.154 (2.37)**	0.157 (2.45)**
Municipality	-0.124 (1.03)	-0.091 (0.77)
Paved road < 1 km	-0.021 (0.54)	-0.026 (0.64)
Education min < 5km	-0.02 (0.53)	-0.033 (0.89)
Public health facility < 1km	-0.026 (0.7)	-0.024 (0.66)
Bus Stop < 5km	-0.091 (1.75)*	-0.106 (2.01)**
Bank < 5km	0.056 (1.4)	0.052 (1.3)
Post Office < 1km	0.033 (0.75)	0.038 (0.78)
Private health facility < 5km	-0.121 (3.26)***	-0.113 (3.00)***
Market < 1km	-0.066 (1.84)*	-0.069 (1.81)*
Train Station < 5km	0.157	0.2

### ***Supervision Characteristics***

Discipline index		0 (-0.07)
Inspection < 2 months		-0.051 (0.76)
Ministry Officer has never visited		0.106 (2.04)**
Employee visited Min < 2 months	-0.21 (2.03)**	-0.298 (2.63)***
Staff meeting < 2 months	-0.032 (0.55)	-0.006 (0.09)
SMC meeting < 2 months	-0.044	-0.03

PTA meeting < 2 months	(0.64) -0.221 (2.91)***	(0.41) -0.269 (3.38)***
<b><i>Student's Family Background</i></b>		
Father completed higher secondary education and beyond	-0.031 (0.28)	0.015 (0.13)
Father's age	-0.005 (0.59)	-0.001 (0.1)
Mother completed higher secondary education or beyond	-0.63 (2.28)**	-0.702 (2.44)**
Mother's age	0.014 (1.45)	0.011 (1.15)
Number of brothers	0.018 (0.59)	0.023 (0.76)
Number of sisters	0.014 (0.48)	0.022 (0.69)
Pukka Floor	0.246 (2.22)**	0.243 (2.21)**
Tin Roof	0.135 (1.99)**	0.115 (1.69)*
Toilet	-0.047 (0.78)	-0.071 (1.13)
Fan	-0.271 (1.64)	-0.326 (1.90)*
TV	0.184 (1.83)*	0.236 (2.12)**
Radio	-0.045 (0.61)	-0.061 (0.81)
Electricity	0.124 (0.79)	0.171 (1.07)
Chair	-0.021 (0.09)	-0.125 (0.45)
Clock	0.429 (1.82)*	0.465 (2.02)**
Bike	-0.252 (2.65)***	-0.245 (2.46)**
Father farmer	0.09 (1.29)	0.085 (1.22)
Child lives < 1km from school	-0.079 (1.18)	-0.142 (1.98)**
<b><i>Visit Factors</i></b>		
March-April	(0.171) (2.24)**	(0.132) (1.86)*
May	0.131 (2.23)**	0.138 (2.36)**
Early Morning	-0.03 (0.68)	-0.016 (0.33)
Late Morning	-0.052	-0.056

	(1.36)	(1.46)
Monday interview	0.114	0.138
	(1.81)*	(2.10)**
Tuesday interview	-0.014	0.012
	(0.28)	(0.21)
Wednesday interview	0.035	0.158
	(0.54)	(1.79)*
Thursday interview	0.328	0.382
	(3.14)***	(3.41)***
Sunday interview	-0.034	-0.02
	(0.77)	(0.46)
<b><i>Community Literacy and Division Factors</i></b>		
Literacy rate (7+)	0.001	0.001
	(3.98)***	(4.45)***
Barisal	-0.161	-0.154
	(3.81)***	(3.44)***
Chittagong	-0.145	-0.158
	(2.54)**	(2.82)***
Sylhet	-0.099	-0.106
	(2.03)**	(2.52)**
Dhaka	(-0.099)	(-0.1)
	(1.86)*	(1.90)*
Khulna	(-0.101)	(-0.099)
	(2.08)**	(2.01)**
Observations	919	919
<i>F Tests:</i>		
Day of Week Effect=0	18.61**	20.70***
Divisions=0	15.87**	14.39*

Robust z statistics in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

## 6. What Difference Does it Make? Impact on Test Scores

While there are no internationally comparable test scores from primary or secondary schools in Bangladesh, some of the rare studies on schooling achievement suggest that many students complete schooling without having acquired basic mathematical, reading or writing skills. For example, Greany, Khandker, and Alam (1999) found that 70 percent of students in their sample who had completed fifth grade were not minimally competent in writing. Apparently quality also varies by type of school management. A BRAC report finds that low-cost (per-unit) NGO schools manage to produce better achievement results than higher-cost public primary schools (cite BRAC). Comparability is however, not so straightforward given that the pupil cohort attending private/NGO run schools is potentially different than those attending public primary schools (e.g., many students attending BRAC schools are older students who had dropped out of the education system and are now going back to school; differences in motivation, ability).

There is serious concern that the quality of government-aided secondary schools is dismal. On average 40% of students pass the secondary school leaving examination. A recent study by the Government of Bangladesh (cite GoB) shows that some government-aided secondary schools continue to receive



funding despite being unable to produce a single pupil who can pass the exam<sup>24</sup>. Besides pass rates, we know virtually nothing about what pupils actually learn in these secondary schools (in terms of mathematical/literacy skills). Another widely held belief is that government managed secondary schools are better than government-aided private schools. The public sector manages (aids and delivers) some excellent secondary schools which are referred to as ‘model’ schools. These secondary schools are located in the district headquarters and are meant to serve as models of excellence to be emulated by other schools in the district. Given that the public sector can focus its resources and management effort on operating only a few of these elite secondary schools, again akin to primary schools, makes it difficult to compare school quality between public and private managed secondary schools (Asadullah 2004). Anyway, we do not have government managed secondary schools in our sample, nor do we have private/NGO managed primary schools in our sample. Given the data that we do have, we can explore the impact of teacher absence on certain measures of school achievement within public primary and government-aided private secondary schools. We use average teacher absence in the school to proxy for accountability and institutional oversight. Unlike the analysis in the previous section where we were averse towards assigning causality, in this case we are more comfortable about the direction of the effect. It is unlikely that low test scores lead to higher teacher absence, rather we can make a reasonably strong argument that teacher absence should adversely effect student learning.

In primary schools grade progression is virtually automatic, so there is no reason to examine the effect of teacher absence on primary school leaving examination rates (furthermore, there is essentially no variation in our sample). Secondary school completion examination (SSC) pass rates have remained remarkably constant over a long period of time in Bangladesh. There are deep structural factors which we will certainly be unable to control for given the limited information in our sample. Furthermore, the SSC pass rate is at the school level, hence our regression sample would be quite small. While we still go ahead and examine the impact of teacher absence on SSC pass rates, our main focus in this section is on relating the impact of teacher absence on outcomes from a basic mathematics and literacy test that we administered on a random subset of 5<sup>th</sup> and 10<sup>th</sup> grade students.

### ***SSC Examination Pass Rates***

We use a parsimonious specification to estimate the determinants of SSC pass rates at the school level. Regression results are presented in Table 9<sup>25</sup>. While school-level teacher absence rate has the expected negative effect on the pass rate, the magnitude is both small and insignificant. Pass rates are higher in secondary schools with separate toilets for males and females, probably reflecting the quality of the school environment. Both rural and municipal schools fair worse compared to secondary schools located in major metropolitan areas.

### ***Mathematics and Language Test***

We estimate the probability that the pupil correctly answers all the math and language questions as a function of the following:

$$P^*(C_{cj} = 1) = \beta_0 + \beta_1 Male_{cj} + \bar{\beta}_2 F_{cj} + \bar{\beta}_3 S_j + \bar{\beta}_4 D_r + \varepsilon 2_{cj} \quad (3)$$

$P^*(C)$  represents the probability that pupil  $c$  in school  $j$  correctly answers all the questions on the respective tests.  $Male$  is a binary indicator variable which takes on the value of 1 when the pupil is male.  $F$  is a vector of pupil family background variables.  $S$  is a vector of school characteristics, including average teacher absence rate.  $D$  is a vector of regional dummies. Finally, we assume that  $\varepsilon 2$  is an iid error term. Given the cross-section nature of our test data, we cannot control for any latent effects

<sup>24</sup> We only have one such school in our sample.

<sup>25</sup> Variable means are presented in Appendix Table A6.

masked in the error term (we do report Huber-White robust standard errors correcting for unspecified heteroskedasticity).

We present the primary school pupil performance results in Table 10<sup>26</sup>. Teacher absence has a detrimental effect on the English language tests. A one percent increase in (average) teacher absence leads to a 38% reduction in the likelihood that the pupil will correctly answer the English writing test; while a one percent increase in the teacher absence rate leads to a 67% reduction in the likelihood that the pupil will correctly answer the English reading test.

Pupils with uneducated mothers are 7% less likely to correctly answer all the multiplication questions; while in general pupils with uneducated parents are less likely to be able to correctly answer the English writing and language test. Pupils with older mothers are less likely to pass the English reading test, possibly reflecting the fact that older mothers are less likely to be exposed to English. We do find a strong effect of parental involvement in child schooling - parents who have met with the teacher within the past month of the survey are 7% more likely to pass the English writing exam. Interestingly we notice an adverse sibling effect which could potentially proxy for resource/parental time constraints. Pupils who live close to the school are 7% more likely to pass the addition test. Pupils who come from homes which own a clock and a bike, are 12% and 8% more likely to correctly answer the English reading test, respectively.

Larger class-size has an adverse effect on the English language tests, while it increases the likelihood of correctly answering the multiplication test. The class-size and student performance relationship is one of the most thoroughly examined and yet still unresolved relationship in the schooling literature, hence, we desist from discussing this effect any further. Pupils coming from schools which have separate toilets for female students are 6% more likely to correctly answer the multiplication test, and pupils belonging to schools which have drinking water are 5.6% more likely to correctly answer the addition test, the other school infrastructure variables have conflicting effects. Surprisingly, pupils coming from rural schools are more likely to correctly answer the multiplication test, while pupils coming from metropolitan schools are more likely to correctly answer the addition test. Pupils coming from Dhaka and Chittagong, the two most affluent and modernized districts, are not surprisingly more likely to correctly answer the English language tests.

We present the secondary school pupil performance results in Table 11<sup>27</sup>. Even though teacher absence has the expected negative effect on 3 out of the 4 test, none of the effects are statistically significant. We do, however, find strong pupil, family background, and location effects. Male pupils are more likely to do better in the mathematics tests, while female pupils are more likely to do better in the English reading test. While female pupils in our sample fared better in the English tests, surprisingly pupils who come from schools with a high fraction of female students are less likely to correctly answer the English language tests.

Pupils with better educated parents are more likely to pass the English writing test. Similar to the primary school results, we also find a strong effect of parental involvement in child schooling - parents who have met with the teacher within the past month of the survey are 6% more likely to correctly answer all the questions on the multiplication test.

Pupils who come from households which own a radio are 10% more likely to correctly answer the English reading test. This could reflect both household wealth effects and also greater exposure to English via the radio. While pupils coming from schools which have drinking water are 16% more likely to correctly answer the addition test, and pupils belonging to schools with working electricity are 12.5% more likely to correctly answer the addition test, the other school infrastructure variables have conflicting effects. There are strong, and surprising location effects. For example, pupils coming from

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<sup>26</sup> Variable means are presented in Appendix Table A6.

<sup>27</sup> Variable means are presented in Appendix Table A7.

Dhaka schools are less likely to correctly answer the addition and English writing test – which seems quite improbable.

**Table 9. SSC Exam Pass Rate Regressions**

School-level OLS Regression with dependent variable being the % of students who passed the Secondary School Leaving Examination ( $100 * [\# \text{ Passed Exam} / \# \text{ Took the Exam}]$ ).

<b>Teacher Absence Rate (School Avg)</b>	-2.444 (0.21)
Separate toilets	7.777 (1.79)^
Electricity	3.144 (0.76)
Student to teacher ratio	-0.116 (0.91)
Percent girl students	-0.003 (0.03)
Father has >=HSC education (school avg)	0.406 (0.03)
Mother has >=HSC education (school avg)	36.271 (1.44)
Child lives<=1km (school avg)	9.914 (1.30)
Rural	-14.247 (2.20)*
Municipality	-25.784 (3.46)**
Division: Barisal	-8.534 (1.32)
Division: Chittagong	-6.187 (1.23)
Division: Sylhet	9.143 (1.31)
Division: Dhaka	3.377 (0.70)
Division: Khulna	19.251 (3.09)**
Constant	41.265 (3.57)**
Observations	97
R-squared	0.37

Absolute value of t statistics in parentheses

\* significant at 5%; \*\* significant at 1% ; ^ significant at 10%

**Table 10. Primary School Student Test Regressions**

Probit Regression Results from 4 Tests: Multiplication, Addition, English Writing, and English Reading. Dependent variable takes on the values: 1 = If Pupil Correctly Answered the Test; 0 = Otherwise; (note coefficients reported as marginal probabilities)

	<b>Multiplication</b>	<b>Addition</b>	<b>Writing</b>	<b>Reading</b>
Boy student	0.028 (1.16)	0.024 (1.09)	0.001 (0.03)	0.069 (1.91)^
<i>Parental Education and Age</i>				
Father has No Education	-0.028 (0.77)	-0.056 (1.54)	-0.085 (1.75)^	-0.179 (3.45)**
Father has Informal Education	-0.005 (0.14)	-0.016 (0.48)	-0.040 (0.89)	-0.152 (3.04)**
Father's Age	0.001 (0.25)	0.000 (0.01)	0.004 (0.78)	0.005 (1.04)
Mother has No Education	-0.068 (1.71)^	0.030 (0.84)	-0.113 (2.29)*	-0.056 (1.03)
Mother has Informal Education	-0.069 (1.72)^	-0.017 (0.51)	-0.076 (1.69)^	-0.099 (1.90)^
Mother's Age	-0.000 (0.03)	-0.000 (0.01)	-0.008 (1.47)	-0.012 (1.96)^
Number of Siblings	-0.011 (1.39)	-0.008 (1.21)	-0.006 (0.61)	-0.026 (2.18)*
<i>Family Housing and Assets</i>				
Pupil Lives <=1 km from school	0.013 (0.35)	0.069 (1.92)^	-0.056 (1.19)	0.031 (0.56)
Concrete House	0.011 (0.18)	-0.005 (0.10)	0.119 (1.41)	0.066 (0.72)
Radio	-0.019 (0.71)	0.019 (0.78)	-0.002 (0.06)	0.031 (0.82)
Chair	0.046 (1.42)	0.011 (0.37)	0.011 (0.24)	0.003 (0.05)
Clock	-0.014 (0.45)	-0.033 (1.11)	0.052 (1.14)	0.121 (2.33)*
Bike	-0.011 (0.39)	-0.005 (0.19)	0.032 (0.88)	0.081 (2.01)*
<i>School Characteristics</i>				
<b>Teacher Absence Rate</b>	0.001 (0.01)	0.101 (1.00)	-0.382 (2.63)**	-0.666 (3.93)**
Student-Teacher ratio	0.001 (2.53)*	0.000 (0.77)	-0.002 (3.15)**	-0.002 (2.34)*
% Female Students	0.000 (0.07)	0.002 (0.88)	-0.003 (0.96)	0.002 (0.51)

Table 10. Continued

Teacher has interacted with the Pupil's parents in the last month	-0.005 (0.21)	0.013 (0.56)	0.072 (2.09)*	0.028 (0.73)
Separate Toilet Female Students	0.063 (1.86)^	0.018 (0.58)	0.009 (0.21)	0.059 (1.17)
Drinking Water Available	0.031 (0.86)	0.056 (1.74)^	-0.017 (0.34)	0.084 (1.50)
Working Electricity	0.221 (1.14)	-0.566 (2.64)**	0.329 (1.31)	0.611 (2.13)*
Playground	-0.121 (2.90)**	-0.001 (0.04)	0.011 (0.20)	-0.051 (0.86)
Fans	-0.137 (0.71)	0.619 (2.87)**	-0.291 (1.15)	-0.563 (1.96)*
<i>Location</i>				
Rural	0.102 (1.66)^	0.062 (1.21)	-0.070 (0.96)	-0.065 (0.82)
Municipality	0.072 (1.40)	0.073 (1.65)^	-0.033 (0.43)	0.035 (0.40)
Barisal	-0.080 (1.49)	-0.038 (0.80)	0.068 (0.98)	-0.023 (0.31)
Chittagong	-0.029 (0.71)	-0.082 (2.07)*	0.213 (3.86)**	0.025 (0.44)
Sylhet	-0.015 (0.24)	0.031 (0.42)	0.041 (0.38)	-0.012 (0.10)
Dhaka	-0.056 (1.40)	-0.061 (1.64)	0.124 (2.41)*	0.096 (1.72)^
Khulna	0.023 (0.54)	-0.096 (2.11)*	0.201 (3.18)**	0.284 (4.33)**
Observations	860	860	860	860

Absolute value of z statistics in parentheses

\* significant at 5%; \*\* significant at 1% ^ significant at 10%

**Table 11. Secondary School Student Test Regressions**

Probit Regression Results from 4 Tests: Multiplication, Addition, English Writing, and English Reading. Dependent variable takes on the values: 1 = If Pupil Correctly Answered the Test; 0 = Otherwise; (note coefficients reported as marginal probabilities)

		<i>Multiplication</i>	<i>Addition</i>	<i>Writing</i>	<i>Reading</i>
Boy student		0.143 (3.82)**	0.119 (3.91)**	-0.027 (3.17)**	-0.124
<i>Parental Education and Age</i>					
Father >= High School Education	0.008	0.054 (0.15)	0.104 (1.35)	0.079 (1.96)*	
Father's Age	0.002	-0.005 (0.41)	-0.006 (1.49)	-0.003 (1.23)	
Mother >= High School Education	0.008	-0.113 (0.07)	0.202 (1.17)	0.192 (1.76)^	
Mother's Age	-0.003	0.003 (0.50)	0.006 (0.78)	0.004 (1.10)	
Number of Siblings	-0.016	-0.007 (1.60)	-0.005 (0.84)	-0.011 (0.51)	
<i>Family Housing and Assets</i>					
Pupil Lives <=1 km from school	-0.018	-0.028 (0.48)	0.036 (0.92)	0.048 (0.91)	
Concrete House	0.028	0.047 (0.50)	-0.018 (1.01)	-0.003 (0.32)	
Radio		-0.014 (0.36)	0.059 (0.57)	0.099 (1.43)	
Chair		0.009 (0.06)	0.027 (0.23)	0.091 (0.59)	-0.070
Clock		0.024 (0.21)	0.196 (1.87)^	0.235 (2.08)*	-0.117
Bike		0.016 (0.41)	-0.010 (0.31)	-0.071 (0.44)	
<i>School Characteristics</i>					
Teacher Absence Rate	-0.118	0.048 (0.98)	-0.083 (0.64)	-0.132 (1.07)	
Student-Teacher Ratio	0.001	-0.002 (1.06)	-0.000 (1.46)	-0.000 (0.33)	
% Female Students		-0.000 (0.15)	-0.003 (0.35)	-0.003 (3.53)**	
Separate Toilet Female Students	0.063	-0.013 (1.34)	0.075 (0.34)	-0.050 (1.55)	
Drinking Water Available	0.020	0.160 (0.30)	0.076 (2.56)*	0.088 (1.15)	

**Table 11. Continued**

Working Electricity	0.052	0.125	-0.085	-0.025	
	(0.74)	(2.07)*	(1.13)	(0.35)	
Playground	-0.083	-0.101	-0.269	-0.170	
	(0.70)	(1.18)	(2.11)*	(1.41)	
Fans	-0.028	0.001	0.100		0.215
	(0.46)	(0.03)	(1.49)	(3.19)**	
Teacher has interacted with the Pupil's parents in the last month	0.062	-0.008	0.060	0.018	
		(1.73)^	(0.27)	(1.60)	(0.49)
<i>Location</i>					
Rural		-0.054	-0.009	-0.003	-0.001
		(0.76)	(0.15)	(0.04)	(0.01)
Municipality	-0.126	0.108	-0.056	0.046	
		(1.45)	(1.67)^	(0.66)	(0.53)
Barisal	-0.032	0.026	0.014		-0.194
		(0.43)	(0.45)	(0.18)	(2.51)*
Chittagong		-0.177	-0.088	0.133	0.192
		(2.95)**	(1.77)^	(2.20)*	(3.39)**
Sylhet	0.030	-0.009	0.284		-0.038
		(0.38)	(0.13)	(3.59)**	(0.47)
Dhaka		-0.065	-0.078	-0.099	-0.018
		(1.21)	(1.69)^	(1.82)^	(0.33)
Khulna	-0.095	0.137	0.113		0.181
		(1.30)	(2.66)**	(1.56)	(2.80)**
Observations	836	836	836	836	836

Absolute value of z statistics in parentheses

\* significant at 5%; \*\* significant at 1% ^ significant at 10%

## 7. Summary and Conclusions

We draw upon an unique survey in which we made unannounced visits to a sample of government run primary schools and private run (government-aided) secondary schools in Bangladesh with the intention of documenting the fraction of teachers who were actually present at the school. The survey represents the first attempt to quantify the extent of this problem on a nationally representative scale in Bangladesh. Besides contributing to the nascent empirical literature on provider absence, this study highlights the fact that service delivery problems stemming from problems in incentives and accountability cut across both the public and private sector.

We have two rounds of data on the same set of primary schools, while we only have one round of data on secondary schools. The average teacher absence rate in primary school is 15.5%. The absence rate is highest among headmasters (20%). Our cross-section survey on secondary schools reveal teacher attendance problems which are as prevalent, if not more so compared to primary schools. The average secondary school teacher absence rate is 17.6%, with assistant teachers (19.3%) and headmaster (17.8%) having the highest absence rates. The teacher absence rate in secondary schools increases as one moves from major metropolitan areas (10.8%), to small towns (13.5%), to rural areas (19%),

reflecting the fact that remote schools are less likely to be supervised by education officials. Cross-sectional averages certainly mask the extent of this problem. In primary schools where we have panel data, we find that 23.5% of primary school teachers were absent during at least one of the two visits.

While in primary schools no reasons were given for only 2% of the teachers' absences, no reasons could be given for 20% of the teacher absences in secondary schools. The predominant reason given for why the teacher was not in school during the day of the visit was that the teacher was away performing official duties. We did not further check into the veracity of the reasons given for the absence, however, in the South Asian context one often hears about the fact that government teachers are pulled away from classrooms for a variety of reasons.

We then explore for correlates of teacher absence. Only provider characteristics emerge as significant correlates of primary school teacher absence. For example, primary school teachers without teaching certificates (which are actually a requirement for the job) are 18% more likely to be absent. Besides provider characteristics, school, community, and location effects are strong correlates of secondary school teacher absence. For example, Secondary school teachers are 68% less likely to be absent in schools with better educated mothers. We find a strong supervision effect in secondary schools—teachers are 10% more likely to be absent in schools which have never been visited by education officials.

Finally we estimate the impact of teacher absence on school examination pass rates and a basic mathematics and language test that we administered to a subset of 5<sup>th</sup> and 10<sup>th</sup> grade students. We do not find any significant effect of teacher absence on Secondary School Completion (SSC) examination pass rates. We do find that teacher absence has a significant adverse effect on English language test scores in primary schools. While we also find a negative effect of teacher absence on secondary school test scores, the effect is not significant.

One often hears about various policy prescriptions which will supposedly usher in better accountability and reduce shirking by providers. This study has allowed us to examine three such prescriptions:

*(1) Need to increase salaries*

In primary schools we find that the absence rate is highest among headmaster who are the highest paid staff in the school. So in primary schools, our immediate focus should be on finding out if there are really official reasons which interfere with the workday of headmasters rather than on their salary. Salaries already account for 97% of the overall recurrent expenditures in education – it is unlikely that the Government of Bangladesh will be able to increase that share even further. Even if new funding becomes available, the Government of Bangladesh should first fix this institutional problems which takes 20% of its headmasters away from the school on any given day. We do at least have some basis for a salary argument in secondary schools where the absence rate is highest among the lowest paid category of staff (assistant teachers) – the second highest absence rate is still among headmasters (the highest paid category of teachers). While in public schools we have less dispersion in terms of staff categories (one headmaster, the rest being regular teachers), there are sharper wage differentiated categories in secondary schools. There might be a problem of moral hazard in having low-paid assistant teachers (with limited opportunities to climb up the career ladder) working along higher paid teachers, assistant headmasters, and headmaster.

*(2) More teacher training*

The international experience of the impact of teacher training on staff quality and schooling outcomes is quite weak, and if anything it has been shown to be an ineffective policy tool in South Asia (World Bank 2004). We do, however, find that teachers who have never received any training since joining the secondary school are 16% more likely to be absent. In the Bangladeshi secondary



school context, we need a better understanding of the various types of training available for teachers, how teachers are selected for training, whether or not that selection is linked with other performance criterion, and what are the specific components of the training module that may help to boost staff motivation.

(3) *Leave it to the private sector*

The dysfunctional track-record of public service delivery in many developing countries should not serve as ideological fodder for privatization. Some developed countries such as France have well functioning public primary school systems while other developed countries such as The Netherlands have equally well functioning private managed (government-aided) primary school systems. In our study we could not compare differences in management within schooling level (e.g., government run primary schools vs. private run primary schools). We have pointed out that even if we had such data, comparison might be difficult given the fact that cohorts/schools might not be comparable (e.g., a few elite ‘model’ government run secondary schools vs. a horde of private managed secondary schools which have been set up for a variety of reasons<sup>28</sup>). Anyway, most primary school students attend government run schools, while most secondary school students attend private run (government-aided) schools. What we can point out, however, is that the private sector does not automatically lead to better accountability. In our sample we find that private run secondary schools have comparable, if not higher rates of teacher absence compared with government primary schools. It is not about public vs. private, rather it is about strengthening the institutional capacity to hold providers accountable. What we could benefit from are rigorous political-economy studies which pry into the nature of incentives facing a variety of actors ranging from national and sub-regional policymakers, school administrators, to front-line teachers.

Although this study highlights a lot of things that we do not know about the institutional causes and scholastic consequences of teacher absence, we can say emphatically that the incidence of teacher absence that we have documented in this study is in itself a ‘social bad’. This is not as trivial as it sounds. In the health sector for example, the welfare effect of doctor absenteeism in public facilities is ambiguous. Government salaries could be viewed as a public subsidy to get doctors to set up private practice in undesirable localities. Theoretical work suggests that such doctors might even help in sorting higher-income patients to the private sector, thereby resulting in better targeting of public expenditures to the poor<sup>29</sup> (Bir and Eggleston 2003; Blomqvist 1991). We know from household data, particularly in South Asia, that many (if not most) households seek health care outside of public health facilities. However, unlike the health sector, household data indicates that most Bangladeshi parents educate their children in public primary schools and government-aided private run secondary schools. At best, teacher absence in these schools may reduce the quality of teaching (heavier teaching load to be shouldered by teachers who do show up for work), and at worst reduce the quantity of teaching (when teachers who do show up for work cannot make up classes for teachers who don’t). We need more careful monitoring of the most expensive supply-side input into child schooling.

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<sup>28</sup> Doctors often vigorously campaign for membership in the school management committees where they can use their position to cultivate clients.

<sup>29</sup> We should mention that even though it might be theoretically possible, there is little empirical evidence that doctors mostly charging or steering richer patients to the private sector – existing empirical evidence would rather point to the contrary.

**Appendix Table A1. Primary and Secondary School Sample Averages**

<b>Teacher Demographic Profiles</b>	<b>Primary</b>	<b>Secondary</b>
Age	41.4	40.5
Male	61.2%	86.9%
Female	38.8%	13.1%
Married	90.6%	86.5%
Average number of children	2.9	2.8
Teacher has primary side occupation	45.2%	68.8%
Teacher tutors as primary side occupation	8%	17.1%
Teacher has agricultural primary side occupation	28.6%	40%
Born in Thana	66.3%	62.9%
Born in District	15%	17.2%
Lives in Thana	89.6%	86.5%
Lives in District	8.1%	10%
Years living in current place	31.5	31.6
Kilometers teacher lives away from work	4.5	3.4
<b>Teacher Training and Certification Qualifications</b>	<b>Primary</b>	<b>Secondary</b>
<i>Experience</i>		
Number of years in the teaching profession	18.9	16.2
Number of years teaching at this school	9.3	14
Number of schools at which teacher has taught	3.1	1.4
<i>Certification</i>		
Number of teachers that have no degree	13.2%	44.2%
Number of teachers that have primary degree	78.3%	2.5%
Number of teachers that have B. Ed degree	7.7%	50.7%
Number of teachers that have M. Ed degree	.8%	2.6%
<i>Education Level</i>		
Highest level of education: below SSC	1.4%	0%
Highest level of education: secondary	31.3%	.83%
Highest level of education: higher secondary education	27.8%	9.7%
Highest level of education: college	30.1%	75.5%
Highest level of education: post-college	9.5%	13.9%
<i>Training</i>		
Teacher has never attended training since work began	12%	34.2%
Teacher has attended training in last 6 months	28.9%	4.7%
Teacher has attended training in last year	22.2%	3.2%
Teacher has attended training in last 3 years	12.7%	13.7%

**Appendix Table A1. Continued**

Teacher has attended training in last 5 years	4.4%	12.8%
Teacher has attended training in last 10 years	15.3%	24.8%
Teacher has attended training more than 10 years ago	4.5%	5.6%
<b>School and Facility Characteristics</b>	<b>Primary</b>	<b>Secondary</b>
Ave number of years facility has been established	57.2	33.6
<i>School Type</i>		
Government run regular school	100%	5.4%
Private school but government run	0%	93.6%
Private, recognized but not aided school	0%	1%
<i>School Size</i>		
Number of students in class of Standard 1	88.2	117.8
Number of students in class of Standard 2	77.4	100.9
Number of students in class of Standard 3	73.5	92.7
Number of students in class of Standard 4	63.5	84.3
Number of students in class of Standard 5	52.8	69.7
Percent of female students in Standard 1	51.2%	50.6%
Percent of female students in Standard 2	49%	55.2%
Percent of female students in Standard 3	51.3%	52.9%
Percent of female students in Standard 4	61%	54.1%
Percent of female students in Standard 5	54%	50.9%
Ave number of teachers per school	5.1	12
Ave number of students per school	355.3	465.6
Average student to teacher ratio	69:1	39:1
<b>School Characteristics</b>		
Covered roofs	99.6%	100%
Non-dirt floors	95.8%	89%
Benches	99.6%	100%
Mats	10.3%	0%
Blackboards	99.6%	100%
Chalk	100%	100%
Toilets	97.2%	100%
Separate toilets for girls	46%	80.3%
Water	81.4%	92.1%
Electricity	39.1%	65.5%
Lights	35.8%	67.7%
Fans	40.1%	65.3%
Playground	75.9%	98.2%
Library	.4%	40%
Maps	99.9%	97.9%
Toys	77.2%	99.1%

**Appendix Table A1. Continued**

Instruments	12.7%	48.4%
Computers	0%	25.2%
Office for head teacher	99.1%	99.1%
Staff room	14.6%	69.4%

**Local Infrastructure**

	<b>Primary</b>	<b>Secondary</b>
School is located next to a paved road	42.9%	25%
Paved road is less than 1 km away	22.7%	49.6%
Paved road is less than 5 km away	28%	18.3%
Closest health care facility is less than 1 km away	18.6%	28.9%
Closest health care facility is less than 5 km away	52.4%	46.2%
Private health facility is less than 1 km away	14.4%	17.13%
Private health facility is less than 5 km away	33.5%	34.7%
District hospital is less than 5 km away	3.4%	7%
District hospital is less than 15 km away	18.3%	16%
District hospital is less than 100 km away	51.3%	23.8%
Bus stop is at this location	4.2%	1%
Bus stop is less than 1 km away	18.6%	35.3%
Bus stop is less than 5 km away	40.2%	36.9%
Train station is less than 1 km away	2.9%	8.8%
Train station is less than 5 km away	17%	11.6%
Bank is at this location	4.6%	3.1%
Bank is less than 1 km away	19.2%	24.4%
Bank is less than 5 km away	44.6%	42%
Post office is at this location	6.9%	37.3%
Post office is less than 1 km away	29.7%	46.8%
Post office is less than 5 km away	57.4%	39.9%
Market is at this location	11.1%	4.2%
Market is less than 1 km away	42.4%	64%
Market is less than 5 km away	41%	29.8%
Education Ministry is less than 1 km away	10.3%	5.7%
Education Ministry is less than 5 km away	18.5%	21.4%
Education Ministry is less than 15 km away	54.7%	40.5%
Closest college is here	3.7%	3.1%
Closest college is 1 km away	14.5%	20.1%
Closest college is 5 km away	48.2%	48.7%

**Disciplinary Action**

	<b>Primary</b>	<b>Secondary</b>
Dismissal	.7%	6%
Suspension	1.1%	10.1%
Transferal	5.2%	1%
Salary suspension	2.8%	7.3%
Verbal warning	75.4%	27.4%
Written warning	8.8%	88.7%

**Appendix Table A1. Continued**

<b>Supervision</b>	<b>Primary</b>	<b>Secondary</b>
Facility has never been visited by official inspector	.6%	15.6%
Facility has been visited by official inspector in last 2 months	58.1%	36.3%
Facility has been visited by official inspector in last 6 months	33%	17.2%
Facility never been visited by Ministry of Edu Officer	84.3%	40.8%
Facility visited by Ministry of Edu. Officer in last 2 months	.9%	5%
Facility visited by Ministry of Edu. Officer in last 6 months	2.2%	6.2%
Teacher has never visited Ministry of Edu. office	1%	2.6%
Teacher has visited Ministry of Edu. office in last 2 months	96.4%	90.1%
Teacher has visited Ministry of Edu. office in last 6 months	1.2%	4.2%
School has no PTA or it has never met	13.8%	35.8%
Last PTA meeting was in the last 2 months	39.1%	22.4%
Last PTA meeting was in the last 6 months	36%	25.5%
School does not have staff meetings	15.5%	11.1%
School has had a staff meeting in the last 2 months	75.4%	73.2%
School has had a staff meeting in the last 6 months	7.2%	11.6%
School has no School Management Committee	1.5%	1.4%
Last SMC meeting was in the last 2 months	90.6%	77.9%
Last SMC meeting was in the last 6 months	7.1%	12.9%
<b>Child Characteristics</b>	<b>Primary</b>	<b>Secondary</b>
Parent has personally spoken with teacher	93.5%	90.5%
Father is literate	69.5%	87.9%
Mother is literate	59.6%	79%
Father's age	43.3	47.9
Mother's age	35.6	38.7
Father is dead	4.0%	4.8%
Mother is dead	.8%	.7%
Father has completed no level of education	30.7%	12.2%
Mother has completed no level of education	40.6%	21.1%
Father has completed non-formal education	24.7%	14.7%
Mother has completed non-formal education	28.2%	23.1%
Father has completed class V-X education	29.8%	40.7%
Mother has completed class V-X education	25.7%	44.7%
Father has completed HSC education	3.5%	8.5%
Mother has completed HSC education	1.0%	1.9%
Father has completed college degree or above	3.5%	8.1%
Mother has completed college degree or above	.4%	1.3%
Ave child's family income	39025.6	60979.9
House: Pukka (concrete)	5.4%	14.2%
House: Mixed (concrete/mud)	14.6%	18.3%
House: Kucha (mud)	51.5%	38.2%

### Appendix Table A1. Continued

House: Tin	28.5%	29.3%
Number of sisters	2.0	2.2
Number of brothers	2.1	2.3
Child's household has its own sanitary toilet	51.7%	74.8%
Child's household has its own electricity	40.6%	52.1%
Child's household has its own fan	30.7%	46%
Child's household has its own TV	25%	42.1%
Child's household has its own radio	41.5%	67.5%
Child's household has its own table	78.8%	95.8%
Child's household has its own chair	78.3%	95.8%
Child's household has its own clock	80.1%	95%
Child's household has its own bike	34.8%	50.1%
Father's occupation: salaried/day labor	26%	28.2%
Father's occupation: self-employed/own business	22.3%	16.8%
Father's occupation: small business/petty trade	12.3%	10.7%
Father's occupation: home business	.6%	.8%
Father's occupation: cultivation	34.3%	34.4%
Father is unemployed	0%	.8%
Mother's occupation: salaried/day labor	3.4%	3.7%
Mother's occupation: self-employed/own business	.9%	.1%
Mother's occupation: small business/petty trade	.4%	.2%
Mother's occupation: home business	1.3%	.3%
Mother's occupation: cultivation	2.1%	1%
Mother is unemployed	91%	91.4%
Child lives less than 1 km from school	86.9%	65.8%

### Schooling Outcomes

Primary School Completion Examination Pass Rate	92.6%	
Secondary School Leaving Examination Pass Rate		39.5%

### Test Results

Correct Bengali reading	92.5%	69.2%
Correct English reading	40.3%	42.8%
Correct Bengali writing	91%	95%
Correct English writing	30%	59.8%
Correct addition	84.6%	76.4%
Correction multiplication	82%	60.4%

**Table A2. Bangladesh: Primary School Regression Variable Means**

***Teacher Characteristics***

Teacher absent	15.3%
Male	62.7%
Age	42.5
Hindu	22.1%
Born in this Area	67.2%
Head Master	22.9%
Years here	10.2
Number schools taught	3.3
No certification	8.2%
Higher Secondary School	28.4%
College graduate	28%
Post-graduate	8.9%
Never Attended Training	7.6%
Training<=6 months	30.4%
Training<=12 months	22.9%
Training<=3 years	13.1%
Does Private Tutoring	7.8%
Works in Agriculture	29.3%
Union member	55.7%
Vacation home	17.5%
Stays < 2km	56.2%

***School Characteristics***

% Female Students	51.2%
# Years established	57.4
Separate Toilets Female Students	46.4%
Drinking water	82.4%
Electricity	40.7%
Rural	69.2%
Municipality	18.3%
Road <=1 km	67.1%
Education Ministry <=5km	32.5%
Gov't health facility <=1km	23.2%
Private health <=5km	52.4%
Bus <=5km	65.1%
Train <=5km	20.7%
Bank <=5km	69.2%
Post office <=1km	37.7%

***Supervision Characteristics***

Inspection<=2 months	59.9%
Min of Edu never visit	83.3%
Visit Min of Edu <=2 months	96.4%
Staff meeting<=2 months	76.3%
SMC<=2 months	90.8%
PTA<=2 months	38.2%

***Supervision Characteristics as District Means***

Inspection<=2 months	59.3%
Min of Edu never visit	83.4%
Visit Min of Edu <=2 months	96.4%
Staff meeting<=2 months	75.4%

Table A2. Continued

SMC<=2 months	91.2%
PTA<=2 months	39.5%

***Student Family Background Characteristics***

Father has no education	27.9%
Mother has no education	28.7%
Father has no formal education	24.2%
Mother has no formal education	28.7%
Father's age	43.2
Mother's age	35.5
Parent-teacher meet<=1 month	56.1%
Pukka	7.9%
Tin Shad	28.8%
Toilet	55.9%
Fan	37%
TV	29.4%
Radio	43.2%
Chair	79.8%
Clock	81.4%
Bike	33.6%
Father's job: cultivation	28.8%
Child lives<=1km	86.2%

***Visit Factors***

Early morning	54.5%
Late morning	30.8%
Round 2	49.2
Monday interview	14.6%
Tuesday interview	16.3%
Wednesday interview	18.4%
Thursday interview	10.1%
Sunday interview	24.3%

***Division Effects***

Division: Barisal	9.7%
Division: Chittagong	20.6%
Division: Sylhet	7.2%
Division: Dhaka	26.1%
Division: Khulna	10.9%



**Table A3. Bangladesh: Secondary School Regression Variable Means**

***Teacher Characteristics***

Teacher is Absent	38.1%
Male	86.9%
Age	40.6
Hindu	25.4%
Born in this Area	62.7%
Head Master	9.3%
Assistant Head Master	7.8%
Teacher	22.6%
Years here	14.1
# Schools Taught	1.5
No certification	43.6%
Higher Secondary School	9.4%
College graduate	75.6%
Post-graduate	14.1%
Never Attended Training	33.8%
Training<=6 months	4.8%
Training<=12 months	3.4%
Training<=3 years	13.5%
Does Private Tutoring	17.2%
Works in Agriculture	39.6%
Union member	63.9%
Vacation home	23.1%
Stays < 2km	62.9%

***School Characteristics***

% Female Students	52.4%
# Years established	34
Separate toilets Female Students	80.4%
Drinking water	91.8%
Electricity	67.7%
Rural	76.9%
Municipality	15.1%
Road<=1 km	75.6%
Education Ministry <=5km	27.3%
Gov't health facility <=1km	31%
Private health <=5km	52.5%
Bus <=5km	72.9%
Train <=5km	20.5%
Bank <=5km	70.7%
Post office <=1km	53.9%

***Supervision Characteristics***

Inspection<=2 months	36.4%
Min of Edu never visit	40.4%
Visit Min of Edu <=2 months	90.3%
Staff meeting<=2 months	72.9%
SMC<=2 months	78%
PTA<=2 months	23.5%

***Supervision Characteristics as District Means***

Inspection<=2 months	35.5%
Visit Min of Edu <=2 months	89.8%
Staff meeting<=2 months	72.7%

Table A3. Continued

SMC<=2 months	78.7%
PTA<=2 months	22.6%

***Student Family Background Characteristics***

Father has >=HSC education	17.2%
Mother has >=HSC education	3.5%
Father's age	48.1
Mother's age	38.7
Parent-teacher meet<=1 month	46.9%
Pukka	14.6%
Tin Shad	30%
Toilet	77.2%
Fan	46.5%
TV	42.7%
Radio	69.1%
Chair	97.9%
Clock	97.1%
Bike	52.6%
Father's job: cultivation	35.2%
Child lives<=1km	66.8%

***Visit Factors***

March-April	18.6%
May	46%
Early morning	44.1%
Late morning	37%
Monday interview	18.4%
Tuesday interview	17.8%
Wednesday interview	10.8%
Thursday interview	8.5%
Sunday interview	21.3%

***Division Effects***

Division: Barisal	10.8%
Division: Chittagong	20.4%
Division: Sylhet	8.6%
Division: Dhaka	22.6%
Division: Khulna	12.5%

**Table A4. Bangladesh: Primary School Teacher Absence Regressions  
Results with District Average Supervision Variables**

Regression (1): Probit with dependent variable A taking on the values 0 = Present; 1 = Absent (note coefficients reported as marginal probabilities)

Regression (2): Random effects probit with dependent variable A taking on the values 0 = Present; 1 = Absent (note coefficients reported as marginal probabilities)

	(1)	(2)
<i>Teacher Characteristics</i>		
Male	0.042 (1.63)	0.309 (1.41)
Age	0.002 (1.09)	0.014 (0.92)
Hindu	-0.024 (0.94)	-0.176 (0.87)
Born in this Area	-0.008 (0.35)	-0.058 (0.31)
Head Master	-0.002 (0.08)	-0.014 (0.07)
Years here	-0.003 (2.06)*	-0.021 (1.70)^
Number Schools Taught	-0.019 (2.66)**	-0.130 (2.28)*
No certification	0.175 (3.48)**	0.799 (3.33)**
Higher Secondary School	0.008 (0.30)	0.054 (0.26)
College graduate	0.032 (1.04)	0.210 (0.86)
Post-graduate	0.054 (1.06)	0.313 (0.95)
Never Attended Training	0.056 (1.12)	0.321 (1.04)
Training<=6 months	0.033 (1.02)	0.215 (0.89)
Training<=12 months	0.042 (1.13)	0.267 (1.02)
Training<=3 years	0.038 (0.94)	0.233 (0.85)
Does Private Tutoring	-0.083 (3.03)**	-1.140 (2.86)**
Works in Agriculture	-0.043 (2.01)*	-0.328 (1.67)^
Union member	-0.023 (0.98)	-0.157 (0.87)
Vacation home	-0.070 (3.66)**	-0.656 (2.68)**
Stays < 2km	0.042 (1.98)*	0.301 (1.81)^

**Table A4. Continued*****School Characteristics***

% Female Students	0.001	0.009
	(0.75)	(0.76)
# Years established	-0.000	-0.003
	(0.84)	(0.81)
Separate toilets Female Students	-0.041	-0.287
	(1.70)^	(1.51)
Drinking water	0.000	0.001
	(0.01)	(0.01)
Electricity	-0.040	-0.287
	(1.45)	(1.25)
Rural	-0.040	-0.261
	(0.62)	(0.58)
Municipality	-0.052	-0.440
	(1.04)	(0.96)
Road <=1 km	-0.007	-0.050
	(0.27)	(0.25)
Education Ministry <=5km	0.025	0.167
	(0.79)	(0.69)
Gov't health facility <=1km	-0.014	-0.104
	(0.47)	(0.39)
Private health <=5km	0.019	0.133
	(0.71)	(0.62)
Bus <=5km	0.000	0.000
	(0.00)	(0.00)
Train <=5km	0.003	0.018
	(0.07)	(0.06)
Bank <=5km	-0.018	-0.124
	(0.53)	(0.47)
Post office <=1km	0.001	0.005
	(0.03)	(0.03)

***Supervision Characteristics (District Averages)***

Inspection<=2 months	-0.073	-0.507
	(0.95)	(0.83)
Min of Edu never visit	0.109	0.763
	(1.51)	(1.23)
Visit Min of Edu <=2 months	0.127	0.889
	(0.66)	(0.57)
Staff meeting<=2 months	0.014	0.095
	(0.21)	(0.21)
SMC<=2 months	0.085	0.594
	(0.99)	(0.91)
PTA<=2 months	0.093	0.649
	(1.27)	(1.08)

***Student Family Background Characteristics***

Father has no education	0.002	0.013
	(0.02)	(0.02)
Mother has no education	-0.063	-0.438
	(0.67)	(0.65)

**Table A4. Continued**

Father no formal education	0.037 (0.41)	0.257 (0.36)
Mother no formal education	-0.141 (1.45)	-0.980 (1.25)
Father's age	0.008 (1.29)	0.055 (1.14)
Mother's age	-0.009 (1.42)	-0.066 (1.31)
Parent-teacher meet≤1 month	-0.040 (0.83)	-0.276 (0.72)
Pukka	0.085 (0.55)	0.591 (0.48)
Tin Shad	0.027 (0.49)	0.187 (0.44)
Toilet	0.008 (0.18)	0.057 (0.18)
Fan	0.031 (0.31)	0.218 (0.27)
TV	-0.141 (1.02)	-0.986 (0.94)
Radio	-0.084 (1.09)	-0.584 (1.06)
Chair	0.110 (1.16)	0.766 (1.03)
Clock	0.022 (0.26)	0.156 (0.24)
Bike	0.130 (1.65)^	0.905 (1.80)^
Father's job: cultivation	-0.018 (0.30)	-0.124 (0.26)
Lives≤1km from school	-0.009 (0.12)	-0.060 (0.11)
<b><i>Visit Factors</i></b>		
Early morning	-0.004 (0.11)	-0.026 (0.10)
Late morning	-0.024 (0.79)	-0.176 (0.71)
Second round	0.013 (0.66)	0.092 (0.59)
Monday interview	-0.033 (0.97)	-0.263 (0.82)
Tuesday interview	0.025 (0.63)	0.163 (0.56)
Wednesday interview	0.002 (0.06)	0.016 (0.05)
Thursday interview	0.031 (0.68)	0.195 (0.63)
Sunday interview	0.022 (0.66)	0.146 (0.58)

**Table A4. Continued*****Division Effects***

Division: Barisal	-0.077 (1.99)*	-0.886 (1.63)
Division: Chittagong	-0.009 (0.16)	-0.066 (0.13)
Division: Sylhet	-0.033 (0.56)	-0.272 (0.55)
Division: Dhaka	-0.013 (0.28)	-0.092 (0.22)
Division: Khulna	-0.031 (0.57)	-0.251 (0.53)
Constant		-3.434 (1.39)
Observations	754	754
Number of id_teacher		409

Robust z statistics in parentheses

\* significant at 5%; \*\* significant at 1% ; ^ significant at 10%

**Table A5. Bangladesh: Secondary School Teacher Absence Regressions Results with District Average Supervision Variables**

Regression (1): Probit with dependent variable A taking on the values 0 = Present; 1 = Absent (note coefficients reported as marginal probabilities)

Regression (2): Random effects probit with dependent variable A taking on the values 0 = Present; 1 = Absent (note coefficients reported as marginal probabilities)

	(1)	(2)
<i><b>Teacher Characteristics</b></i>		
Male	0.015 (0.45)	0.082 (0.43)
Age	0.005 (2.11)*	0.024 (2.08)*
Hindu	0.016 (0.58)	0.081 (0.54)
Born in this Area	0.055 (2.27)*	0.300 (2.13)*
Head Master	0.064 (1.25)	0.292 (1.22)
Assistant Head Master	-0.022 (0.53)	-0.124 (0.50)
Teacher	-0.052 (1.45)	-0.300 (1.34)
Years here	-0.005 (2.44)*	-0.028 (2.33)*
Number schools taught	-0.082 (4.05)**	-0.431 (3.77)**
No certification	0.033 (1.36)	0.170 (1.28)
Higher Secondary School	0.094 (1.29)	-0.711 (1.20)
College graduate	-0.097 (0.83)	-0.443 (0.78)
Post-graduate	-0.089 (1.11)	-0.615 (1.05)
Never Attended Training	0.166 (4.89)**	0.752 (4.52)**
Training<=6 months	0.113 (1.61)	0.469 (1.60)
Training<=12 months	-0.051 (0.82)	-0.323 (0.74)
Training<=3 years	0.007 (0.19)	-0.036 (0.17)
Does Private Tutoring	-0.011 (0.37)	-0.061 (0.34)
Works in Agriculture	-0.044 (1.67)	-0.235 (1.60)
Union member	0.035 (1.19)	0.188 (1.12)
Vacation home	0.003 (0.10)	0.015 (0.09)

**Table A5. Continued**

Stays < 2km	-0.012 (0.55)	-0.064 (0.51)
<b><i>School Characteristics</i></b>		
% Female Students	-0.001 (1.06)	-0.004 (0.94)
# Years established	0.001 (0.56)	0.003 (0.56)
Separate toilets Female Students	0.009 (0.23)	0.048 (0.21)
Drinking water	-0.070 (1.18)	-0.315 (1.08)
Electricity	0.006 (0.16)	0.033 (0.16)
Rural	0.057 (0.74)	0.332 (0.70)
Municipality	-0.006 (0.07)	-0.033 (0.06)
Road <=1 km	-0.042 (0.97)	-0.206 (0.90)
Education Ministry <=5km	0.013 (0.36)	0.066 (0.30)
Gov't health facility <=1km	0.011 (0.29)	0.058 (0.28)
Private health <=5km	-0.056 (1.80)^	-0.289 (1.65)^
Bus <=5km	-0.071 (1.54)	-0.337 (1.46)
Train <=5km	0.128 (2.18)*	0.556 (2.01)*
Bank <=5km	0.038 (0.96)	0.207 (0.86)
Post office <=1km	0.004 (0.08)	0.019 (0.07)
<b><i>Supervision Characteristics</i></b>		
Inspection<=2 months	0.058 (1.02)	0.305 (0.82)
Min of Edu never visit	0.023 (0.47)	0.119 (0.44)
Visit Min of Edu <=2 months	0.031 (0.30)	0.164 (0.28)
Staff meeting<=2 months	-0.025 (0.44)	-0.133 (0.40)
SMC<=2 months	-0.006 (0.08)	-0.032 (0.08)
PTA<=2 months	-0.064 (0.88)	-0.338 (0.83)
<b><i>Student Family Background Characteristics</i></b>		
Father has >=HSC education	0.025 (0.24)	0.130 (0.22)



**Table A5. Continued**

Mother has >=HSC education	-0.559 (2.44)*	-2.929 (1.91)^
Father's age	0.004 (0.47)	0.019 (0.44)
Mother's age	0.003 (0.38)	0.018 (0.35)
Parent-teacher meet<=1 month	-0.051 (0.76)	-0.269 (0.70)
Pukka	0.021 (0.20)	0.111 (0.19)
Tin Shad	0.065 (1.05)	0.340 (0.97)
Toilet	-0.057 (0.97)	-0.297 (0.91)
Fan	-0.060 (0.74)	-0.317 (0.73)
TV	0.003 (0.03)	0.014 (0.03)
Radio	0.050 (0.69)	0.261 (0.64)
Chair	-0.133 (0.50)	-0.696 (0.44)
Clock	0.085 (0.40)	0.443 (0.38)
Bike	-0.042 (0.49)	-0.218 (0.49)
Father's job: cultivation	0.048 (0.68)	0.252 (0.63)
Child lives<=1km	-0.002 (0.03)	-0.012 (0.03)
<b><i>Visit Factors</i></b>		
March-April	0.165 (2.37)*	0.682 (2.05)*
May	0.093 (1.79)^	0.474 (1.61)
Early morning	-0.036 (0.83)	-0.192 (0.71)
Late morning	-0.030 (0.84)	-0.163 (0.77)
Monday interview	0.130 (2.20)*	0.557 (2.04)*
Tuesday interview	0.059 (1.14)	0.278 (1.06)
Wednesday interview	0.145 (1.91)	0.590 (1.64)
Thursday interview	0.195 (2.36)*	0.742 (2.30)*
Sunday interview	0.001 (0.01)	0.003 (0.01)

**Table A5. Continued*****Division Effects***

Division: Barisal	-0.099 (1.50)	-0.759 (1.54)
Division: Chittagong	-0.011 (0.16)	-0.060 (0.15)
Division: Sylhet	-0.013 (0.19)	-0.071 (0.17)
Division: Dhaka	-0.019 (0.34)	-0.101 (0.33)
Division: Khulna	-0.059 (0.96)	-0.369 (0.87)
Constant		-2.313 (0.92)
Observations	911	911
Number of id_teacher		911

Robust z statistics in parentheses

\* significant at 5%; \*\* significant at 1% ; ^ significant at 10%

**Table A6. Bangladesh: Primary School Student Regression Variable Means**

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***Test Results***

Correct Multiplication	84.4%
Correct Addition	86.3%
Correct writing English	30.5%
Correct reading English	40.9%

***Student Family Background Characteristics***

Father has no education	30.8%
Father has no formal education	25.3%
Father's age	43.3
Mother has no education	39.7%
Mother has no formal education	29%
Mother's age	35.4
Number of siblings	4
Boy student	47.1%
Child lives <= 1km	87.8%
Pukka	4.8%
Radio	40.6%
Chair	77.8%
Clock	80.8%
Bike	35.5%

***Teacher and School Characteristics***

Teacher is absent	16.1%
Student to teacher ratio	70.9%
% Female Students	51.1%
Parent-teacher meet<=1 month	59.4%
Separate toilets Female Students	41.5%
Drinking water	77%
Electricity	28.7%
Playground	76.7%
Fans	29.3%

***Community Characteristics***

Rural	76.9%
Municipality	14.8%
Division: Barisal	10.6%
Division: Chittagong	19.4%
Division: Sylhet	4.3%
Division: Dhaka	24.8%
Division: Khulna	13%

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**Table A7: Secondary School Student Regression Variable Means**

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***Test Results***

Correct Multiplication	62.6%
Correct Addition	78.1%
Correct writing English	61.4%
Correct reading English	44.4%

***Student Family Background Characteristics***

Father >=HSC education	16.7%
Mother >=HSC education	3.1%
Father's age	47.9
Mother's age	38.6
Number of siblings	4.4
Boy student	45.1%
Child lives <= 1km	67.3%
Pukka	13.5%
Radio	71.1%
Chair	98.6%
Clock	97.4%
Bike	54.2%

***Teacher and School Characteristics***

Teacher absent	16.8%
Student to Teacher Ratio	39.1%
% Female Students	51.8%
Parent-teacher meet<=1 month	48.2%
Separate toilets Female Students	79.2%
Drinking water	90.9%
Electricity	68.1%
Playground	97.7%
Fans	68.5%

***Location***

Rural	76.9%
Municipality	14.5%
Division: Barisal	10.8%
Division: Chittagong	20.1%
Division: Sylhet	6.9%
Division: Dhaka	23.2%
Division: Khulna	13.5%

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**Table A8. Secondary School Student Exam Pass Rate Variable Means**

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Percent Exams Passed	39.5%
Teacher is absent	17.6%
Separate toilets female students	79%
Electricity	65%
Student to teacher ratio	38.9%
% Female students	52.3%
Father has >=HSC education	17%
Mother has >=HSC education	3.4%
Child lives<=1km	66.1%
Rural	76%
Municipality	16%
Division: Barisal	10%
Division: Chittagong	20%
Division: Sylhet	8%
Division: Dhaka	24%
Division: Khulna	12%

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