

Education spending and equity in Bangladesh*

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March 2007

A background paper for the Bangladesh Poverty Assessment (2007)

South Asia Region

World Bank

* The author is very grateful to Farria Naeem of the World Bank in obtaining and compiling the expenditure data used and to the many government officials who kindly provided this data.

Abstract

Using conventional benefit incidence analysis this paper analyses the distribution of public education expenditure in Bangladesh in 2005. The paper shows that public recurrent education expenditure is not pro-poor. Even at the primary level 47% of total public recurrent spending goes to the poor whereas 50% of all primary school aged children are poor. The paper also explores spending patterns of the primary and secondary education stipend programmes. At the primary level, the paper shows that spending is only marginally pro-poor despite the programmes aim to target only poor households. At the secondary level the programme is largely focussed on the non-poor. While most public education spending is not pro-poor it is more equitable than the overall income distribution and therefore tends to reduce income inequality. Patterns of public education spending are largely driven by differences in participation rates between quintiles; poor households tend to have lower enrolment and completion rates at all levels of the education system and this is particularly true for poor boys. If the equity of public spending is to be improved a greater focus on increasing school completion rates amongst poor students is needed.

1. Introduction

In Bangladesh, increased investments in education are associated with higher returns in the labour market and higher productivity in the agriculture sector (Asadullah 2005; Asadullah and Rahman 2005; Al-Samarrai 2007a). Education is also associated with higher health status through an income effect as well as a direct effect from better knowledge and health practises. These impacts of education on livelihood outcomes for individuals and households result in a strong negative relationship between education and poverty in Bangladesh (World Bank 1998; World Bank and ADB 2003). More generally, micro level associations between education and poverty are mirrored at the macro level; good quality education is associated with faster economic growth (see for example, Hanushek and Kimko 2000).

In Bangladesh, education is seen to be a key component of the government's drive to accelerate poverty reduction (GOB 2005). The focus of current government policy is to improve education quality while maintaining and improving upon the impressive gains in access achieved during the 1990s. The government's strategy for accelerating poverty reduction also seeks to increase government spending on sectors that encourage pro-poor growth and therefore reduce poverty. In education, government's poverty reduction strategy focuses on improving access to and completion of basic education for the poor as well as improving the quality and skills of the work force more generally.

By using conventional benefit incidence analysis the paper analyses the distribution of public education expenditure from an equity perspective and aims to assess the extent to which this spending is pro-poor. Government education spending in Bangladesh includes spending on two important social safety net programmes that aim to protect disadvantaged groups' access and participation in education. In primary education, the primary stipends programme is designed to provide a stipend to poor students in rural schools while the secondary stipends scheme aims to provide eligible female students with tuition-free education as well as a small stipend. The paper aims to assess the extent to which the poor benefit from these schemes and in particular how effective poverty targeting on the primary scheme is.

The next section provides a brief description of the methodology and data used to undertake this analysis. It also provides a summary of the limitations of benefit incidence analysis and the use of the Household Income and Expenditure Survey (HIES) for this purpose. The following sections analyse the two main components of the incidence analysis: Section 3 explores educational participation from an equity perspective while Section 4 analyses variations in per-student spending across Bangladesh. Section 5 reports the papers findings on the distribution of public education spending and compares these with estimates calculated for Bangladesh in 2000, and with other countries within the region. Section 6 offers some conclusions.

2. Data and methodology

Benefit incidence analysis is a widely used technique to estimate the benefits from public spending and to determine the overall welfare impact of these benefits on different groups.¹ In this paper, the proportion of the overall benefit accruing to the j th group, I_j , is defined as:

$$I_j = \sum_{i=1}^n \frac{X_{ij}}{X_i} \frac{B_i}{B} = \sum_{i=1}^n x_{ij} b_i \quad [1]$$

where X_{ij} is the total number of beneficiaries in group j and in upazila (sub-district) i , X is the total number of beneficiaries, B_i is the benefit accruing to upazila i and B is the total benefit across all groups. The proportion of beneficiaries in group j in upazila i , x_{ij} , is calculated from household survey data while the share of total benefits accruing to upazila i , b_i , is obtained from government spending accounts. In most of the analysis conducted for this paper, benefits from public spending are equated with the average subsidy given to schools and are assigned only to users of these services.² The incidence analysis is estimated for the different levels of education as well as for total education spending.

Before summarising the data used for the analysis it is useful to describe some of the main limitations of incidence analysis. Equating average government subsidies to education with the benefit to the user is a particularly strong assumption given the levels of inefficiency that are common in education spending in Bangladesh (see for example, Al-Samarrai 2007b). In particular, differences in education quality not reflected in differences in levels of subsidy will not be incorporated into the analysis. The incidence analysis conducted in this paper provides a picture of the average distribution of public spending and therefore cannot be used to understand the distributional outcomes of marginal increases in public spending. These issues are not addressed in the paper and therefore the discussion of findings is careful to account for these limitations. Incidence analysis also does not analyse the overall level of per-student spending. For example, two countries may distribute a similar share of public spending to the poor even though per-student spending in one country is much higher than in the other. Clearly, the benefit of public education spending to the poor is much greater in the first country even though the incidence of spending is the same. To address this issue, the paper briefly explores how per-student spending on education in Bangladesh compares with other countries in the region and with countries at similar levels of development.

Data on educational participation and poverty status

Household expenditure per capita, computed from the HIES, is used to assign households into five equally sized quintiles and into poor and non-poor groups.³ Government spending on education is then divided between these quintiles according to the proportion of users that fall within each quintile. The number of potential students in each quintile is different owing to differences in the average number of children per household across quintiles.⁴ Approximately half of all primary school age children reside in households in the bottom 40% of the per capita expenditure distribution (see Table 1). The poorest 40% of the population also roughly coincides

with households defined as poor. Therefore, approximately half of all primary school age children live in poor households. Conversely, the proportion of post-primary school age children tends to be lower in poorer households and reflects the higher dependency ratios of poor households (see Table 1).

Table 1: School age population shares across quintiles and poor/non-poor groupings

	Age group	quintiles of household per capita expenditure					poor	non-poor
		1	2	3	4	5		
School age population								
Primary	6-10	27	23	20	17	14	50	50
Secondary	11-15	19	20	21	21	19	39	61
Higher secondary	16-17	14	17	21	23	24	31	69
Tertiary	18-25	15	18	20	23	24	33	67
Total	6-25	20	20	20	20	20	40	60
Students								
Primary	-	23	23	21	18	15	59	41
Secondary	-	10	13	20	26	31	55	45
Higher secondary	-	3	6	11	24	57	58	42
Tertiary	-	1	3	7	21	67	56	44
Total	-	16	18	20	21	25	34	66
Per capita expenditure	-	8	11	15	21	45	19	81
Household expenditure	-	9	12	16	21	42	21	79

Source: HIES 2005

Information on government education spending

It is possible to disaggregate information on public education spending to the upazila level for primary and secondary education and this information is used to calculate the incidence of public education spending. Calculations by education level are further complicated because there are two separate education ministries with some overlap in terms of responsibility for primary education. Appendix 1 provides a detailed description of the data and assumptions used to allocate government spending between the different education levels.

As the paper will show public spending per-student varies greatly depending on which type of publicly supported school a student attends (see Table 4). It is therefore important to account for these differences when the distribution of public education spending is estimated.⁵ Unfortunately, information on the type of school attended is only available in the HIES for individuals that report being literate and this excludes over half of all primary school students. The primary school students that have this information available are clustered in the higher grades of primary. As this paper will show, the poor are not as well represented in the higher grades of primary and therefore, basing the analysis only on students with information on the type of school they attend is likely to show a more pro-rich distribution than actually prevails.

An alternative approach is to ignore the type of school attended and allocate total primary education spending in each upazila using overall (i.e. not school specific) primary enrolment shares (x_{ij}) by quintile. Notwithstanding the large funding

differences across school types this approach ignores, it also fails to account for the significant proportion of primary school students that do not attend publicly subsidised schools. Approximately 11% of primary school students enrol in schools that are not subsidised by government with the largest number enrolled in NGO schools (DPE 2006a; World Bank 2006).⁶ Findings from other studies tend to show that primary school students attending NGO schools are from poorer households and therefore including these students as beneficiaries of government subsidies is likely to show a more pro-poor distribution than actually prevails (Hossain, Nath et al. 2005).

More generally, information on school type contained in the HIES is very different to that available in published census statistics.⁷ For example, national education data show that enrolment in government schools represents only 2.5% of total secondary (Class 6-10) enrolment whereas in the HIES enrolment in these schools is over 20% of the total (BANBEIS 2006a). The high proportion in the HIES seems unlikely given that there are only 317 government schools compared to over 20,000 non-government schools and madrasahs. It seems that there is some ambiguity on how households responded to this question (see Appendix 1). Because of these issues, incidence analysis for all levels of education are reported with and without the use of the school type variable.⁸ At the higher secondary and tertiary levels of education almost all students attend government or government subsidised schools. However, it is recognised that, particularly at primary, this does not fully address the issues outlined and therefore a cautious interpretation of the results is warranted.

Government subsidies per-student at the tertiary level are likely to vary enormously depending on the type of institution a student attends and the type of tertiary education pursued. However, information on both aspects of tertiary education are not well recorded either in the HIES or in public spending information.⁹ Furthermore, information on tertiary education expenditure is not generally available at the upazila level.¹⁰ Therefore, the paper assumes that the government subsidy per tertiary student is the same and hence the incidence analysis is solely driven by differences in enrolment across income groups. For these reasons, the discussion of tertiary education is dealt with only briefly in the paper.

The paper also analyses the incidence of stipend programme spending. Information on stipend programme expenditure is available from two sources; the HIES asks stipend holders how much they have received in stipend payments over the last year and information was also collected on stipend disbursements at the upazila level from the various project offices. Information from the HIES on stipends payments is preferred as this information accounts for differences in payments between individual stipend holders and is therefore more accurate. However, incidence analysis using the second source is reported in an appendix to the paper to aid comparison with the incidence of public recurrent expenditure which is calculated in the same way.

3. Education participation and equity

Primary and secondary enrolment rates in Bangladesh tend to be relatively low compared to developing country averages and compared with other South Asian countries (UNESCO 2006a). For example, only Pakistan with an overall primary enrolment rate of 82% had a lower enrolment rate in 2004 than Bangladesh (see Table

2 and UNESCO 2006a). How do enrolment rates vary between different income groups in Bangladesh? Table 2 reports gross enrolment rates for primary and secondary education for 2005. It is clear that poorer households have lower enrolment rates and the gap between rich and poor widens with the level of education. For example, the enrolment rate gap between the poorest and richest quintile is 22 percentage points at primary and 90 percentage points at higher secondary. The widening of the enrolment gap is explained by higher rates of drop-out from school amongst the poor. These are in turn caused by a combination of factors including the rising costs of education as students move up the system and lower levels of investment in education by poor households.

Table 2: Primary and secondary school gross enrolment rates, 2005 ¹¹

	Primary Classes 1-5			Secondary Classes 6-10			Higher secondary Classes 11-12		
	male	female	total	male	female	total	male	female	Total
Quintiles									
1	71	83	77	25	35	30	9	7	8
2	91	91	91	36	48	41	15	13	14
3	98	98	98	54	67	60	24	15	20
4	101	102	101	74	83	78	45	37	42
5	102	96	99	99	96	98	101	95	98
Poor	80	87	83	31	41	36	12	10	11
Non-poor	100	99	100	74	82	78	56	53	55
Rural	90	93	91	55	63	59	32	24	29
Urban	92	93	93	68	73	71	73	75	74
Total	90	93	92	58	66	62	42	39	41

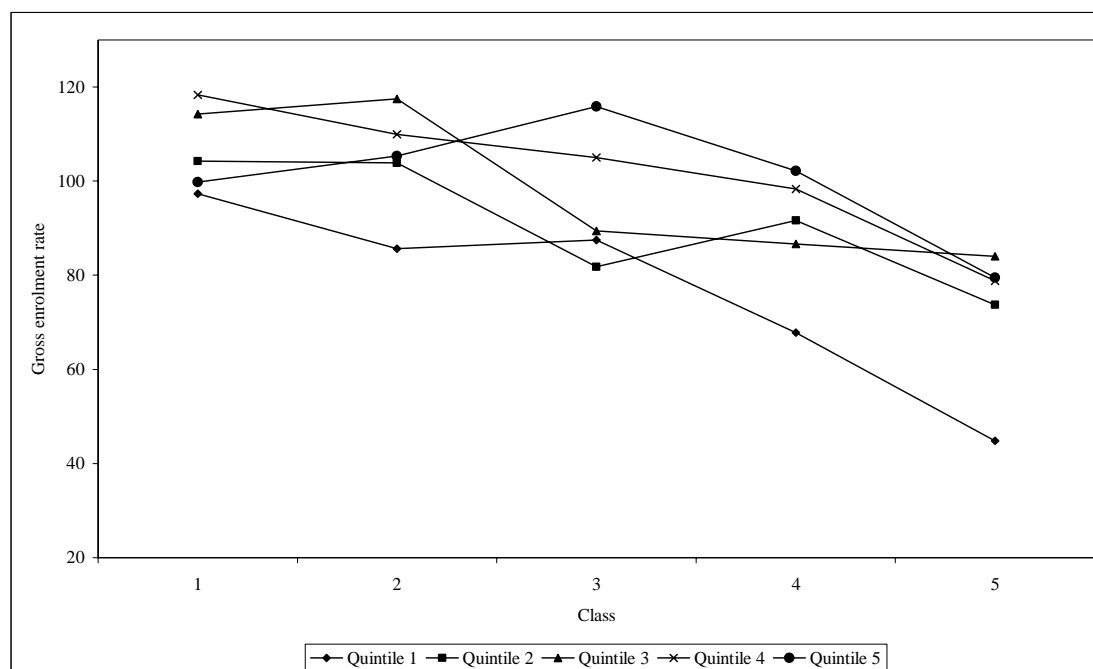
Source: HIES (2005)

Table 2 also shows that in primary and secondary education, enrolment rates are marginally higher for girls than boys. While gender parity in enrolment rates at these levels is not uncommon in other developing countries it is more unusual in South Asia. In 2004, no other country in the region had achieved gender parity in primary school enrolment rates and only the Maldives and Sri Lanka had achieved gender parity in lower secondary (UNESCO 2006a).¹² It is also striking that gender gaps in favour of girls are larger for poor households when compared with non-poor households. At primary, only the poorest 20% of households have higher female than male enrolment rates. Why do ultra-poor households send more of their daughters to primary school compared to their sons? In a study conducted in northern Bangladesh of extreme poverty it was found that ultra poor households depended heavily on the labour of their sons from an early age and this sometimes prevented them from going to school regularly or at all (BRAC and SCUK 2005).

The overall enrolment rates shown in Table 2 mark some very wide disparities in class-wise enrolment amongst the poor and non-poor (see Figure 1). Gross intake rates into grade 1 are relatively high for all quintiles; even for the poorest quintile the gross intake rate is 97%. Enrolment rates tend to decline as students progress through primary school because of drop-out regardless of which quintile the child belongs to.

The most striking aspect of Figure 1 is the very large drop in enrolment rates for the poorest quintile. Class 5 enrolment rates for the poorest are only 45% compared to 74-84% for the other quintiles. Gender differences are again greatest amongst the poorest; Class 5 enrolment rates for boys in the poorest quintile are 34% compared to 56% for girls. These findings suggest that drop-out is more common for the poorest students and particularly for boys which result in lower levels of primary school completion.

Figure 1: Class-wise primary gross enrolment rates, 2005



Source: HIES (2005)

At the secondary level a similar pattern of declining grade-wise enrolment rates also prevails. Proportional declines are much higher for poorer students compared to their richer counterparts; enrolment rates are 63% in Class 6 and 27% in Class 10 for the poorest quintile compared to 130% in both grades for the richest quintile (see Appendix Table 2.2).¹³ In contrast to primary however, male and female enrolment rate declines are similar in proportional terms.

Figure 1 can only be indicative of the proportion of children completing primary education because it ignores changes in promotion and drop-out rates over an individual child's primary school career. Table 3 looks at primary and secondary completion rates amongst those that have already passed the official school going age for each education level. For example, the official primary school going age group is 6 to 10 years old and therefore children aged 15 and over are unlikely to complete primary education if they have not already done so.

Completion rates amongst the age groups shown in Table 3 are strongly correlated with household consumption. This is particularly marked at the secondary level where completion rates for the richest quintile are nearly 8 times higher than for the poorest. While not strictly comparable, differences between current enrolment and completion are much larger for the poor compared to the non-poor. For example, the primary net

enrolment rate for the poor (rich) is 77% (99%) compared to a completion rate of 53% (89%) (see Table 2 and Table 3). This is indicative of higher drop-out amongst the poor in primary and secondary education.¹⁴

Table 3: School completion rates for 15-19 and 20-24 year old age groups, 2005

	% of 15-19 year olds who completed			% of 20-24 year olds who completed			% of 20-24 year olds who completed		
	primary			primary			secondary (6-10)		
	male	female	total	male	female	Total	male	female	total
Quintiles									
1	47	61	53	46	37	40	13	3	7
2	58	68	63	51	46	48	13	6	9
3	68	76	78	64	62	63	20	12	16
4	78	86	81	75	75	75	30	24	27
5	88	90	89	89	92	90	56	51	54
Poor	53	65	58	49	41	45	13	5	8
Non-poor	78	85	81	77	77	77	37	30	33
Rural	68	77	72	64	58	61	25	14	19
Urban	78	80	79	81	77	79	44	36	29
Total	70	78	74	69	64	66	30	21	25

Source: HIES (2005)

For the older age group (20-24) shown in Table 3 primary and secondary completion rates are higher for boys than girls. This is in contrast to enrolment where girls have higher rates than boys (see Table 2). For the younger cohort (15-19) primary completion rates for girls exceed boys suggesting that over time, female rates have been improving faster than male rates. This is no more evident than for the poorest quintile where female primary completion rates have improved by 24 percentage points between the two age groups compared to only 1 percentage point for boys (see Table 3). It is also striking that there has been substantial improvement in primary completion rates between the two age groups with the exception of boys in the poorest quintile whose completion rates have remained almost the same.

In 2005, the tertiary gross enrolment in Bangladesh was 6% and was relatively low compared to developing country averages (see Appendix Table 2.3). However, across South Asia enrolment rates in Bangladesh are comparatively high. For example, average tertiary gross enrolment rates in Nepal and Pakistan in 2004 were 6% and 3% respectively (see Appendix Table 2.3 and UNESCO 2006a). As students progress from secondary into higher secondary and tertiary education the gender gap widens; at tertiary there are approximately 2 male students for every one female student (see Appendix Table 2.3). Gender gaps at the tertiary level are higher in Bangladesh than they are on average in other developing countries and countries within the region. For example, the male enrolment rate in India at the tertiary level is 14% compared with a female rate of 9% (UNESCO 2006a). Tertiary enrolment is heavily concentrated amongst the richest quintile with two-thirds of the total students coming from this group (see Appendix Table 2.3). Very few students from poor households reach this stage. This is perhaps not surprising given the high costs of tertiary education and the

small proportion of poor students that successfully complete higher secondary education and are therefore able to proceed to tertiary education.

In summary, this section has shown that enrolment rates for both primary and secondary education are relatively low compared to other countries in the region. There are also substantial differences in enrolment rates between poor and non-poor groups. The gap between the poor and non-poor widens, particularly for the poorest 20% of the population, as students progress through the education system. This results in low primary and secondary school completion rates for the poor. Far fewer poor students are enrolled in tertiary education due to rising education costs as well as lower completion rates in earlier levels of education. Clearly differences in enrolment rates shown in this section will have an impact on the distribution of public education spending particularly at the pre-tertiary level where school provision is either provided by government or heavily subsidised.

4. Government and household education spending

Government education spending

The benefit to the poor from public spending on education will not only depend on the share they manage to secure but also on its level. For example, a more even distribution of public spending where spending per-student is high is preferable for the poor than a pro-poor distribution where per-student spending is low. Therefore, it is important to look at overall levels of per-student spending before analysing its distribution. Table 4 provides information on government per-student spending by provider. Average government per-student spending in primary and secondary education in 2005 was approximately \$20 and \$31 respectively.¹⁵ At the primary level, government per-student spending tends to be low compared to other countries in the region. For example, spending in India was approximately 3 times as high at this level in 2002. (Al-Samarrai 2007b). A similar pattern emerges at secondary and higher secondary with countries in the region, and at similar stages of development, spending much more than Bangladesh. At these low levels of spending it is perhaps not surprising that the Bangladesh education system is characterised by high drop-out and low completion rates.

It is clear that government subsidies per-student differ greatly between different education providers both at primary and secondary (see Table 4). Amongst the larger providers at primary, government and non-government registered madrasahs tend to receive the highest per-student subsidies from government. Registered non-government schools, that enrol over a fifth of all primary school students, receive less than half of the subsidy going to the other large providers. Given that primary schools are not allowed to charge tuition fees and are restricted in raising revenue from the local community, government subsidies tend to make up the bulk of funding at this level. Therefore, the differences shown in Table 4 represent overall differences in funding between the different providers of primary education. At the secondary level non-government schools and madrasahs provide almost all secondary school places and these schools are poorly funded relative to other school types. In fact these secondary schools receive a similar amount of support as government primary schools.¹⁶

Table 4: Revenue expenditure per-student in basic education (Tk.), 2005

	Primary		Secondary		Higher secondary	
	Tk.	%'ge of total students	Tk.	%'ge of total students	Tk.	%'ge of total students
	Government schools/colleges	1,497 (23)	58	5,568 (87)	2	4,748 (74)
Registered non-government schools	717 (11)	22	1,727 (27)	76	4,660 (72)	69
Government Alia madrasahs	-	-	7,536 (117)	0	7,536 (117)	0
Recognised non-government Alia madrasahs	1,969 (31)	7	1,969 (31)	18	1,969 (31)	13
Independent ebtedayee madrasahs	43 (1)	5	-	-	-	-
Community schools	198 (3)	3	-	-	-	-
Total (weighed average)	1,261 (20)	-	1,974 (31)	-	4,327 (67)	-

Sources: CGA data on recurrent expenditure for 2004/05 and 2005/06, BANBEIS (2006a) and DPE (2006a).

Notes: Recurrent spending is averaged over 2004/05 and 2005/06 to calculate the unit expenditures shown. Figures in parentheses are US dollar figures based on the average exchange rate in 2005 (IMF 2007). Percentage of primary school students each type of school enrolls does not add up to 100 because some schools (e.g. private unaided schools) are excluded. Percentage of secondary school students each type of school enrolls excludes Class 6-10 enrolment in colleges. Percentage of higher secondary school students excludes higher secondary students in technical, vocational and professional institutions.

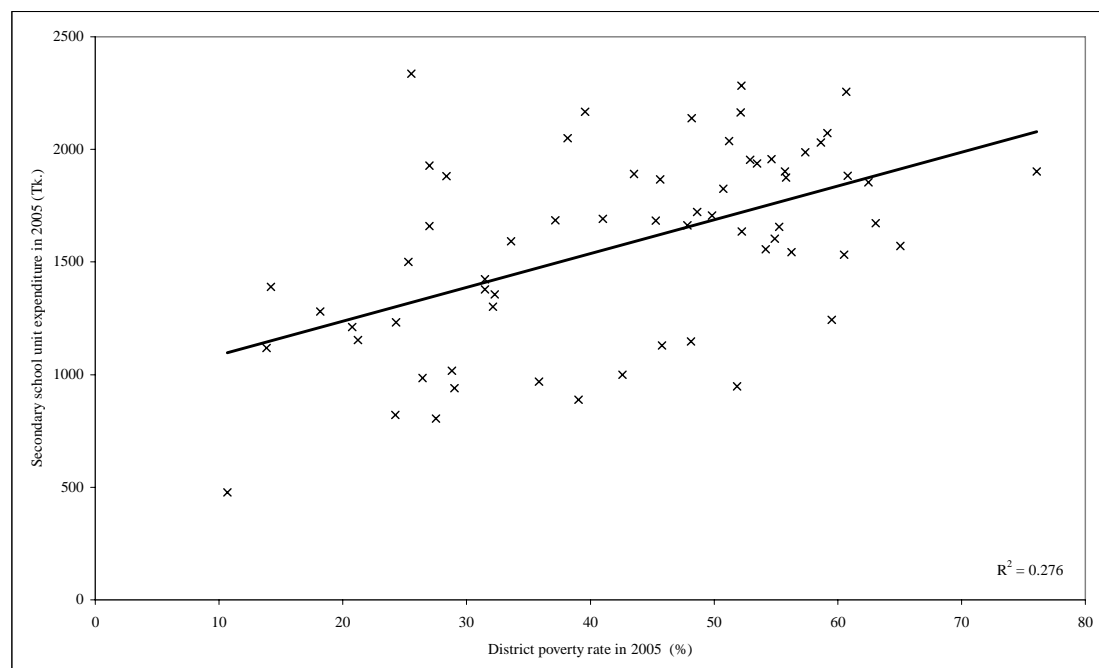
Differences in enrolment rates across consumption groups, discussed in Section 3, will to some extent drive differences in the incidence of public spending. The other factor that will determine the incidence of public spending is differences in government per-student spending between the poor and non-poor. Differences in per-student spending between groups may come about through rich and poor students attending different types of schools. As Table 4 has shown, government per-student spending is very different across different providers. If a greater proportion of poor primary school students, for example, attended registered non-government schools then the average government subsidy for a poor student would be lower than for the non-poor.

Do the rich and poor attend different types of school in Bangladesh? Surprisingly little is known about the socioeconomic status of students in different types of schools. It appears that there are no clear differences in the socioeconomic status of Class 5 students enrolling in different government aided primary schools (see Appendix Table 2.4). However, it is difficult to conclude that the socioeconomic composition of students in different types of primary schools is the same because nothing is known about the composition of students in the first 4 grades and the poorest frequently drop-out earlier.¹⁷ A greater proportion of the poor at the secondary level attend madrasahs compared to the non-poor. For example, 13% of poor Class 7-10 students attend registered non-government madrasahs compared to only 5% of the non-poor (see Appendix Table 2.4). Conversely, a greater proportion of the non-poor attend registered non-government secondary schools compared to the poor. However, levels of public spending per-student are similar in registered non-government schools and

madrasahs and therefore these differences are unlikely to alter significantly the distribution of public spending on education.

It may also be the case that government spending is lower in poor areas compared to richer areas. For example, teaching posts may be more easily filled in affluent urban areas compared to posts in poor rural areas. Subsequent differences in the number of teachers per school will have a significant impact on government per-student spending. It is important therefore to look at how government per-student funding varies across districts and how this correlates with poverty rates before combining this information with enrolment rate differences in the incidence analysis.

Figure 2: Scatter plot of government secondary expenditure per-student against district poverty rates, 2005¹⁸



Source: HIES (2005) and BANBEIS data

Notes: Spending per-student includes government and registered non-government secondary schools.

Figure 2 shows that there is a positive relationship between government per-student spending on secondary education and district poverty rates. However the association is weak and as Figure 2 shows there is a great deal of variation across districts in terms of government per-student spending. For government supported primary schools and madrasahs the association is positive but even weaker suggesting that resources are not being directed to poorer districts in any significant way.¹⁹

Household education spending

This section has shown that government per-student spending does not appear to be higher for richer students or in districts where the incidence of poverty is lower. How does this compare with private spending on education? Average household spending on primary is similar to levels of government spending (see Table 5). However, differences between poor and non-poor students are very high; households of non-poor students spend almost 4 times as much on their children's primary education

compared to poor households. A similar pattern emerges at secondary and higher secondary although levels of spending are much higher and household education expenditure tends to be much greater than government per-student spending. For example, government spends on average Tk. 4,327 for each higher secondary student whereas households spend over Tk. 10,000 (see Table 4 and Table 5).²⁰ The findings in this section suggest therefore that while government spending per-student appears to be relatively equal between poor and non-poor students, household spending is very unequal and leads to large differences in total per-student spending between poor and non-poor households.²¹ This is likely to result in different education outcomes for these groups and drive the differences in completion rates shown in the previous section between poor and non-poor students.

Table 5: Average annual household spending per-student (Tk.), 2005

	Primary	Secondary	Higher secondary	Tertiary
Quintiles				
1	420	1,734	2,972 ⁺	3,056 ⁺
2	624	2,215	3,055	5,561 ⁺
3	963	2,867	5,873	6,156
4	1,411	3,681	7,783	9,800
5	3,856	7,589	14,252	22,144
Poor	522	2,015	3,027	4,856 ⁺
Non-poor	1,923	5,039	11,281	18,225
Male	1,411	4,631	9,866	13,666
Female	1,174	4,098	11,187	24,462
Rural	785	3,177	7,355	12,467
Urban	3,163	7,583	14,060	21,853
Total	1,296 (20)	4,348 (68)	10,429 (162)	17,601 (273)

Source: HIES (2005)

Notes: ⁺ - denotes estimate was generated using fewer than 30 observations. Figures in parentheses are US dollar figures based on the average exchange rate in 2005 (IMF 2007).

This section has shown that overall levels of per-student spending in Bangladesh are low compared to other countries in the region and at similar levels of development. These low levels of spending need to be kept in mind when analysing the equity of public education spending. The discussion in this section has also suggested that government per-student spending does not appear to be higher for richer students or in districts where there is the incidence of poverty is lower. In fact the section has shown that there is a weak but positive relationship between district poverty rates and government per-student spending. However, there are substantial differences between poor and non-poor household spending on education and these are likely to drive in part, the very different education outcomes seen for these groups.

5. Distribution of education spending

This section combines information on enrolment patterns and public spending to analyse the incidence of public education spending across the income distribution. Previous poverty assessments have explored the incidence of public recurrent education spending and therefore it is possible to examine how it has changed over the last 10 years (World Bank 1998; World Bank and ADB 2003; Glinskaya 2005). A substantial component of the development budget in education is devoted to stipend programmes; in 2006/07 these amounted to 25% and 70% of the MoPME and MoE development budgets respectively. Given the importance of these programmes in overall government spending this section also explores how spending on these programmes is distributed across the income distribution.

Incidence of government recurrent education expenditure

In order to assess whether public education expenditure is pro-poor it is necessary to compare the proportion of public spending going to the poor with the proportion of the relevant population that is poor. Looking at overall education spending it is clear that the current distribution is not pro-poor; the poor represent 40% of the total population of school aged children but receive only 34% of total recurrent education expenditure. However, education spending is progressive in the sense that a greater proportion of it accrues to the poor compared to private household spending (see Table 1).

Table 6: Incidence of public recurrent education expenditure, 2005

	Primary	Secondary	Higher secondary	Tertiary	Total
Quintiles					
1	24	12	3	2	15
2	23	14	8	4	16
3	21	20	11	8	18
4	18	27	22	21	22
5	14	27	57	64	29
Poor	47	26	11	9	32
Non-poor	53	74	89	91	68
Male	52	49	61	66	53
Female	48	51	39	34	47
Rural	74	72	46	25	64
Urban	26	28	54	75	36

Source: HIES (2005)

Notes: All students, irrespective of whether they attend schools subsidised by government are used to compute the distribution of public spending in the table.

Primary education expenditure is clearly more focused on the poor than the other levels of education. However, even primary education expenditure is not pro-poor; 50% of the primary school age population is classified as poor (see Table 1) but the poor receive only 47% of public primary recurrent expenditure. This is a very similar finding to the incidence analysis conducted on the 2000 HIES data (Glinskaya

2005).²² The gap between the proportion of public spending going to the poor and the poor's share in the population grows as students progress from primary to tertiary education. For example, at higher secondary only 3% of public spending goes to the poorest quintile despite the poor representing 14% of the higher secondary school age population (see Table 1 and Table 6). Furthermore, at higher secondary and tertiary, public education spending is regressive since a smaller proportion of public spending accrues to the poor compared to private household spending (see Table 1 and Table 6). For example, only 9% of public tertiary spending accrues to the poor compared with 21% of household expenditure. Therefore subsidies at these levels tend to raise income inequality as they are more unequally distributed than household spending.

As Section 2 discussed, the incidence analysis presented in Table 6 does not account for differences in government expenditure by school type and fails to exclude students in schools that do not receive government subsidies. Appendix Table 2.6 reports the incidence analysis taking into account the distribution of students across different school types. Notwithstanding the limitations of the data described in Section 2, the patterns shown in Appendix Table 2.6 are similar to those reported in Table 6. The main difference is at the primary level where the percentage of public spending distributed to the poor is even lower than that shown in Table 6.²³ However, both methods show that even at this level, public education spending is not pro-poor.

Table 7: Trends in the incidence of public recurrent education expenditure

	Primary			Secondary and higher secondary			Tertiary			Total		
	1994	2000	2005	1994	2000	2005	1994	2000	2005	1994	2000	2005
Quintiles												
1	19	22	24	6	6	10	2	6	2	14	12	15
2	19	23	23	12	11	13	6	6	4	16	15	16
3	20	22	21	18	16	19	11	10	8	17	17	18
4	21	19	18	29	28	26	33	21	21	25	23	22
5	21	14	14	35	40	32	48	57	64	29	32	29

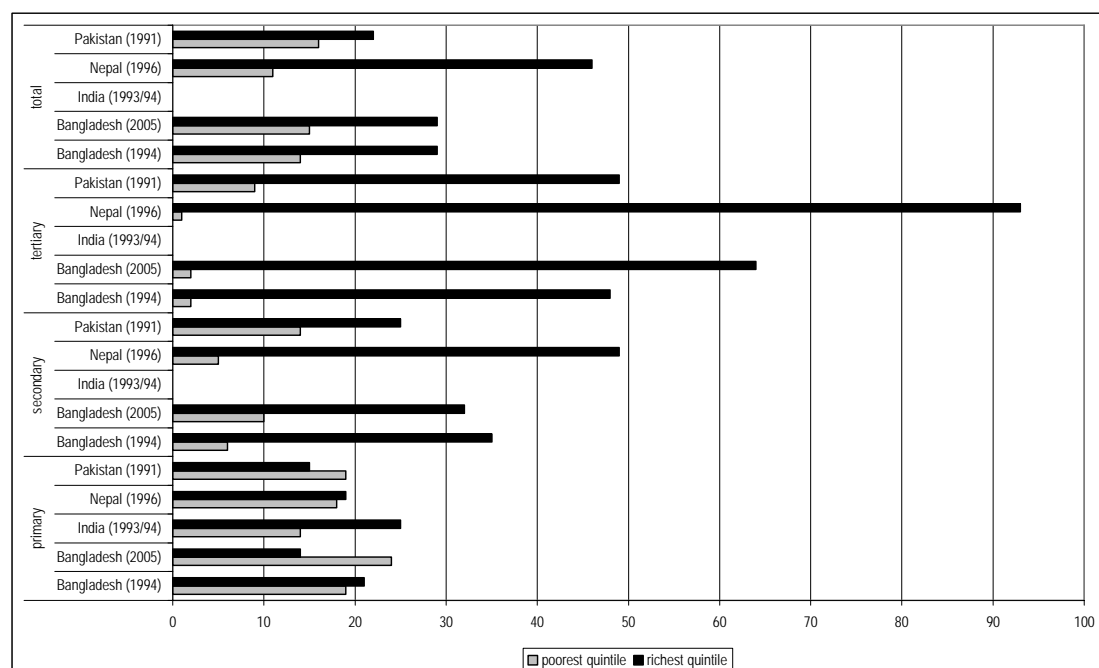
Source: HIES (2005), Glinskaya (2005) and World Bank (1998)

Notes: Previous studies did not differentiate between secondary and higher secondary education so these levels are combined in the table.

Over the last 10 years the largest shifts in public primary education spending towards the poor occurred in the first half of the period (see Table 7). Since 2000, there have been only very slight increases in the proportion going to the poorest 40% of the population. This in part reflects the stagnation in enrolment rates between 2000 and 2005; for the poorest 40% of households the primary gross enrolment rate only increased by one percentage point between 2000 and 2005. At the secondary level however, there does appear to have been a shift in public spending towards the poor since 2000. In 2000 17% of spending went to the poorest 40% of households compared to 23% in 2005. It does not appear that this trend was driven by a faster rate of enrolment growth amongst this groups.²⁴ It is possible that these increases have occurred because of the higher government spending per-student in poorer areas shown in the previous section (Figure 2). At tertiary there is some evidence that spending is becoming more pro-rich. However, given the very small size of the sector and the heterogeneity of the types of education included it is difficult to draw any firm conclusions from these trends.

How does the incidence of public spending on education in Bangladesh compare with other countries in the region? Figure 3 presents information on the incidence of public recurrent expenditure in other South Asian countries where this information was available. Most of the studies used data from the 1990s and therefore information on the incidence of public spending in Bangladesh for 1994 and 2005 is included for comparison. Figure 3 shows that the incidence of total education spending in Bangladesh is similar to the average across other South Asian countries; Pakistan has a more equal distribution with similar proportions of total education spending going to the richest and poorest quintiles whereas Nepal appears to have a less equal distribution. At the primary level, Bangladesh compares favourably with other countries in the region on the proportion of public spending going to the poorest quintile. However, in 1994 the share of public primary education spending going to the richest quintile was quite high compared to other countries. By 2005, this share was reduced considerably and is more comparable with patterns in other countries in the previous decade. It should be noted that there have been some marked changes in education since the 1990s in other South Asian countries and therefore the current incidence of public education expenditure may be very different to that shown in Figure 3.²⁵

Figure 3: Regional comparisons of the incidence of public education spending



Source: Davoodi *et al* (2003)

Notes: Nepal tertiary and total figures only include university and no other tertiary. Nepal and India quintiles calculated at the individual level whereas Pakistan is at the household level.

*Incidence of conditional cash transfer programmes in primary and secondary education*²⁶

Conditional cash transfer programmes have operated in the Bangladesh education sector since the mid 1980s with the introduction of a small stipend scheme for female secondary school students in 1982. Since then stipend schemes have been extended to all levels of pre-tertiary education although the objectives and characteristics of each scheme are different.

At the primary level the current stipend programme was introduced in 2003 although the project had two predecessors; the food for education (FFE) programme which began in 1993 and the primary education stipends project introduced in 2000 in areas outside of the FFE programme. The primary stipends programme is funded completely from government funds and is recorded on the development side of the government budget. The objectives of the current stipend programme are to improve student enrolment, attendance and completion rates, establish equity in financial assistance to primary school aged children and enhance the quality of primary education (DPE 2002). The programme covers up to 40% of rural students attending primary schools receiving government support.²⁷ Stipend card holders are supposed to be drawn from poor households.²⁸ The selection of stipend card holders is undertaken by school managing committees with approval from the *upazila* education and *nirbahi* officers. In 2005, approximately 4.6 million students participated in the primary stipends programme (DPE 2006b). To be eligible for a stipend payment the card holder must achieve a minimum score of 40% on the end-of-year examination. If this condition is met the annual stipend payment is based on the number of months an individual achieved an attendance rate above 85%.

For secondary education (Classes 6-10) the current stipend programme began in 1994 and is funded by the government and 3 development partners (ADB, NORAD and the World Bank). The government is the largest provider of stipends at this level operating in 270 of the 461 *upazilas* covered by the programme. The stipend programme aims to increase female access to secondary education, improve education quality and reduce fertility rates by delaying marriage. In 2005, 2.5 million female students were participating in the stipends programme.²⁹ Unlike primary, the secondary stipends programme provides tuition payments for eligible students to their schools in addition to a stipend. All unmarried female secondary school students are eligible to participate in the programme. To receive a stipend and tuition fee payment, girls must remain unmarried, obtain a minimum score of 45% in half-yearly examinations and have a school attendance rate of at least 75% (DSHE 2004).

Owing to issues outlined in Section 2 and Appendix 1 it is not possible to accurately identify students who attend schools that participate in the primary and secondary stipends programmes.³⁰ Therefore average participation rates reported in Table 8 will underestimate real programme participation.³¹ Assuming that students attending schools ineligible to participate in the stipend programme are distributed evenly over the income distribution, Table 8 shows that participation rates for poor students in the primary stipends programme are slightly higher than for their non-poor counterparts. Furthermore, 55% of all stipend holders are drawn from poor households whereas only 45% come from non-poor households. It is also interesting to note that girls have slightly higher participation rates than boys in the primary stipend programme. These

higher participation rates may be a reflection of the higher completion rates of girls in primary school and hence fewer female stipend card holders drop-out compared to boys.³²

Table 8: Stipend participation rates and incidence of programme expenditure, 2005

	quintiles					poor	non-poor	male	female
	1	2	3	4	5				
Stipend participation rates (% of all students attending eligible schools)									
Primary	28	27	26	20	12	27	21	22	26
Secondary	68	62	58	62	63	64	61	-	100
Stipend participation rates (% of all stipend holders in each group)									
Primary	28	27	24	15	6	55	45	47	53
Secondary	12	14	18	27	28	27	73	-	100
Per-student average annual stipend payment (Tk.)									
Primary	808	839	861	885	878	823	871	836	852
Secondary	428	449	501	509	589	439	537	-	510
Incidence of stipend project expenditure (%)									
Primary	27	27	24	16	6	54	46	46	54
Secondary	10	13	18	27	33	23	77	-	100

Source: HIES 2005

Notes: A wide definition of participation has been used which does not take account of the type of school that the individual attends and therefore overall participation rates will underestimate true programme participation.

The findings reported in Table 8 suggest that the primary stipends programme is poorly targeted because a large proportion of primary stipend recipients are not drawn from the poorest 40% of students. In a study of the FFE programme conducted by Galasso and Ravallion (2000) a targeting coefficient was calculated based on the 1995/96 HIES data. The targeting coefficient measured the difference between the fraction of poor students receiving stipends and the fraction of non-poor students that do. The targeting coefficient was calculated for the current primary stipends programme in the same way and the results show the stipends programme is not as well targeted as the former FFE programme. Given the FFEs more limited geographical coverage this is perhaps not surprising (Galasso and Ravallion 2000).³³

Fully assessing the targeting effectiveness of the primary stipends programme is difficult because of the way that students are selected. Apart from the exclusion of urban primary schools, targeting occurs at the school level and therefore it would not be expected that the poorest 40% of primary school students nationally would be selected for the programme. For example, the poorest 40% of students in a relatively affluent rural school may not contain any students defined as poor at the national level. These students would be eligible to participate in the programme even though they are not defined as poor by national standards. Therefore, information on the socioeconomic status of students in a sample of schools would be needed to fully assess the targeting of the primary stipend programme. However, it is possible, using the HIES to look at the effectiveness of targeting at the *mauza* level by ranking households in each sampled *mauza* by per capita expenditure and comparing stipend

participation rates between the poorest 40% of households in the *mauza* and other households. While this only goes some way to addressing the issue the results also suggest that the primary stipend programme is poorly targeted towards the poor.³⁴

At the secondary level, stipend programme participation rates amongst female students tend to be higher for the poorest quintile (see Table 8). Given that the secondary stipend programme is not poverty targeted this appears to be a strange finding. However, it is possible that it reflects the greater reliance of poor students on the stipend programme compared to their richer counterparts. Poor students are perhaps more likely to drop-out of secondary school if they fail to meet eligibility criteria compared to non-poor students who may stay on even if they do not receive benefits from the programme. While participation rates are high, three quarters of stipend holders at this level come from non-poor households. This reflects the lower enrolment rates of poor female students compared to their richer counterparts (see Table 2).

Have there been any large changes in the composition of stipend recipients since 2000? While the primary stipends programme had not begun at this time the secondary programme was operating and some limited information was collected in the HIES conducted in 2000. This information shows that there has been some improvement in access to the stipends programme for poor female students over the period. For example, 51% of female students in the poorest quintile participated in the programme in 2000 compared to 68% in 2005 (see Table 8 and Glinskaya (2005)). As a consequence the proportion of all stipend holders coming from the poorest quintile increased from 7% in 2000 to 12% in 2005.

The HIES collected information on the total payments received by stipend holders over the last year. The total annual stipend amount received will vary according to the student's fulfilment of the eligibility criteria over the previous year. It is interesting to note that the average annual stipend payment at primary is considerably higher than at secondary (see Table 8). Including the tuition payments made as part of the secondary stipends programme would not alter this; the maximum annual payment for tuition is Tk. 240 per year. These differences are at odds with the much higher costs associated with secondary as compared to primary school (see for example, Table 5). It is also the case that, at least for the poor, the primary stipend payment is well in excess of annual household per-student expenditure at this level. This suggests that a significant proportion of the primary stipend is used to cover the opportunity costs of sending children to school.³⁵

Table 8 shows that the annual amount received tends to be positively correlated with socioeconomic status. This is most marked at the secondary level where students in the richest quintile receive nearly 40% more than students in the poorest quintile. This is likely to reflect both richer students greater ability to fulfil the eligibility criteria and the larger proportion of richer students in higher grades where maximum stipend payments are higher.³⁶

Information on annual stipend payments can be used to look at the incidence of stipend programme spending.³⁷ At the primary level stipend payments per-student are similar across quintiles and therefore the incidence of stipend programme spending is similar to patterns of the composition of stipend holders across quintiles. The poor

receive 54% of all stipend payments. Given that approximately 50% of the total primary school age population is poor this implies that poor primary school aged children receive, as a whole, a slightly greater share of stipend resources than the non-poor (see Table 1). Therefore, unlike public recurrent primary education expenditure the primary stipends programme is pro-poor.³⁸ At the secondary level only 23% of stipend programme expenditure goes to the poor even though they make up nearly 40% of the secondary school age population (see Table 1 and Table 8). Therefore, the stipend programme at the secondary level is pro-rich. This finding is largely driven by the differences in enrolment and progression rates between the poor and non-poor at this level. The stipend programme however is mildly progressive since the share of stipend programme expenditure going to the poor is slightly higher than the share of total household expenditure.

6. Conclusions

The paper has shown that the incidence of public education expenditure is not, on the whole pro-poor. However, its distribution is more even than the distribution of household expenditure and therefore it tends to reduce income inequality. The distribution of government education spending is primarily driven by differences in enrolment rates between quintiles rather than large differences in levels of government per-student spending between the poor and non-poor. Put another way, public education spending is not pro-poor because poor households have lower enrolment and completion rates than richer households. Furthermore, differences in enrolment and completion rates increase as students move up the education system where government spending per-student is also much higher. Assuming that current government spending patterns on schools and districts remain the same, improvements in education participation and completion rates for the poor would result in a more equal and perhaps pro-poor distribution of public education spending.

While it was not the purpose of this paper to explore the reasons why enrolment and progression rates for poor children are worse than for non-poor children two issues were highlighted that are likely to contribute to these differences. Government spends relatively little per-student, compared to other countries, and this is likely to be a determinant of the poor quality of schooling seen in Bangladesh. Government spending per-student has increased rapidly since the beginning of the decade and this trend is likely to continue given current government policy and programmes (Al-Samarrai 2007b). However, it will be important that increased spending is concentrated towards inputs that improve the quality of education.

Low levels of government spending combine with household spending and result in wide differences in overall spending on poor and non-poor students. For example, at the primary level non-poor households spend nearly four times as much as poor households. Differences in household spending are largely explained by higher levels of spending on private tuition amongst non-poor households which in turn are likely to improve a student's chances of completion and progression.

The stipend programme at primary directed at the poor to encourage attendance and narrow overall spending differentials between poor and non-poor households has not been particularly well targeted; the share of primary stipend expenditure going to the

poor is only marginally higher than the percentage of school aged children that are poor. While targeting mechanisms on the programme are not designed to lead to a completely poverty focused programme the paper has argued that the share of programme expenditure going to the poor would be expected to be much higher. Clearly, targeting improvements are needed in the programme if the gap between education spending between the poor and non-poor is to be narrowed.

Participation rates in the secondary stipends programme are similar for poor and non-poor students. However, the paper has shown that enrolment in secondary is very strongly correlated with socioeconomic status and enrolment rates amongst poor households are very low. Therefore, while participation rates are similar almost three-quarters of stipend programme expenditure goes to the non-poor at this level. The paper has also shown that stipend payments are higher for non-poor female students and this reflects the higher proportion of non-poor students in the higher grades of secondary where stipend payments are higher. Improving progression and completion rates in secondary school for poor female students will be necessary if the gains in secondary access are to be translated into gains in education outcomes for this group.

The incidence analysis reported in the paper has limitations which centre around the ability of the HIES data to accurately identify the type of school students attend and which students receive government education subsidies. Incidence analysis appears to be an important output of the HIES reflected by its estimation in the last three rounds of the survey. Therefore adjustments to the questionnaire to allow the accurate recording of this information would greatly improve the quality of analysis. These adjustments are also likely to open up other areas of analysis which are of policy interest (e.g. household school choice decisions).

The paper has shown that at the primary level poor boys exhibit very low participation and completion rates. These low participation rates continue into secondary school where enrolment rates for poor boys are 10 percentage points lower than female enrolment rates. This in part reflects the success of the secondary stipend programme in attracting and retaining girls in the basic education system. However, given the large and growing gender gap in educational participation of the poor it will be increasingly important to understand more clearly the reasons for gender differences in participation and to develop policy responses.

Endnotes

- ¹ For a detailed description of the method, its limitations and a review of findings see Davoodi *et al* (2003) and Demery (2003).
- ² The stipend programmes analysed in the paper transfer cash to beneficiaries and assigning a monetary value as the benefit to an individual from the programme is not problematic.
- ³ The poverty line used to group households into poor and non-poor is the upper poverty line described in detail in BBS (2006).
- ⁴ It is possible to define quintiles at the individual level and only for the school age population. In this way each quintile would contain the same proportion of the school age population. This approach was not followed in this paper because it would require a separate set of quintiles for each school level and it was felt that this would hinder interpretation across levels. Furthermore, the approach followed in the paper was the same as the previous incidence analysis carried out in the HIES 2000 so trends in the distribution of public education expenditure can be more easily identified.
- ⁵ This is done by summing up the shares of public spending accruing to each group in each upazila and in each school type:

$$I_j = \sum_{k=1}^r \sum_{i=1}^n \frac{X_{ijk}}{X_i} \frac{B_{ik}}{B} = \sum_{k=1}^r \sum_{i=1}^n x_{ijk} b_{ik}$$

- where k denotes school type and all other definitions are the same as equation [1] in the text.
- ⁶ Schools that do not receive government funding are NGO primary schools (both formal and informal), private primary schools and unrecognised madrasahs and in particular *qwami* madrasahs.
 - ⁷ See Appendix 1 for a full discussion of the school type variable contained in the HIES.
 - ⁸ Only 2% of tertiary enrolment is recorded as being in institutions not subsidised by government. Therefore the incidence for tertiary is almost the same regardless of whether the school type variable is used or not.
 - ⁹ For example, first degree and masters courses are offered in both colleges and universities. Government per-student expenditure varies greatly across these two institutions; in government colleges the average per-student spending is Tk. 4,748 compared to Tk. 40,428 in public universities. It is not possible, using HIES data, to distinguish between students attending these two institutions.
 - ¹⁰ In particular, information is not available for public university and non-government college spending at the upazila level.
 - ¹¹ The gross enrolment rate is defined as total enrolment at a given level of schooling, irrespective of the age of the students, as a percentage of the population which, according to national regulations, is of an age to attend that level.
 - ¹² However, these countries had both achieved this at much higher levels of overall secondary enrolment.
 - ¹³ Gross enrolment rates in Class 10 are much higher than earlier grades in secondary (see Appendix Table 2.2). This may be driven in part by students re-entering schools at Class 10 to resit the SSC examination.
 - ¹⁴ This is also the case at the secondary level where the secondary net enrolment rate for the poorest (richest) quintile is 24% (68%) compared to a completion rate of 7% (54%).
 - ¹⁵ Per student spending in public universities is calculated to be Tk. 40,428 (\$629) in 2005.
 - ¹⁶ It should be noted that government subsidies remain a very important source of income for secondary schools even though at this level fess are charged. In a study conducted, in 2005 the government provided 60% and 70% of total school income for registered non-government schools and madrasahs respectively (CAMPE 2006).
 - ¹⁷ See Section 2 and Appendix 1 for a detailed discussion of why it is not possible to use the HIES to explore the socioeconomic status of students in these grades as well as concerns over the accuracy of the data.
 - ¹⁸ Unit expenditures in Figure 2 are slightly lower than those shown in Table 4 for government and registered non-government secondary schools. This is because unit expenditures in Table 4 are weighted by enrolment in each district and it seems that districts with higher secondary enrolment also tend to have higher unit expenditures. It is also the case that in order to calculate district level unit expenditures information from the monthly pay order for registered non-government schools

-
- was used. This information reports lower total expenditure on non-government schools. For further details see Appendix 1.
- ¹⁹ The correlation coefficient for the relationship between per student spending and district poverty rates is 0.11 and 0.25 for primary and madrasahs respectively.
- ²⁰ Average household spending on tertiary education (Tk. 17,601) is lower than government per-student spending in public universities (Tk. 40,428). However, tertiary education includes other types of education that are perhaps less well funded by government (e.g. technical and vocational education and degree courses in colleges). Therefore, it is difficult to draw any firm conclusions at this level.
- ²¹ Appendix Table 2.5 reports the incidence of household education expenditure.
- ²² In the previous study public primary education expenditure is classified as being pro-poor because a higher percentage of this spending went to the poor compared to the percentage of poor individuals in the overall population. However, the paper also reports the percentage of primary school age children that are poor. This shows that 59% of the primary school age population is poor and only 56% of primary education expenditure accrues to this group (Glinskaya 2005)
- ²³ This difference is the result of information on school type at the primary level only being available for those in the higher grades. A much greater proportion of Class 5 students are in the higher quintiles of household per capita expenditure compared with the overall distribution of primary school students.
- ²⁴ For example, the secondary enrolment rate for the poorest quintile increased from 20% to 30% and from 89% to 98% for the richest quintile between 2000 and 2005.
- ²⁵ For example, in India gross enrolment rates in primary increased from 98% in 1999 to 116% in 2004 which is likely to have changed the distribution of public spending from that shown in Figure 3 (UNESCO 2006b).
- ²⁶ Bangladesh also has a government funded stipend programme at higher secondary. However, this is not covered in this paper.
- ²⁷ It should be noted that primary school students in high schools and madrasahs supported by government are not eligible to participate in the stipend programme. Schools also have to fulfil a set of criteria to be eligible to participate in the stipends programme (see DPE 2006b).
- ²⁸ Poor households are defined in the project pro-forma as female-headed households, households of day labourers, households of insolvent professionals and households with less than 0.5 acres of land (DPE 2002).
- ²⁹ This information was provided by the four project offices for the purposes of the poverty assessment.
- ³⁰ An additional issue arises at the primary level because government aided independent ebtedayee madrasahs are included in the stipend programme while ebtedayee sections of government aided high madrasahs are excluded. It is not possible to differentiate students attending these two types of madrasahs using the HIES data.
- ³¹ Participation rates reported in Appendix Table 2.7 exclude students attending some schools that are not eligible to participate in the stipend programme. The participation rates reported are higher than those reported in Table 8. However, these figures are calculated using information available only for literate students which is particularly problematic for the primary stipends programme (see Section 2). Furthermore, it is not possible to exclude students in some schools that are ineligible for the stipends programme using information in the HIES. For example, primary students attending government supported high schools and madrasahs are not eligible for the stipend but cannot be excluded. These two groups of students represent 9% of total primary school enrolment. It is also not known with certainty whether students contained in the denominator attend eligible schools because some schools fail to fulfil the primary stipends school criteria and it is not known whether all students residing in rural (urban) areas attend rural (urban) schools.
- ³² Until the beginning of the 2005/06 financial year stipend cards could not be reassigned if a child dropped out of primary school. Since 2005/06 schools are able to reassign cards when students either transfer or drop-out of school.
- ³³ The targeting coefficient ranges between -1 and 1. If the programme is perfectly targeted towards the poor (non-poor) then the coefficient is equal to 1 (-1). If the coefficient is equal to zero then the programme is untargeted. The targeting coefficient in participating villages was 0.37 for the FFE programme (see Galasso and Ravallion 2000) compared to 0.10 for the primary stipends programme.
- ³⁴ The targeting coefficient estimated in this way is 0.08.
- ³⁵ On average primary students receive 70% of the maximum (Tk. 1200) amount available on the stipend programme. It is more difficult to assess the percentage of the maximum amount at

secondary since the stipend varies according to the Class. Including book and exam fee costs the stipend can range from Tk.300 at Class 6 to Tk. 1270 at Class 10.

³⁶ It is not possible with the data in the HIES to explore whether these differences are due to leakage.

³⁷ Appendix Table 2.7 presents incidence analysis based on upazila level stipend programme disbursement information collected from project offices. These estimates are more in line with the estimates of the incidence of public recurrent education expenditure. In addition, at the secondary level they also include both stipend and tuition payments. However, the incidence analysis is less accurate than the incidence analysis calculated from HIES payment data as it assumes each stipend holder receives the same payment.

³⁸ However, the poor represent 59% of children currently attending primary school and hence this suggests that the proportion of stipend resources going to poor students (54%) is smaller than their share in the student population (see Table 1).

Appendix 1: Detailed description of data used

This appendix outlines in detail the information that has been used to generate the incidence analysis reported in the paper. It also outlines the key issues and limitations of the data used.

Enrolment data

With the exception of Figure 2 all data on enrolment used in the paper was calculated from the 2005 round of the HIES. In undertaking the incidence analysis it is important to be able to differentiate between students attending government aided schools and students in private/unaided schools.

Appendix Table 1.1 compares information on the composition of school enrolment from the HIES and government education management information systems.

Appendix Table 1.1: Comparison of school ownership information from HIES and government education management information systems (%).

	Primary from HIES				Primary govern ment figures (2005)	Secondary from HIES		Secondary governme nt figures (2005)
	Class 1-5		Class 5		Class 1-5	Class 6-10		Class 6-10
	All attende es	valid	All attende es	Valid		All attende es	valid	
government	31	76	61	7	60	20	20	2
private (govt subsidised)	5	12	10	3	25	70	72	80
private (not subsidised)	2	4	2	3	3	1	1	0
NGO run institution	1	3	2	3	0	0	0	0
madrasah (govt affiliated)	1	3	4	4	13	6	6	18
madrasah (<i>kowmi</i>)	0	1	0	0	Not included	0	0	0
unknown missing information	1	-	3	-	-	1	-	-
unknown because illiterate	57	-	17	-	-	2	-	-
	100	100	100		100	100	100	100

Source: (BANBEIS 2006b; DPE 2006a)

Notes: For government figures on primary schools, government includes experimental schools, private (government subsidised) includes community school, private (not subsidised) includes kindergartens and non-registered primary schools. For government figures on secondary schools, madrasahs (govt affiliated) only includes Dakhil madrasahs. Total enrolment in higher madrasahs accounts for 35% of total madrasah enrolment and hence the figure here is likely to underestimate the total proportion of Class 6-10 enrolment in madrasahs. Enrolment in the 3 government madrasahs in Class 6-10 are also included.

In the HIES, information on the type of school attended is not known for over half of all students currently enrolled in primary school (see Appendix Table 1.1). This is because only students that are literate are asked about the type of school attended. Comparing HIES information with government information on primary schooling suggests that non-government schools and madrasahs are underrepresented in the HIES. These differences arise because a smaller proportion of students in these schools are literate and hence report their school type. At the secondary level the proportion of the sample claiming that they are in government secondary schools seems very high. There are only 317 government secondary schools compared to 18,000 non-government secondary schools. It is therefore unlikely that 20% of students at the secondary level are attending government schools.

Appendix Table 1.2: Type of school attended by grade (%)

	Primary grades					Secondary grades				
	1	2	3	4	5	6	7	8	9	10
government	68.1	71.1	75.6	79.5	76.6	62.1	7.3	7.8	8.9	6.5
private (govt subsidised)	15.9	12.8	12.4	10.3	12.7	30.2	84.5	85.0	84.5	84.8
private (not subsidised)	7.7	7.2	4.4	3.4	2.9	1.0	1.29	1.7	0.6	0.8
NGO run institution	5.5	4.0	3.4	2.9	2.89	1.21	0.06	0.1	0.3	0.3
madrasah (govt affiliated)	1.8	3.0	3.1	2.91	4.43	4.64	6.52	5.1	5.5	7.3
madrasah (<i>kowmi</i>)	1.0	1.9	1.1	0.75	0.45	0.86	0.36	0.2	0.2	0.3

Source: HIES 2005

The question for respondents in the HIES is slightly ambiguous as it is directed at household members who are currently enrolled in school as well as those that are not. The question is also asked before the enumerator knows whether the individual is currently attending school. It appears that households did sometimes provide information on the last school that the child attended rather than the current school. This is most notable in Class 6 secondary where over 60% of all students are recorded as attending government secondary schools (Appendix Table 1.2). However, looking at Class 7 only 7% report attending this type of school. It seems likely that some households who have children in Class 6 have given information on the primary school that these students attended rather than the current school. It is clear that a cautious interpretation of information from the HIES on the composition of school enrolment is warranted.

The school eligibility criteria for the stipend programmes analysed in the paper are also difficult to define using the HIES data for three reasons:

1. School type criteria. At the primary level, students attending high madrasahs and high schools are not eligible for the stipend programme. However, it is not possible to identify these students using the HIES data.
2. Rural/urban school location. At the secondary level schools in metropolitan areas are excluded from the programme. Metropolitan areas are not explicitly identified in the HIES and only make up a subset of urban areas. In order to exclude metropolitan areas, upazilas not covered by the stipend programme have been excluded.
3. It is not possible to accurately identify students that attend schools that participate in the stipends programme using the HIES data. For example, students may live in an urban area but attend a school in a rural area. It may

also be the case that a student attends a rural school but the school is ineligible to participate in the stipends programme.

Recurrent expenditure data

The expenditure data used for the incidence analysis is primarily drawn from three sources:

- CGA accounts data for public spending – This data records expenditure by ministry, functional unit and economic code. In general, information on recurrent spending is disaggregated to the level of upazila accounts offices. Therefore, it is possible to calculate education spending under various functional units by upazila. Grants to non-government schools, madrasahs and colleges enter the public accounts as a lump sum recorded under the CAOs expenditure code.¹ It is not possible therefore to calculate the amount of grant given to an individual upazila. Development spending is also recorded in the CGA accounts system although project aid (DPA) is excluded. In 2004/05 approximately 50% of the total development budget for MoPME was recorded in the CGA accounts. Furthermore, over 80% of this spending is recorded under the CAOs expenditure code and is not disaggregated by upazila even though it is spent across the country.
- Monthly Pay Order (MPO) information. The monthly pay order details the amount of grant each non-government institution receives. There are separate MPOs for the main types of institutions receiving grants namely, non-government primary schools, community schools, non-government secondary schools, non-government madrasahs, non-government colleges and ebtedayee madrasahs.
- Stipends programmes. Stipend programmes are part of the development side of the budget and therefore are poorly recorded in the CGA accounts (see above). However, given the importance of these programmes in the budget, information was collected on upazila level disbursements made by the various stipend programmes.² This disbursement information is for the stipend and tuition components of the programmes and does not include any administration expenditure.

Calculating government recurrent expenditure on different primary schools at the upazila level

Information on enrolment for 2005 is taken from the HIES and combined with expenditure information to undertake the incidence analysis. Government spending is generally reported by financial year and therefore spending in 2005 spans two financial years (i.e. 2004/05 and 2005/06). Expenditure in 2005 is estimated by averaging expenditure over the two financial years.

¹ There is a further issue with the CAO expenditure code. Expenditure for upazilas in Dhaka district that fall under the metropolitan area (e.g. Cantonment, Gulshan, Dhanmondi etc.) are also recorded under this code.

² In 2006/07, the primary stipends programme represented 25% of the total development budget for primary education. At secondary, stipend programmes accounted for approximately 70% of the Directorate of Secondary and Higher Education's (DSHE) development budget.

As the paper has pointed out public spending per student is very different across school types. It is therefore important to divide overall public spending on primary education at the upazila level according to school type. Appendix Table 1.3 outlines how primary education recurrent expenditure was assigned to different school types.

Appendix Table 1.3: Summary of information used to calculate upazila level primary recurrent expenditure by school type

School type	CGA functional unit	Comments
Government primary schools	2432	Government primary schools have their own functional code in the CGA accounts and it is therefore easy to identify overall upazila spending on government primary schools.
Registered non-government primary schools (RNGPS)	2405-3455-5903	Salary support. In 2004/05, 98% of all government recurrent support to RNGPS was for salaries. CGA accounts record total spending under this heading but this is not broken down by upazila. Information provided on the MPO for RNGPS was also not broken down by upazila. In order to estimate upazila level spending, average expenditure per RNGPS was calculated by dividing total CGA spending by the total number of RNGPS in Bangladesh. ¹ The number of RNGPS in each upazila were then multiplied by this average to give an estimated upazila level expenditure on RNGPS.
	2405-3455-5977	Other support to RNGPS. Expenditure on this item is combined with support to community schools and other initiatives (e.g. education week). This has been excluded from the calculations for upazila spending on RNGPS.
Community schools	2405-3983-5901	Information is available in the CGA accounts at the upazila level for spending on these schools. However, the HIES does not identify individuals attending these schools separately.
Ebtedayee madrasah students in High madrasahs	2540-0007-5931	Spending on these students falls under the MoE budget and is explained in the next section.
Independent ebtedayee madrasah students		Spending on these students falls under the MoE budget. However, it is not possible to separate out spending on these schools and therefore this spending is excluded. However, spending on these schools is very small; in 2004/05 grants to independent ebtedayee madrasahs represented less than 1% of total grants to madrasahs.

Notes: ¹ –Information on the total number of RNGPS in Bangladesh and by upazila were taken from DPE data for 2005.

There are some areas of the MoPME budget which have not been assigned to spending at the upazila level. These are:

- Secretariat (2401). This is mostly central level administration although it does include small repair grants given to schools across the country.
- Department of Primary Education (2432). This is mostly central level administration.
- Primary Training Institutes (2433). These are teacher training colleges and hence do not fall under spending on primary schooling.

- Upazila Education Offices (2434). These cover local level administration costs.
- Primary Education Implementation and Monitoring Cell (2440). This Cell is primarily responsible for maintaining the MPO and spending under this head represents administration.

This excluded expenditure represented 6% and 10% of total MoPME recurrent expenditure in 2004/05 and 2005/06 respectively.

Calculating government recurrent expenditure on different secondary schools at the upazila level

Calculating expenditure on government secondary schools and colleges

Government secondary schools have their own functional code (2436) in the CGA accounts and it is therefore easy to identify overall upazila spending on government secondary schools. All spending on government secondary schools is assumed to be spent at the secondary level (Class 6-10). While most government secondary schools have some primary grades no adjustment has been made for this in the calculations here.

Spending on government colleges also has its own functional code (2537) in the CGA accounts and this is broken down by upazila. Government colleges span higher secondary and post secondary levels of education.³ For the purposes of the incidence analysis it is necessary to divide total upazila college expenditure between higher secondary and post secondary. In the absence of upazila level information on college enrolment between these two levels national level data is used to allocate spending across the levels (see Appendix Table 1.4).

Appendix Table 1.4: Enrolment by education level in government colleges, 2005

Education level	Total enrolment	(%)
Secondary (Class 6-10)	-	-
Higher Secondary (Class 11-12)	277,916	54.6
College (Class 13 and above)	231,221	45.4
Total	509,137	100.0

Source: BANBEIS (2006)

Information on government spending on post-primary non-government schools and madrasahs.

Two sources of information are used to estimate upazila level spending on these types of institutions:

- CGA accounts. Information on government grants to post-primary non-government schools and madrasahs is not disaggregated between different types of institutions or across upazilas.

³ Government colleges do not have any secondary school students unlike non-government secondary schools.

- MPO. Information collected on the MPO reports total expenditure on post-primary government schools and madrasahs for each upazila. However, it is not disaggregated by the different types of institutions. The main types of institutions supported by government at this level are non-government colleges, non-government secondary schools, non-government madrasahs and ebtedayee madrasahs.

Two steps were taken to break down the available information into estimates of spending at the upazila level by school type.

1. Estimating expenditure per school/college and breaking down upazila spending by school type.

Looking at the MPO budget (functional code 2540) for 2004/05 and 2005/06 non-government colleges receive 23% of the total budget, non-government secondary schools 50% , non-government madrasahs 27% and ebtedayee madrasahs less than 1% of the total budget. Using these proportions and the number of schools/colleges in the different categories it was possible to estimate an average budget per school. This is reported in Appendix Table 1.5.

Appendix Table 1.5: Average budget per school for non-government institutions

School type	Number of schools on the MPO	Average budget per school in 04/05 and 05/06 (Tk.)	Budget per school as a ratio of non-government secondary school budget
Non-government college	2,075	2,713,088	3.33
Non-government secondary school	15,213	814,420	1.00
Non-government madrasah	7,021	970,206	1.19

Note: Information on the 2004/05 and 2005/06 budget is taken from ... Information on the number of schools of each type on the MPO is taken from the April 2004 MPO. Unfortunately this was the latest date information of this kind was available.

The MPO for each upazila is then broken down by school type using the number of MPO schools in each school category and the ratios of spending between the different school types (see Appendix Table 1.5).

2. Breaking down expenditure by school type into different education levels

Once upazila spending has been broken down by school type it was necessary to divide school spending between the different education levels. As per government norms all upazila spending on non-government secondary schools is allocated to secondary schooling (i.e. Class 6-10).

Non-government colleges span secondary, higher secondary and post secondary education levels. Appendix Table 1.6 reports the share of enrolment by education level in non-government colleges. These shares are used in each upazila to assign non-government college spending between the different education levels.

Appendix Table 1.6: Enrolment by education level in non-government colleges, 2005

Education level	Total enrolment	(%)
Secondary (Class 6-10)	365,008	29.8
Higher Secondary (Class 11-12)	634,903	51.9
College (Class 13 and above)	223,206	18.2
Total	1,223,117	100.0

Source: BANBEIS (2006)

Non-government madrasahs cover all levels of education and Appendix Table 1.7 reports the enrolment shares by education level. In a similar way to college spending these shares are used to assign madrasah spending across the education levels.

Appendix Table 1.7: Enrolment by education level in non-government madrasahs, 2005

Education level	Total enrolment	(%)
Primary (Class 1-5)	1,677,778	48.6
Secondary (Class 6-10)	1,597,219	46.3
Higher Secondary (Class 11-12)	120,014	3.5
College (Class 13 and above)	55,472	1.6
Total	3,450,483	100.0

Source: BANBEIS (2006)

Calculating government recurrent expenditure on tertiary education

Information contained in the HIES on the types of institutions that tertiary students are attending is limited. For those attending publicly supported institutions the HIES only contains information on whether they are attending; a) fully government funded institutions, b) non-government but MPO funded institutions, c) non-government madrasah but MPO funded institutions. It is not possible from the HIES to differentiate between tertiary students attending colleges, universities, teacher training colleges and technical and vocational colleges.

Over 65% of the public recurrent spending going to institutions offering post-secondary education comes through the University Grants Commission. CGA data on spending of the UGC only provides a total over the whole country and is not disaggregated to the upazila level.

Finally, in terms of the incidence analysis it is important to match students with the institutions that they are attending. Notwithstanding the identification of the type of institution that tertiary students are attending in the HIES it is also the case that household location is unlikely to identify the location of the institution that the student is attending.

For these reasons, no attempt has been made to disaggregate public tertiary education expenditure below the national level. The incidence analysis for this level is therefore driven completely by differences in enrolment between the quintiles and poor and non-poor groups.

The remaining part of this section details the components that make up government recurrent tertiary expenditure.

College spending

The estimated share of upazila level college spending (both government and non-government) going to post-secondary students (see previous section) is summed up to the national level.

Non-government madrasah spending

The estimated share of upazila non-government madrasah spending going to post-secondary students (see previous section) is summed up to the national level.

Technical education

Spending under functional units 2552, 2553, 2554 and 2555 are included in overall tertiary expenditure.

University spending

Apart from colleges (see above), universities also provide tertiary education. Government funding of public universities is through the University Grants Commission (UGC) by way of a grant to each institution (functional code 2561). Information on these grants is not disaggregated to the district or upazila level in the CGA accounts.

There are some areas of the MoE budget which have not been included in the incidence analysis. These are:

- Administration (2501, 2505, 2506, 2531, 2551). This is mostly central level administration although it does include some expenditure on computers and laboratory equipment that is distributed to schools across the country.
- Teacher training colleges (2535). The HIES does not include information on whether individuals are enrolled in these colleges so they have been excluded from the analysis (see above).
- Government madrasahs (2538). There are 3 government madrasahs and expenditure on these institutions have been excluded from the analysis since the HIES does not differentiate between government and non-government (MPO) madrasahs.
- Commercial institutes (2539).
- Other education institutions (2571, 2573, 2577, 2579). This mostly includes spending on supporting agencies to the post-primary education sector and does not include much spending at the institution level. However, the Directorate of Education Engineering (2571) includes spending on repairs and maintenance of post-primary institutions.

This excluded expenditure represented 7% and 8% of total MoE recurrent expenditure in 2004/05 and 2005/06 respectively.

Summary

Appendix Table 1.8 provides a summary of the actual spending reported in CGA accounts and the estimates generated by the assumptions described in this section.

Appendix Table 1.8: Actual and estimated total government recurrent budget by school type and level (Tk. millions)

School type	2004/05	2005/06	Number of upazilas included	Total estimated annual spending (2004/05 – 2005/06)
Ministry of Primary and Mass Education				
Government primary schools	12,767	15,697	472	14,200
Registered non-government primary schools	(2,109)	(2,668)	472	2,547
Ministry of Education				
Government secondary schools	1,156	1,373	179	1,235
Registered non-government secondary schools	(10,754)	(13,979)	443	9,768
Registered non-government madrasahs	(5,878)	(7,680)	443	5,487
Primary (1-5)			443	2,595
Secondary (6-10)			443	2,606
Higher secondary (11-12)			443	198
Post-secondary (13+)			443	87
Registered non-government colleges	(4,937)	(6,439)	443	4,285
Secondary (6-10)			443	1,277
Higher secondary (11-12)			443	2,224
Post-secondary (13+)			443	780
Sub –total (non-government institutions)	21,888	28,102	443	19,540
Government colleges	2,134	2,707	150	2,416
Higher secondary (11-12)			150	1,319
Post-secondary (13+)			150	1,097
TOTAL	39,735	50,543		39,938
TOTAL (MoE+MoPME)	50,814	62,603		
% of total education budget	78	81		

Notes: Figures in parentheses are budgeted figures whereas other figures are actual expenditures. There are 472 upazilas in the CGA data. This is slightly below the total number of upazilas in the country because for CGA accounts upazilas in some metropolitan areas (e.g. Dhaka) do not have their own accounts office. Estimates for MoE spending on non-government institutions required information on the number of schools of each type in each upazila. This information was not available for all upazilas and is why the estimates do not cover all the 472 upazilas in the CGA data and also why the estimates are low compared to the CGA totals and budget totals.

Stipends expenditure data

Two sources of information are used to calculate the incidence of stipend spending:

1. Disbursement information collected from project offices.
2. Information on actual receipt of stipend payments for sampled households in the HIES.

The Government of Bangladesh stipends project is the largest provider of stipends at the secondary level. Unfortunately, no disbursement information was available for the second disbursement (July-December) of 2005 and therefore the allotment for this period was used.

For the secondary stipend programme information from project offices includes all stipend, tuition and other types of payments. The information collected from sampled households in the HIES only collects information on stipend payments.

Appendix 2: Supplementary tables

Appendix Table 2.1: Net enrolment rates

	Primary			Secondary			Higher secondary		
	male	female	total	male	female	total	male	female	total
Quintiles									
1	55	62	58	17	30	24	2	3	2
2	64	65	65	27	39	33	3	3	3
3	71	73	72	37	49	43	4	5	4
4	74	77	76	52	64	58	11	6	9
5	81	79	80	65	71	68	18	23	20
Poor	59	63	61	22	34	28	2	3	3
Non-poor	75	76	75	51	62	56	11	12	12
Rural	66	69	67	38	49	43	6	6	6
urban	71	73	72	47	56	52	15	18	16
Total	67	70	68	40	51	45	8	9	9

Source: HIES (2005)

Appendix Table 2.2: Grade wise gross enrolment rates in secondary and higher secondary, 2005

	Secondary					Higher secondary	
	6	7	8	9	10	11	12
Quintiles							
1	63	22	29	18	27	10	5
2	68	32	42	29	39	18	8
3	103	49	48	50	66	25	14
4	119	59	75	68	84	48	33
5	133	68	77	82	139	98	98
Poor	66	27	36	24	33	14	6
Non-poor	118	58	67	66	97	58	50
Total	94	44	55	51	75	44	37

Source: HIES (2005)

Appendix Table 2.3: Tertiary enrolment rates, 2005

	Gross enrolment rates			Net enrolment rates		
	male	female	total	male	female	total
Quintiles						
1	1	0	0	1	0	0
2	2	0	1	2	0	1
3	3	1	2	3	1	2
4	7	3	5	6	3	5
5	18	13	16	17	12	15
Poor	2	0	1	2	0	1
Non-poor	10	6	8	9	6	7
Rural	5	2	4	5	2	3
urban	14	8	11	12	8	10
Total	7	4	6	7	4	5

Source: HIES (2005)

Appendix Table 2.4: Enrolment by school type, 2005

	School type						Total
	Govt.	Private aided	Private unaided	NGO	Madrasah aided	Madrasah unaided	
Class 5 enrolment							
Quintiles							
1	79	7	2	5	6	2	100
2	76	14	1	4	5	0	100
3	79	9	4	3	4	1	100
4	82	10	3	2	4	0	100
5	67	23	5	1	5	0	100
Poor	77	11	1	4	5	1	100
Non-poor	76	14	4	2	4	0	100
Rural	79	11	2	3	5	1	100
Urban	69	19	6	3	3	0	100
Total	77	13	3	3	4	0	100
Class 7-10 (secondary) enrolment							
Quintiles							
1	8	77	1	1	14	0	100
2	8	77	1	0	12	1	100
3	5	88	0	0	6	0	100
4	7	87	1	0	6	0	100
5	9	86	2	0	3	0	100
Poor	8	77	1	0	13	1	100
Non-poor	7	87	1	0	5	0	100
Rural	5	86	1	0	8	0	100
Urban	13	82	2	0	3	0	100
Total	8	85	1	0	6	0	100

Source: HIES(2005)

Appendix Table 2.5: Incidence of household education spending, 2005

	Primary	Secondary	Higher secondary	Tertiary
Quintiles				
1	7	4	1	0
2	11	7	2	1
3	15	13	7	2
4	20	23	18	11
5	47	54	72	86
Poor	18	11	3	1
Non-poor	82	89	97	99
Male	56	50	55	48
Female	44	50	45	52
Rural	33	40	28	23
Urban	67	60	72	77

Source: HIES (2005)

Appendix Table 2.6: Incidence of public recurrent education expenditure accounting for the type of schools individual's attend.

	Primary	Secondary	Higher secondary	Tertiary	Total
Quintiles					
1	20	10	3	2	12
2	20	13	6	4	14
3	21	21	10	8	18
4	21	27	24	21	24
5	18	28	56	64	33
Poor	40	24	9	9	26
Non-poor	60	76	91	91	74
Male	51	48	56	66	53
Female	49	52	44	34	47
Rural	68	71	42	25	60
Urban	32	29	58	75	40

Source: HIES (2005)

Notes: Only students attending schools subsidised by government are used to compute the incidence reported here. Differences in expenditure across school types in each upazila are also accounted for in the table.

Appendix Table 2.7: Stipend participation rates and incidence of programme expenditure using alternative information, 2005

	quintiles					poor	non-poor	male	female
	1	2	3	4	5				
Stipend participation rates (% of all students attending eligible schools)									
Primary	37	35	34	24	14	36	25	28	33
Secondary	69	63	57	63	63	66	61	-	100
Stipend participation rates (% of all stipend holders in each group)									
Primary	28	27	24	15	6	55	45	45	55
Secondary	12	14	18	27	28	27	73	-	100
Incidence of stipend project expenditure using narrow definition of participation (%)									
Primary	32	28	21	13	5	60	40	56	44
Secondary	12	14	16	29	29	26	74	100	0
Incidence of stipend project expenditure using wide definition of participation (%)									
Primary	30	26	24	16	5	56	44	53	47
Secondary	12	14	16	28	30	26	74	100	0

Source: HIES 2005

Notes: For participation rates, a narrow definition of participation has been used which takes account of the type of school that the individual attends (see endnote 31 for further details). The reported incidence analysis is calculated using information on upazila disbursements (obtained from stipend project offices) and participation rates from the HIES. These differ from those in the main text because they assume the same payment per participating student.

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