School Drop Out in Bangladesh:
New Insights from Longitudinal Evidence

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Consortium for Research on
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List of Acronyms

BRAC	Building Resources Across the Community
COMSS	Community and School Studies
CREATE	Consortium for Research on Educational Access, Transitions and Equity
EFA	Education for All
EPDC	Education Policy and Data Centre
GBP	Great Britain Pound
GOB	Government of Bangladesh
IED-BRACU	Institute of Educational Development-BRAC University
LRT	Likelihood Ratio Test
UN	United Nations
UPE	Universal Primary Education

Acknowledgements

Preface

This paper offers a unique and important insight into patterns of drop out amongst a large scale sample of children from six districts across Bangladesh. Data collected in 2007 and 2009 is used to track the characteristics of those who never enroll, those who enroll and drop out, and those who are enrolled in both periods. Clear differences emerge between the groups some of which are individual level, some school level and some related to households. The findings suggest a range of possible interventions that have some potential to reduce drop out and the numbers who never enrol and those who enrol late**.** Growing numbers of drop outs, substantial amounts of migration, and multiple of deprivation paint a challenging picture of what needs to be done to realise ambitions for full enrolment. It should be possible to continue tracking this cohort in future to establish whether the patterns identify persist.

This analysis is one of several being conducted on the data set that has been collected. Others will focus on equity and age in grade and other matters of concern for improved educational access.

Keith Lewin
Director of CREATE
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Summary

This paper examines factors associated with school drop out using longitudinal data collected over a three year period in Bangladesh. A sample of 9,047 children, aged 4 to 15, were selected by the CREATE Bangladesh research team across six districts for a specialised household survey developed in technical workshops. The survey was developed by CREATE through workshops in Sussex and Bangladesh and was based on a framework developed by Keith Lewin and Angela Little. The survey instruments were modified to suit the Bangladesh context and were first administered in 2007. The same cohort of children was followed up and resurveyed two years later in 2009.

Children aged 6 to 15 were selected since all these children should have been in school or have completed primary education in the first round of the survey. Four groups of children were identified: (i) those who were enrolled in school in both 2007 and 2009, (ii) those who dropped out by 2009, (iii) those who were not enrolled in 2007 but were in 2009 and (iv) those excluded from education in both 2007 and 2009.

First, children who dropped out were compared with those who remained in education. Those who dropped out were on average older, had repeated more school grades, came from lower income families, had parents with lower levels of education, had more household responsibilities, and significantly received less support from parents for their school work.

Second those who were not enrolled in 2007 but were in 2009 were similar in household characteristics to drop outs. These children were becoming progressively over age between 2007 and 2009 and it is likely that the factors that discouraged enrolment in 2007 persisted into 2009. Poverty, low levels of parental education, and unskilled parental occupations are factors related to late entry into education of these children and these are also factors related to drop out of those who do enrol. Children who start school late are more at risk of dropping out than those enrolled at the appropriate age.

Third, the characteristics of children who remained permanently excluded from education between 2007 and 2009 were and compared with children who enrolled but dropped out from school. Children who were permanently excluded from education were more likely to be disabled and less likely to play normally than children who dropped out. These excluded children were poorer, both economically and educationally, than families of children who dropped out.

This study identifies some possible interventions that could reduce educational exclusion. These include campaigns to reduce late entry and overage enrolment caused by repetition of grades; reductions in direct costs to households of attendance, more support for low achieving children or compensate for lack of educational support at household level, and interventions designed to lessen the impact of disabilities on enrolment and attendance.

School Drop Out in Bangladesh: New Insights from Longitudinal Evidence

1. Introduction

Effective policies to improve school progression and reduce the numbers of children dropping out of school are critical if Universal Primary Education (UPE) is to be achieved. Although children are starting primary school in greater numbers than ever before, the rate at which children drop out from school remains high in many low income countries where over half of the children who start primary school do not complete the full cycle of education (Lewin and Sabates, 2011). In Bangladesh although entry into Grade 1 has reached near universal levels the primary school completion rate has remained around 60 percent since 2000 (World Bank, 2009). Repetition and drop out remain substantial problems.

There are many factors associated with the process of dropping out from school. Some of these factors belong to the individual or child, such as poor health, under-nutrition or lack of motivation to learn (Hunt, 2008). Others emerge from children's household situations such as child labour, migration and poverty. School level factors also play a role in increasing pressures to drop out such as teacher absenteeism, school location and poor quality educational provision (Alexander, 2008). The system of educational provision at the community level generates conditions that can ultimately have an impact on the likelihood of children dropping out from school. Both demand and supply driven factors, embedded in cultural and contextual realities, impact on the process of dropping out from school.

Most empirical evidence on drop out from large scale surveys is based on information collected at one point in time. Children who are in school are compared with those who were once in school but who at the time of the survey were not enrolled in order to investigate the possible causes of school drop out. This approach has two shortcomings. First, most observable factors are measured after children have dropped out from school, and are only able to provide post facto explanations of drop out. Second, this approach fails to recognise that drop out is often a complex process which may include sequences of inter related events (Lewin, 2007; Hunt, 2008). Thus the process of dropping out from school needs to be studied over time and be related to a number of possible determinants in order to understand its dynamics.

This paper explores the factors associated with school drop out using longitudinal data collected over a three year period in Bangladesh. A sample of 9,047 children, aged 4 to 15, were selected by the CREATE Bangladesh research team from six districts for a specialised household survey developed and pretested in technical workshops. The survey instruments were developed in workshops in Sussex University based on a framework developed by Keith Lewin and Angela Little. It was then developed and pre-tested by the Bangladesh CREATE team. The survey was first administered in 2007. The same cohort of children was followed up and resurveyed two years later in 2009. Children aged 6 to 15 were selected since all these children should have been in school or have completed primary education in the first round of the survey. Four groups of children were identified: (i) those who were enrolled in school in both 2007 and 2009, (ii) those who dropped out by 2009, (iii) those who were not enrolled in 2007 but were in 2009 and (iv) those excluded from education in both 2007 and 2009. The longitudinal nature of the data enables us to investigate patterns of school drop out and 'drop in' (out of school children who return to school) over time.

The analysis takes a close look at children's situation at home and in school and the relationship between the home and the school in order to bring new evidence of the reasons why children are dropping out. Do children who drop out from school receive less support from teachers and parents than children who remained in education? Do children who drop out have more substantial household chores than children who remained in education? Are they older? Are they more likely to be sick or have disabilities, etc? We also examine the income poverty which is often cited as a cause of drop out. Rather than only associating family income at one point in time with drop out, we investigate whether both the magnitude and changes in the financial situation of the household is related to decisions to leave education. This analysis also provides some insight into the role of fluctuations in income as a determinant of school drop out.

Our paper has strong foundations in the CREATE model of educational access (Lewin, 2007). In particular, this paper compares children who have dropped out from education (Zone 3) with those who have never been enrolled (Zone 1) and in this sense remained permanently excluded from educational opportunities. In addition, we also identify children who start or re-enter education after the official age of entry into primary school and compare them with children who drop out. Although children who start or re-enter education late may be considered a net gain towards achieving UPE, it is probable that these children these children are more likely to drop out and may be "silently excluded" (Lewin, 2009) and leaning little. Without additional support these children are likely to remain at risk of not completing a full cycle of primary and lower secondary education.

This paper is structured as follows. Section 2 reviews the background literature on school drop out, drawing on the work of CREATE and especially Hunt (2008) with the addition of recent material on Bangladesh. Section 3 describes the methods, data and estimation, to be used for the analyses, which are presented in Section 4. Results are divided according to whether children were in education, dropped out, entered education after 2007, or were excluded from education in 2007 and 2009. Since the focus of this paper is on drop out, all the results are discussed relative to the group of children who drop out. The paper ends with a discussion of the main findings and the implications for policy.

2. Background Literature

There are many factors associated with drop out, some of which are associated with the individual, such as poor health or under-nutrition and children's school motivation. Others emerge from children's household situations such as child labour and poverty. School level factors also play a role in increasing pressures to drop out such as teacher's absenteeism, school location and poor quality educational provision. The nature of educational provision at the community level e.g. type of school, level of community support) generates conditions that can ultimately have an impact on the likelihood of children dropping out from school. Both demand and supply driven factors play a role in the process of school drop out.

In this section, we review studies on the causes of school drop out focusing on the child within the household and school contexts. This review is informed by the work commissioned by CREATE by Hunt (2008) and Pridmore ((2007). We discuss evidence on the child's health, gender and disability; the child within the household; the cost of schooling; household characteristics; precursors to drop out; and recent studies from Bangladesh.

2.1 The child – health, gender and disability

Personal characteristics of a child, influenced by social norms can determine whether the child drop out from education. Some studies explore associations between child health and educational outcomes, in particular how nutritional status impacts on school enrolment and cognitive development (Ghuman et al, 2006; Alderman et al, 2001) but only a few studies look at how health problems are directly related to dropping out from school (Pridmore, 2007). In general, studies suggest that poor health is often a result of poverty and through under-nutrition, children's educational access and attainment are severely jeopardised. Thus there is evidence that haemoglobin levels in the blood, and height and weight (body mass for age), are both indicators of nutritional status, and have significant and positive associations with school enrolment (Alderman et al, 2001; Ghuman et al, 2006). In addition, early child under-nutrition is associated with delayed school enrolment (Glewwe and Jacoby, 1995). In Bangladesh nutrition deficiencies are associated with slow school progress due to its impact on children's cognitive development (Grira, 2001).

The patterns and process of school drop out are likely to be substantially different for boys and girls. Different social norms, values, beliefs, traditions and practices have strong discriminatory elements mitigating against girl's educational persistence and performance (Colclough et al, 2000) and in many areas drop out from education is disproportionately experienced by girls (Bandyopadhyay and Subrahmanian, 2008; Hossain, 2010b) though there are an increasing number of locations where boys drop out more frequently, especially where there are income earning opportunities. In addition, there may be a gendered dimension of intra-household resource allocation. This may imply a reduced willingness to support girls' education when resources are insufficient to cover all children, or when costs increase (Nekatibeb, 2002).

Reproductive health problems and teenage pregnancy push girls out of school in many countries. Several studies have shown that pregnancy is a major cause of dropout of girls from school (Dunne and Leach, 2005; Grant and Hallman, 2006; Cardoso and Verner, 2007). As well as pregnancy, early marriage, child slavery, child fostering, trafficking, and multiple household duties for girls are some of the reasons behind the higher likelihood that girls

leave the educational system before boys in societies where their rights are not secured and where social norms undervalue girls' education (Vavrus, 2002; Tuwor and Antoinette, 2008). As suggested by Brock and Cammish (1997):

> The onset of puberty is an important factor in its effect on girls' education. We have seen that it increases vulnerability and may therefore make parents decide to withdraw their daughters from school. Distance to school, the lack of female teachers, poor or non-existent toilet facilities and the necessity to board away from home can be factors contributing to such a decision at this age (Brock and Cammish, 1997:47).

Finally, disabilities are another important factor that may contribute to school drop out. A major issue with disability is that many children in low income countries who suffer from a physical or psychological impediment are denied access to education (Peters, 2003). When disabled children do have access to education, their chances of completion of a full cycle are severely limited due to the unavailability of resources, specially trained teachers and clear school policy guidelines regarding disabled children (Peters, 2003). In Bangladesh, for example, children with disabilities are less likely to start school and if they do, their overall school attainment and possibilities for transition into lower secondary schooling remain very low (Filmer, 2005). Birdsall et al. (2005) claim that only around five percent of the world's children who have some form of disability complete primary schooling; many never enrol or dropout very early. Disability, therefore, remains an important issue to be tackled both in terms of access to school and progression through to successful completion of basic education.

2.2 The child within the household

The family context, in particular the relationship of the child with other members of the household and the child's responsibilities may be important determinants of school drop out (Rose and Al-Samarrai, 2001; Khanam, 2008). In many poor countries children combine school with work (at home or away from home) in order to satisfy household needs (Admassie, 2003).

However, not all forms of child labour are compatible with school participation (Hadley, 2010). Some labour activities, especially in agriculture, are seasonal and the timing of seasons do not correspond to the school calendar (Hadley, 2010). Other activities, such as child care for younger members in the household, are labour intensive and time consuming and may detract from children's ability to undertake school work (Dar et al, 2002).

Another important aspect of the life of children within the household is the relationship with their parents, in particular the support given by parents with the child's schooling and the perceptions of parents about the potential benefits of education for their children (Ananga, 2011 forthcoming). It is likely that parental support for the child's education is linked to lower chances that the child will drop out from schooling. Not all parents are engaged with their children's education. A study by Liu (2004) in China found that the majority of parents were indifferent about their children dropping out from school and left the schooling decision to the child, particularly for older children. Liu (2004) suggested that parents do not want to be blamed by the child for not continuing in education, particularly at junior secondary level.

2.3 Cost of schooling

The direct and indirect costs of schooling can exclude some children from school. One of the most important direct costs underlying the process of drop out is school fees where these are levied. Thus school fees were found to be a potent reason for drop out of 27 percent of boys and 30 percent of girls before matriculation in South Africa (Hunter and May, 2002). Many countries have now adopted fee free for the basic education cycle because of the effects on participation. Some have also introduced capitation systems to offset the loss in school income. But other charges and indirect costs continue to be an obstacle to enrolment of the poorest households (Lewin, 2008).

Thus the costs of pens/pencils, copybooks, private coaching, transportation, and school uniform remain a relative economic burden for poor households (Ananga, 2011 forthcoming). Lack of money to buy essential school materials for children's schooling is likely to cause lack of enrolment in the first place and potentially high dropout at a later stage (Kadzamira and Rose, 2003). This is the case in Kenya, where dropout rates among the children of economically vulnerable families have gone up due to lack of resources to pay for the costs of education for their children that are not covered by the fee free educational policy (Mukudi, 2004). The 'cost-sharing' policy of Kenya compelled parents to pay about 65 percent of school costs, which caused many poor children to drop out (Ackers et al, 2001).

The opportunity cost of schooling is the income forgone of the next best activity available for children who are in education. These activities relate to child labour or caring responsibilities both within and outside of the household (see Section 2.2 above). The opportunity cost for children who are in schooling often increases as they get older, which increases the pressure on them to withdraw from school (Colclough et al, 2000). In Bangalore, India, for example, if the wage earnings of parents are low children may be called to supplement household income either by working or by taking on other household responsibilities to free up other household members for work (Chugh, 2004). This is likely to increase the risk that children drop out from education.

2.4 Household characteristics

Several studies have focused on income and dropout. Most of these studies are undertaken at a macro-level. A UN taskforce report on education and gender equality on low and middle income countries shows that completion rates are lowest for children from poor households and less than half of the poorest children complete even the first year of school (Birdsall et al, 2005). At a micro-level, family income is directly linked to the affordability of education and as such has a direct impact on whether children attend education (Hadley, 2010). If children do attend education, changes in the financial situation of parents, as reflected by the volatility of family income, may push some children out of education. Although this may be a temporary effect and income may recover and return to schooling (Kane, 2004; Hadley, 2010).

Another important factor that is often related to drop out is parental education level (Chowdhury et al, 2002; Nath et al, 2008). Parents with low levels of education are more likely to have children who do not attend school. If they do, they tend to drop out in greater numbers (Blick and Sahn, 2000; Brown and Park, 2002) and engage in more income generating activities than children of parents with high levels of education (Duryea, 2003; Ersado, 2005). A recent case study of a rural village in Ghana showed parental illiteracy was

associated with low household income as two important factors likely to cause girls to drop out (Pryor and Ampiah, 2003). Furthermore, there may be some gendered dimensions to the links between parental education and children's drop out with differential effects for boys and girls (Connelly and Zheng, 2003). For girls, the risk of becoming pregnant, and hence potentially dropping out of school, declines significantly as the educational attainment of the household head increases (Grant and Hallman, 2006).

Finally, children whose parents/siblings fall ill might be expected to be caregivers for these sick relatives, at times causing them to miss or drop out of school. This is especially the case for girls (Case and Ardington, 2006; Kane, 2004). A study of adolescents in South Africa shows that household members who had experienced illness in the last three months were associated with a higher likelihood of dropping out from school for boys than for girls (Hunter and May, 2002). A study of HIV/AIDS affected families in Kenya show children's reduced chances of completing school from the affected families (Akunga et al, 2000).

2.5 Precursors to drop out

The process of dropping out from school may have precursors. CREATE has hypothesised that these are likely to include the child not attending school regularly, low achievement, grade repetition, and late enrolment (Lewin, 2007). These precursors or signs that the child is likely to drop out and are different from school level factors that are associated with the decision to drop out from school, such as school quality, safety or relationship with teachers (Tikly and Barrett, 2010). The latter are not included in this brief review but have been discussed by Hunt (2008).

Grade repetition and late enrolment cause the child to be over the age-in-grade appropriate. Over age entry and progression delays primary school completion to ages where boys and girls may be subject to growing pressure to contribute to household income and to enter into marriage (Lewin, 2007). Roderick (1994) shows that in the U.S. children who repeat grades (from kindergarten to Grade 6) are significantly more prone to drop out even after controlling for difference in background characteristics. As explained above, older children have higher opportunity cost of schooling which is linked to the probability of drop out. Similarly, older girls face issues of school safety, teenage pregnancy and marriage which are associated with dropping out from school, and this is particularly important in low enrolment countries.

Although it is expected that children with low achievement are more likely than those with higher achievement to drop out, empirical evidence is scarce (Boyle et al, 2002; Hunter and May, 2002). Evidence from rural South Africa has shown that children who were enrolled in Grade 2 and had low achievement, were less likely to complete Grade 7 than children who had high achievement (Liddell and Rae, 2001). Each additional standard deviation scored in Grade 2 exams resulted in children being 4.8 times as likely to reach Grade 7 without repeating a year of schooling.

According to Hunt (2008) irregular attendance and temporary withdrawals can be caused by a range of factors including: child ill health; ill health of family members; distance to school; labour requirements; pending school fees. As a result of irregular attendance or temporary withdrawal, children can fall behind at school and find it difficult to readjust on returning.

2.6 School Drop Out in Bangladesh

High repetition and dropout rates are two barriers to universalising access to primary education in Bangladesh. The levels of these two indicators are the main reasons behind Bangladesh being 'off-track' to achieve the completion of universal primary education by 2021 (National Audit Office, 2010). A document produced by the Bangladesh government shows a 55 percent survival rate to the final grade of elementary school in 2008 (53 percent boys and 57 percent girls), which means that 45 percent of children who enter in Grade 1 are likely to drop out without completing primary school (GoB, 2009). Government information shows the dropout rates at primary level have been falling slowly, from around 60 percent in 1991 to 48 percent in 2004 as described in Figure 1. The decline is far too slow to allow universal completion by 2015.

Figure 1: Dropout rate by year: Bangladesh
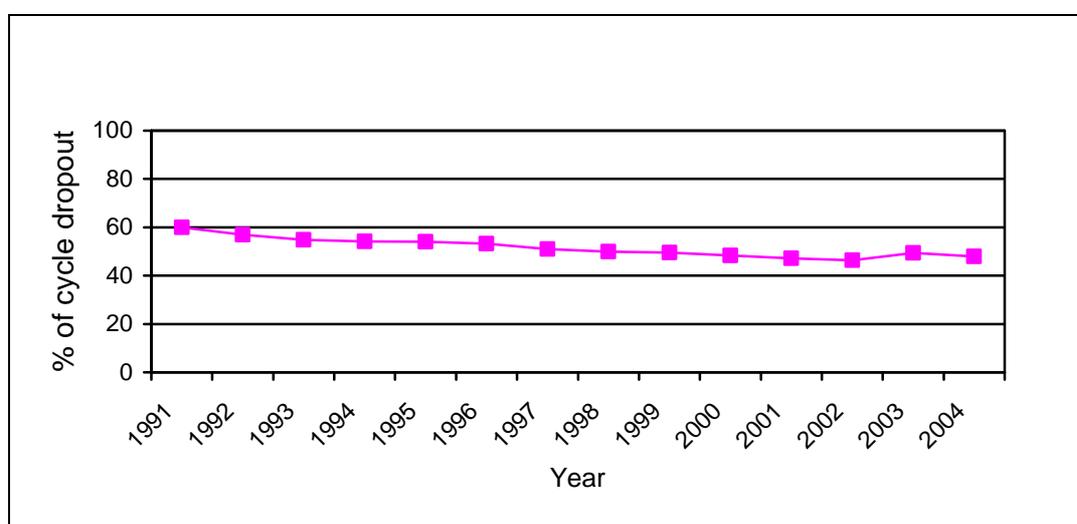
Source: DPE records for GPS and RNGPS schools (Ahmed et al, 2007). Notes: Dropout calculated as ratio of student who dropout during the year relative to total students registered in that year.

In many cases, children enter school but remain 'silently excluded' (Lewin 2007), which means that they have poor attendance records and very low school performance. In addition, they suffer from a lack of learning materials, the inability to pay school fees and employ private tutors (Karim, 2004), and are largely oblivious of teachers in the teaching sessions (Hossain, et al, 2003). All these factors increase the chances that children in Bangladesh do not complete primary education.

From recent literature in Bangladesh there are two major reasons for drop out. Over 40 percent children who dropped out of primary schools indicated that poverty was the main reason. Disliking school was cited by 37.5 percent as a main reason (Ahmed et al, 2005). Hossain et al. (2009) found that:

> Drop out children came from households with significantly lower income, and which were twice as likely to be 'always in need' on the food security measure. Similarly, these households were more likely to have a household head working in unskilled work, less likely to own a desk, radio, television or mobile phone, less likely to have electricity and more likely to have poor ventilation (Hossain et al., 2009:50).

At the secondary level, over half of the girls reported their cessation of schooling was due to marriage, a reason cited by only 2 percent of boys. Boys' departure was more likely to be due to the necessity for income earning for their families (44 percent), a reason much less frequently cited for girls drop out (Nath, et al., 2008).

Various editions of 'Education Watch', the NGO produced annual assessment of the status of education in Bangladesh, contain insights into drop out but none to date have attempted to track a cohort of children over several years. We now turn to the data that CREATE has been able to assemble by following a cohort of children from 2007.

3. Research Methods

The review of the literature confirms that the child and his/her responsibilities within the household, and the relationship between the school and the household are important factors influencing the process of drop out. In addition, poor school performance, low attendance and late enrolment are likely to be signals for teachers that children with these characteristics are more likely to drop out. In this section we describe the methods we used to investigate these issues empirically.

3.1 Data

CREATE's partner in Bangladesh, the Institute of Educational Development-BRAC University (IED-BRACU) has developed Community and School Studies (ComSS) in six locations, one in each of the administrative divisions of Bangladesh within the framework generated by the CREATE. The study covered 6,696 households with 9,045 children age 4-15 years from 18 school catchment areas (12 government primary schools and 6 registered non-government primary schools). Table 1 shows the total number of children aged 4 to 15 in 2007 and the corresponding number of children aged 6 to 17 in 2009 by their educational status, whether they were in school, had dropped out from school or had never been enrolled in education.

The survey was designed to understand the overall access to basic education situation in these districts in Bangladesh using CREATE's conceptual model of 'zones of exclusion' (Lewin, 2007). As a part of this COMSS study, a baseline survey was conducted in 2007 and after two years, in 2009, a follow up survey was done with the same households. This paper uses the data from both survey rounds to understand school dropout in Bangladesh.

We identified children who have been excluded from education in both 2007 and 2009 who are in 'zone 1' – never enrolled. We also identified children who dropped out from primary school (zone 2), and those who were enrolled in 2009 but not 2007. In principle it is also possible to identify those who are at risk of non-completion of the educational cycle (zone 3) because they had one or more of the following characteristics - irregular attendance, low attainment or grade repetition. This is consistent with the CREATE definition of zones of exclusion. Taking into consideration all the zones of exclusion significantly increases the number of possible patterns of educational access over time and in this paper we have chosen to concentrate on drop out.

Table 1: Total number of children included in survey, rounds 1 and 2

| | Survey round 1, 2007 | | | | Survey round 2, 2009 | | | |
| | Age 4-15 | | Age 6-15 | | Age 6-17 | | Age 6-15 | |
	#	%	#	%	#	%	#	%
Enrolled	7,170	79.3	6,685	87.8	7,086	78.3	6,573	80.8
Dropout	437	4.8	437	5.7	1,527	16.9	1,156	14.2
Never enrolled	1,438	15.9	495	6.5	432	4.8	409	5
Total	9,045	100	7,617	100	9,045	100	8,138	100
Source: ComSS Bangladesh 2007/2009								

3.2 Outcome Variable

We used information on access to schooling for all children aged 6 to 14 years in 2007 (hence 8 to 16 years in 2009) to generate our indicators of school status over time. Changes in enrolment status were constructed from information provided by the main carer (usually the mother) about the schooling status of children both in 2007 and in 2009. Table 2 shows the possible scenarios for schooling status. 349 children were persistently out of school, which represented 5.6 percent of the data. A further 5.7 percent dropped out from school between 2007 and 2009 whereas 4.5 percent entered schooling during this time. The majority of children remained in school in both periods (84 percent).

Table 2: Description of outcome variable (total number of children)

Survey 2007	Survey 2009	Outcome	Total
Out School	Out School	Persistently out of education	349
Out School	In School	Enter school	352
In School	Out School	Drop out	282
In School	In School	Continuously in education	5,233

Source: ComSS Bangladesh 2007/2009

3.3 Predictors of Drop Out in the Data

3.3.1 Factors that belong to the child

Individual level factors associated with the likelihood of drop out were gender, age, health status, and disability. In terms of health status, the following indicators were available in the data: mother or carer's reported the health of the child as being very good, good, regular, sometimes sick or always sick. Since this indicator was collected over two time periods, we constructed an indicator for changes in health status. Heath status improved if the child's health changed from regular or worse to good or very good health (25 percent of children). Health status deteriorated if the opposite happened (18 percent of children). Health status remained unchanged if it was regular or worse (14 percent of children) or good and very good (43 percent of children) in both periods.

Standardised weight, by age and gender, was obtained for all children. We differentiated between those children whose standardised weight was below one standard deviation of the sample of children and those whose standardised weight was one standard deviation above the sample. These children are considered to be at risk, either underweight or overweight. We estimated that 8.1 percent of the children had standardised weight below one standard deviation in 2007 and 12.1 percent in 2009. We estimated the proportion of children with weight above one standard deviation as 15 percent in 2007 and 16 percent in 2009.

Another indicator of health is whether the child plays normally like other children. This was reported by the main carer and is a subjective indicator, since it relates to whether the respondent thinks the child plays like other children. There are few cases where children did not play normally like other children, only 4.6 percent in 2007 and 3.7 in 2009. For this indicator we do not use changes over time, but simply the indicator in 2007 to estimate its relationship with the likelihood of dropping out.

The final indicator of health status is disability. Only 1.5 percent of children had a recognised disability as reported by the main carer. We combined information from 2007 and 2009 to

generate an indicator of disability. We did this as it is likely that a disability condition stays with the child for a long period, hence the fact that it was not reported in one time period could be due to the non-recognition of the problem. Even after combining this information, only 163 children were identified as disabled (2.6 percent of children). It is possible that other children are disabled but were not reported by households.

3.3.2 The child and its relationship within the household

One of the important indicators to capture the situation of the child within the household is child labour and child household responsibilities within the household. The ComSS data contain detailed information on the time spent on different activities, both within the household and outside of the household for children who were in school during 2007. Time spent on household work included all household chores and looking after other members. Time spent on income generating activities was divided into remunerated work for family and remunerated work outside the family. Over the two years, we estimated an increase in the time spent by children who were in school on household work (on average from 51 to 56 minutes a day), an increase in time spend on remunerated activities for the family (on average from 5.6 to 7.0 minutes a day) and a decrease in time spent on remunerated activities in the labour market (on average from 0.5 to 0.2 of a minute a day). We can only estimate the time spent on activities other than school work for children who were in school in 2007. We can then estimate whether time spent working was higher for children who dropped out in 2009 relative to children who remained in school in 2009.

Another useful indicator is whether children asked for help with school work and whether this help was given, either by parents or another family member. Of all children in school in 2007, 75 percent asked for help and got help from parents or another family member, 6.4 percent asked for help but did not get any help and 18 percent never asked for help. Again, this information is only available for children who were in school in 2007; hence it is only useful when comparing children who dropped out with those who remained in school between 2007 and 2009.

Parental interest in the children's schooling was measured by whether household members have attended teacher-parent meetings (49 percent of households), have gone to school to talk to the teacher (57 percent of households), or have been visited by the teacher (50 percent of households) within the last year. This information was only collected for children who were enrolled in school in 2007.

3.3.3 Cost of schooling and distance to school

Cost of schooling was measured by the total yearly expenditure on education, including all direct and indirect cost of schooling, except opportunity costs. On average, 3.5 percent of parental annual income was used for the child's education. Distance to school was measured in kilometres, with an average distance between households and school of one kilometre.

3.3.4 Households Characteristics

Household level variables included household income, parental education, parental occupation, and other socio-demographic information of the household. Household income was measured in both time periods. Real income was obtained by deflating yearly income by 17 percent, which is the estimated inflation rate between 2007 and 2009. Average income in

real prices was 5,588 Taka in 2007 and 5,337 Taka in 2009, a reduction in real income of 4.5 percent[1]. Two indicators were obtained for household income, real per capita income and the proportion of households below the 50 cents a day poverty line[2]. Since these indicators were collected in both periods, we were able to measure changes over time.

Parental education was measured by the highest level of education of the mother or father (46.6 percent with some primary education). Parental occupation was measured by a dummy variable to differentiate those in unskilled or low-status occupations (47 percent of households) from the rest. The child dependency ratio was measured by the number of children under the age of 15 relative to the household size (0.50) and the total dependency ratio was measured by the number of children and elderly relative to the total household size (0.52). Female-headed households were differentiated from male-headed households (only 6.1 percent of households were headed by women).

3.3.5 School precursors of drop out

For all children going to school in 2007, information was collected on school attendance, repetition, relative performance in class, and age-in-grade. Weekly attendance was measured by the number of days the child was absent from school during the week prior to the survey (8 percent of children who were in school in 2007 were absent for at least one day). Grade repetition was measured by the number of times the child had repeated a school year (16 percent of ongoing school children in 2007 had repeated at least once). Child school performance was measured by the mother's or main carer's perception on whether the child was among the top 25 percent, the upper middle, the lower middle or the lowest 25 percent of the class. This was necessary in the absence of any standardised tests. The distribution of responses was biased towards the middle part of the distribution, with only 10 percent of mothers rating their children among the lowest 25 percent of the distribution. In addition, 14 percent of the mothers did not know their children's relative performance in school. Finally, on-time progress in school was measured by the proportion of children who were enrolled in the right grade for their age (80 percent of children enrolled in school in 2007 were in the correct grade for their age)[3]. All this information is useful when comparing children who dropped out with those who remained in school between 2007 and 2009.

3.4 Analytical Strategy

The longitudinal nature of the data enables us to observe children entering into education, children dropping out of education, children remaining out of education and children remaining in schooling over the two year period. Hence, we investigate factors associated with the likelihood of children belonging to each of these groups. For example, we expect positive changes in health to be associated with lower likelihood of school drop out and higher likelihood of children entering into education. At the same time, positive changes in

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[1] Bangladeshi Taka-GBP exchange rate 132 Taka per GBP in 2007 and 115 Taka per GBP in 2009.
[2] Most households interviewed lived below the US 1 Dollar a day (90 percent of the households). Hence the US 0.50 Cents a day was a better indicator for this sample to differentiate those who were living in extreme poverty.
[3] Age-in-grade was considered for those children who were of the age appropriate or one year above. This is to avoid discrepancies between school year cycle and calendar year. So children aged 6 and 7 were considered to be in age appropriate for Grade 1, those aged 7 and 8 for Grade 2, and so on. This is discussed at greater length in Hossain (2010b).

health could have a sustaining effect on children remaining in education and lowering the chances that children will remain persistently out of education[4].

For each of the factors described in Section 3.3, we investigate whether there is a relationship with school status over time. Empirically, we use contingency tables as well as statistical tools to test for independence and strength of the relationship between predictor and our outcome variable. Statistical tests used depend on the nature of these variables. Our outcome variable drop out is categorical, and is related to measurements of independent factors. Some of these are ordinal, such as parental education, others continuous, such as parental income, and still others categorical, for example changes in health status.

In order to investigate the relationship between these factors and the likelihood of drop out we use multivariate regression analysis. We compare children who dropped out from school between 2007 and 2009 (352 children). Other children are divided into three groups: those who remained out of school during this period (349 children); children who entered into education (282 children); and children who remained in education during this period (5,233 children). In order to simplify the analysis and the interpretation of results we use logistic regression for each of the comparisons[5]. With this analytical strategy our aim is to estimate differences between the children who actually dropped out and another marginalised group (children who are permanently excluded from education). We also estimate differences between children who dropped out and those who enrolled in education by 2009. Finally, we estimate differences between children who dropped out and those who remained permanently in education. Some of the children who were enrolled may be silently excluded from educational access as suggested by the CREATE conceptual model of zones of exclusion.

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[4] Of course one could argue that movements in and out of school are not the result of changes in health status but that the opposite is true (reverse causality). School drop out (or drop in) may be associated with changes in health status since children's health can improve as a result of schooling. For example, the provision of school meals can improve child nutrition. Reverse causality is problematic if the aim of the paper were to test causality in a narrow sense. Our empirical evidence identifies associations that identify the correlates of drop out.

[5] An alternative approach is to use multinomial logit models. In general, the multinomial logit model is the generalisation of the logit model. In the multinomial logit model, we leave one group as comparison and estimate the factors that predict the relative risk that children fall into one of the categories relative to the reference category. The independence of irrelevant alternatives and the zero correlation of residuals imply that results from the multinomial logit model are equivalent to those obtained from the combinations of logit models. However, there are several factors that can only be used to compare children who dropped out with those who remained in school, hence the usefulness of estimating independent logit models.

4. Results

4.1 Drop Out versus Remained In School

Table 3 shows the bivariate relationships between different individual level factors for children who dropped out from school between 2007 and 2009 and those who remained in school during this period. For each relationship we estimated the statistical test for independence. Our results show that gender is associated with likelihood of drop out. Only 34 percent of children who dropped out were girls. This difference is statistically significant at one percent level (t-test for mean differences 5.89). Age is also related to likelihood of drop out. Children who dropped out were, on average, older than those who remained in school. Changes in health status were not associated with drop out, but a higher proportion of underweight and overweight children dropped out compared with children who remained in education. Similarly, a higher proportion of children who did not play normally and those who were disabled dropped out.

Table 3: Individual level factors: Drop Out versus Enrolled In School

		Enrolled	Drop out	Statistical test	
Gender (female)	Mean	0.51	0.34	t-test	5.89**
Age	Mean	9.2	10.7	t-test	12.6**
Health Status					
Good health	Proportion	44.7	42.6	LRT	3.01
Improved	Proportion	25.1	23.3		
Deteriorated	Proportion	17.5	21.0		
Bad health	Proportion	12.7	13.1		
Weight					
Below 1 s.d.	Proportion	7.8	9.4	LRT	6.96*
Above 1 s.d.	Proportion	15.2	20.0		
Between -1 & 1 s.d.	Proportion	76.9	70.6		
Child Plays Normally	Mean	0.96	0.94	t-test	2.22*
Disability	Mean	0.02	0.04	t-test	3.28**
Source: Bangladesh CommSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively. LRT = Likelihood Ratio Test					

Table 4 shows the relationship for factors that measure the relationship of the child within the household and within the school. There are striking differences between children who dropped out and those who remained in school. First, the average time that drop out children spent doing household work was 89 minutes compared with 55 minutes for children who remained in school. Second, 77 percent of children who were enrolled in school and who asked for help from their parents received it; only 56 percent of dropped out children received help from their parents. The proportion of drop out children who asked for help and did not receive it (13 percent) was more than double the proportion of children enrolled in school who asked for help and did not receive it either (6 percent). Similar differences were found for children who did not ask for help at all.

The variables that relate to parental interest in the child's schooling were statistically significant between these groups. A higher proportion of parents whose children remained in school attended parent-teacher meetings, spoke with the teacher or were visited by the

teacher. This last association may indicate that where teachers do visit households of those at risk of drop out their interventions do have the effect of reducing subsequent drop out. Children who ended up dropping out from school had higher levels of absenteeism, grade repetition, and being overage for their grade.

School precursors of drop out, absenteeism, grade repetition, over age and performance, showed the expected results with respect to drop out. On average, children who dropped out by 2009 already had greater school absenteeism in 2007 than children who remained in school. Similarly, children who dropped out had also higher grade repetition in 2007 than children who remained in school between 2007 and 2009. Drop out children were more likely to be over age by two or more years (33 percent) compared with children who remained in school (23 percent). Finally, children who dropped out were more likely to be identified by their carers as not performing academically relative to other children. A greater proportion of children who dropped out were identified as in the lower-middle part of the performance classification. There was some evidence that caregivers had difficulty placing their children on different points of the achievement distribution since this was a subjective measure based on information from schools and children which varied between schools.

Table 4: Child within household and child within school: Drop Out versus In School

		Enrolled	Drop out	Statistical test	
Child Within Household					
Time spent working	Mean	0.91	1.49	t-test	9.43**
Ask for Help					
Yes and got it	Proportion	77.1	55.7	LRT	73.71**
Yes and did not get it	Proportion	6.0	13.1		
Did not ask for help	Proportion	16.9	31.2		
Teacher-parent meeting	Mean	0.51	0.44	t-test	2.29**
Spoke with teacher	Mean	0.60	0.52	t-test	3.05**
Visited by teacher	Mean	0.53	0.42	t-test	4.21**
School Precursors of Drop Out					
Absenteeism	Mean	0.18	0.52	t-test	7.56**
Grade repetition	Mean	0.19	0.31	t-test	4.79**
Overage	Mean	0.23	0.33	t-test	5.54**
Performance					
Top 25%	Proportion	14.8	13.1	LRT	22.62**
Upper-middle	Proportion	34.2	33.5		
Lower-middle	Proportion	25.4	35.8		
Bottom 25%	Proportion	11.3	7.1		
Unkown	Proportion	14.3	10.5		
Source: Bangladesh ComSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively. LTR = Likelihood Ratio Test					

Finally, Table 5 shows the cost and distance to schooling. Interestingly, per capita school expenditure in 2007 was not statistically different between children who dropped out and those who remained in school. Distance to school was not statistically significant either, though this might partly be because most children were not located far from schools.

Household level factors were associated with a likelihood of dropping out in the expected direction (Table 5). Children who dropped out were more likely to come from poorer households compared with children who remained in school in both periods. In addition, household income for children who dropped out from school dropped by 2.4 percent compared with a zero percent real change in household income for parents of children who remained in school. A higher proportion of children who dropped out lived below the US $0.50 a day poverty line in 2007 and remained below this poverty line in both time periods, compared with children who were in school.

The education of parents of children who dropped out was lower than for parents of children who remained in school, and a higher proportion of parents of children who dropped out had unskilled occupations, compared with children who remained in school. Finally, there was evidence of differences in child dependency ratio but not in total dependency ratio. A higher child dependency ratio was estimated for the families of children enrolled in education.

Table 5: Household and school variables: Drop Out versus In School

		Enrolled	Drop out	Statistical test	
Cost and Distance to School					
PC school expenditure	Mean	0.035	0.033	t-test	0.89
Distance to school	Mean	1.02	1.12	t-test	1.73
Household					
PC income 2007	Mean	1026	800	t-test	4.46**
Real income growth	Mean	0.001	-0.024	t-test	1.86*
Below US$ 0.50 a day	Mean	0.71	0.83	t-test	5.02**
Persistently below $0.50	Mean	0.56	0.71	t-test	5.55**
Education above secondary	Mean	0.57	0.45	t-test	4.25**
Unskilled occupations	Mean	0.44	0.56	t-test	4.30**
Child dependency ratio	Mean	0.50	0.48	t-test	2.55*
Total dependency ratio	Mean	0.52	0.50	t-test	1.90
Female headed household	Mean	0.06	0.08	t-test	1.74
Source: Bangladesh CommSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively.					

4.2 Multivariate analysis: Drop Out versus In School

Having undertaken detailed analysis of the different factors that may be associated with the likelihood of drop out, we now perform multivariate logistic analysis. For this analysis we compare children who drop out and those who remained in school in both periods. The estimate uses all factors provided in tables above, regardless of whether these factors were statistical significant or not with the t-test. It is possible that those that were statistically significant in the bivariate relationship become statistically insignificant when other factors are introduced in the analysis.

We found that girls were only 0.36 times less likely to drop out than remain in education compared with boys (Table 6). This may in part reflect the success of the campaigns and incentives provided to discourage female drop out. Age is a very important determinant, since an additional year is associated with an increase of 1.57 times in the likelihood of

dropping out relative to remaining in education. Interestingly, we found that being above the standardised weight for age is associated with greater likelihood of dropping out relative to remaining in education. This result is surprising as we expected that being underweight would be associated with an increased likelihood of drop out, but this was not the case in this sample. It should be noted that there are uncertainties about the ages of children which may reduce the reliability of these estimates.

In terms of the relationship of the child within the household we found that the higher proportion of time that children spend working the greater the likelihood of dropping out relative to remaining in education. New insights into the factors that may be related to drop out are the relationship of the child to the parents, in particular the indicator of whether the child requested help for school related work and received this help from parents or a family member. Compared to children who asked for help and received, those who asked for help and did not get it were nearly twice as likely to drop out rather than remain in education. Similarly, children who did not ask for help were 1.7 times more likely to drop out than children who asked for help and received it.

Indicators related to the child within the school also remained statistically significant predictors of drop out. In particular, greater school absenteeism and higher grade repetition were associated with higher odds ratios for drop out. School performance, as reported by the mother, was only statistically significant when comparing children in the lower middle of the distribution relative to those placed at the top 25 percent. The sign of this coefficient was in the expected direction, indicating that children whose mothers rated them in the middle lower part of the performance distribution were more likely to drop out relative to children whose mothers rated them in the top 25 percent of the distribution. Interestingly, we found that being over age in grades was not associated with an increased likelihood of drop out in multivariate analysis. This result may be explained by the inclusion of age as a determinant of drop out.

Per capita expenditure in education was associated with likelihood of drop out relative to remaining in education. The higher the per capita expenditure the lower the chances of school drop out. This may be interrelated with household interest in child schooling. Children whose parents have been visited by the teacher have a lower probability of dropping out relative to remaining in education compared with children whose parents have not been visited by the teacher. This result has to be contextualised with respect to reasons why some parents are visited by teachers.

Finally, among household level factors we found that household income and parental education were associated with the likelihood of drop out relative to remaining in education. Interestingly for income, we found that both the level of income and income growth reduce the likelihood of school drop out. The result for income growth is particularly important. Higher income growth during this period was associated with lower chances of school drop out. Children of parents with secondary education were 0.61 times less likely to drop out compared with children of parents with less than secondary education.

Table 6: Estimated odd ratio [s.d.] of likelihood of drop out: comparison group children who remained in school

VARIABLES	Odd ratios	Standard Error
Girls	0.363**	[0.049]
Age	1.576**	[0.068]
Weight above 1 s.d.	1.567**	[0.263]
Time spent working	1.169**	[0.065]
Ask for help did not get it *vs.* Ask help and got it	1.943**	[0.427]
Did not ask for help *vs.* Ask for help and got it	1.789**	[0.268]
Visited by teacher	0.660**	[0.104]
Absenteeism	1.239**	[0.065]
Grade repetition -2 years	1.950**	[0.473]
Performance Lower-middle *vs.* Top 25%	1.685*	[0.354]
School expenditure per capita	0.912**	[0.023]
PC income 2007 (in logs)	0.376**	[0.069]
Real income growth	0.661**	[0.078]
Education above secondary	0.612**	[0.095]
Constant	1.577	[2.187]
Observations	5283	

Source: ComSS. Notes: Asterisks *, ** represents statistical significance at 5 and 1% level, respectively.
Only factors statistically significant shown here. Factors not statistically significant were child health
whether child plays normally, disability, overage, several indicators of school performance,
distance to school, teacher-parent meeting, speak with teacher, persistently poor, unskilled occupation
total dependency ratio and female head of household.

4.3 Drop Out versus Enrolled in School on 2009 but not 2007

Table 7 shows results on factors that predict differences between children who dropped out from school between 2007 and 2009 and those who enrolled in school during this period. A relatively higher proportion of girls moved into education (0.47 percent) than dropped out (0.34 percent). Age is a strong determinant of differences between children who dropped out and those who enrolled in education. We found some differences in the distribution of health status, whereby a high proportion of children who enrolled in education reported improved health relative to children who dropped out. Also, those children whose weight was above one standard deviation were more likely to drop out relative to move into education. These differences were statistically significant. We did not find differences in behaviour of playing with other children or disability between children who dropped out and those who enrolled in education.

Table 7: Individual level factors: Drop Out versus Enrolled in 2009 but not in School in 2007

		Move in	Drop out	Statistical test	
Gender (female)	Mean	0.47	0.34	t-test	3.37**
Age	Mean	7.3	10.7	t-test	23.4**
Health Status					
Good health	Proportion	27.7	42.6	LRT	29.68**
Improved	Proportion	34.7	23.3		
Deteriorated	Proportion	14.5	21.0		
Bad health	Proportion	23.1	13.1		
Weight					
Below 1 s.d.	Proportion	10.6	9.4	LRT	19.56**
Above 1 s.d.	Proportion	7.7	20.0		
Between -1 & 1 s.d.	Proportion	81.7	70.6		
Child Plays Normally	Mean	0.95	0.94	t-test	0.54
Disability	Mean	0.05	0.04	t-test	0.26
Source: Bangladesh ComSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively. LTR = Likelihood Ratio Test					

Contrary to the expectation that children who enrolled in education between 2007 and 2009 might have some advantage, in terms of household income or other resources, over children who dropped out, we found little evidence of differences. Table 8 shows that children who started education during this period at whatever age lived in households with similar levels of income and poverty to the households of children who dropped out. It may be that many children who started education during this period did it at a late stage, or had already dropped out and decided to return into education. One suggestion that this is the case is the dependency ratios, which showed that children who enrolled in education lived in households with much higher dependency ratios than households of children who dropped out. Interestingly, a lower proportion of children who enrolled in education by 2009 and who were probably over age had parents with education above primary level.

Table 8: Household level factors: Drop Out versus Enrolled in 2009 but not in School in 2007

		Move in	Drop out	Statistical test	
Household					
PC income 2007	Mean	771	800	t-test	0.51
Real income growth	Mean	-0.056	-0.024	t-test	1.66
Below US$ 0.50 a day	Mean	0.82	0.83	t-test	0.32
Persistently below $0.50	Mean	0.69	0.71	t-test	0.74
Education above secondary	Mean	0.25	0.45	t-test	5.45**
Unskilled occupations	Mean	0.61	0.56	t-test	1.38
Child dependency ratio	Mean	0.53	0.48	t-test	5.20**
Total dependency ratio	Mean	0.55	0.50	t-test	4.62**
Female headed household	Mean	0.05	0.08	t-test	1.43
Source: Bangladesh CommSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively.					

4.4 Multivariate analysis: Drop Out versus Enrolled in 2009 but not in School in 2007

Table 9 shows results from multivariate logistic analysis for the risk of drop out using children who were enrolled in 2009 but not 2007 as a comparison group. The first observation is that there are fewer factors associated with the risk of drop out when we compare these two groups of children as suggested by our previous bivariate analysis. Fewer girls than boys drop out than enrol by 2009. Older children were more likely to drop out than to enrol by 2009. Interestingly, children whose parents reported improved health were less likely to drop out. Finally, children living in female headed households were 3.6 times more likely to drop out than to enrol by 2009 compared to children living in male headed households.

Table 9: Estimated odd ratio [s.d.] of likelihood of drop out: comparison group children enrolled in 2009 but not in school in 2007

VARIABLES	Odd ratios	Standard Error
Girls	0.451**	[0.116]
Age	2.318**	[0.164]
Improved Health *vs.* Persistent Good Health	0.373**	[0.125]
Deteriorated Health vs. Persistent Good Health	0.810	[0.262]
Persistent Bad Health vs. Persistent Good Health	0.436*	[0.156]
Weight below 1 s.d.	0.864	[0.349]
Weight above 1 s.d.	2.095	[0.811]
Child plays normally	1.985	[1.239]
Disability	0.962	[0.628]
PC income 2007 (in logs)	0.920	[0.304]
Real income growth	1.127	[0.253]
Persistently below $0.50	1.564	[0.555]
Education above secondary	1.656	[0.481]
Unskilled occupations	0.670	[0.169]
Child dependency ratio	0.129	[0.230]
Total dependency ratio	1.982	[3.382]
Female headed household	3.643*	[2.284]
Constant	0.002*	[0.004]
Observations	596	

Source: ComSS. Notes: Asterisks *, ** represents statistical significance at 5 and 1% level, respectively.

4.5 Drop Out versus Permanently Out of School

Comparing children who dropped out during 2007 and 2009 with those who remained completely out of education during this period provides some further interesting insights. In terms of individual characteristics, there are no gender or age differences between these groups of children, although there are differences in whether children who remained permanently excluded from education were disabled, did not play normally or had health issues (Table 10).

Table 10: Individual level factors: Drop Out versus Permanently Out of School

		Permanently Excluded	Drop out	Statistical test	
Gender (female)	Mean	0.31	0.34	t-test	0.96
Age	Mean	10.5	10.7	t-test	0.48
Health Status					
Good health	Proportion	34.7	42.6	LRT	27.23**
Improved	Proportion	31.2	23.3		
Deteriorated	Proportion	11.2	21.0		
Bad health	Proportion	22.9	13.1		
Weight					
Below 1 s.d.	Proportion	10.5	9.4	LRT	1.28
Above 1 s.d.	Proportion	16.7	20.0		
Between -1 & 1 s.d.	Proportion	72.7	70.6		
Child Plays Normally	Mean	0.82	0.94	t-test	4.71**
Disability	Mean	0.14	0.04	t-test	4.46**
Source: Bangladesh ComSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively. LTR = Likelihood Ratio Test					

In terms of household characteristics, Table 11 shows that children who are permanently excluded lived in households with similar levels of income poverty as children who dropped out. The financial situation over time of households where children were permanently out of school was, however, much worse than for children who dropped out. The real per capita household income for children permanently out of school was reduced by 8.7 percent on average compared with a reduction of 2.4 percent for children who dropped out. A higher dependency ratio and lower levels of parental education were associated with higher likelihood of permanently being excluded from education compared with dropping out.

Table 11: Household level factors: Drop Out versus Permanently Out of School

		Permanently Excluded	Drop out	Statistical test	
Household					
PC income 2007	Mean	804	800	t-test	0.051
Real income growth	Mean	-0.087	-0.024	t-test	1.94*
Below US$ 0.50 a day	Mean	0.84	0.83	t-test	0.46
Persistently below $0.50	Mean	0.74	0.71	t-test	0.61
Education above secondary	Mean	0.24	0.45	t-test	5.98**
Unskilled occupations	Mean	0.64	0.56	t-test	2.14*
Child dependency ratio	Mean	0.52	0.48	t-test	3.99**
Total dependency ratio	Mean	0.54	0.50	t-test	3.62**
Female headed household	Mean	0.07	0.08	t-test	0.68
Source: Bangladesh CommSS 2007-2009. Notes: Asterisks *, ** indicate statistical significance at 5 & 1% level, respectively.					

4.6 Multivariate analysis: Drop Out versus Permanently Out of School

Multivariate analysis confirms some of the bivariate associations obtained above (Table 12). Children whose health deteriorated were 1.9 times more likely to drop out than those remaining permanently out of education compared with children whose health was persistently good. Children who were not playing normally were more likely to remain permanently out of education than be drop outs. Similar results were obtained with respect to disability. Finally, we found that both income and parental education were associated with the likelihood of children dropping out from school relative to remaining out of education. Those children who dropped out lived in richer, better educated households than children who remained permanently excluded from education.

Table 12: Estimated odd ratio [s.d.] of likelihood of drop out: comparison group children permanently out of education

VARIABLES	Odd ratios	Standard Error
Girls	1.229	[0.231]
Age	0.971	[0.042]
Improved Health *vs.* Persistent Good Health	0.705	[0.149]
Deteriorated Health vs. Persistent Good Health	1.899*	[0.522]
Persistent Bad Health vs. Persistent Good Health	0.662	[0.175]
Weight below 1 s.d.	1.224	[0.343]
Weight above 1 s.d.	1.239	[0.279]
Child plays normally	3.034**	[0.991]
Disability	0.372*	[0.145]
PC income 2007 (in logs)	1.378	[0.309]
Real income growth	1.489*	[0.248]
Persistently below $0.50	1.456	[0.376]
Education above secondary	2.376**	[0.479]
Unskilled occupations	0.906	[0.168]
Child dependency ratio	0.274	[0.359]
Total dependency ratio	0.56	[0.718]
Female headed household	1.598	[0.535]
Constant	0.103	[0.178]
Observations	642	

Source: ComSS. Notes: Asterisks *, ** represents statistical significance at 5 and 1% level, respectively.

5. Discussion

This paper set out to investigate the factors associated with the likelihood of dropping out from school for children living in poor districts in Bangladesh. Looking into the process of drop out requires data that follows children over time. This is what the CREATE project in Bangladesh set out to do in 2007, when a group of children selected from 18 school catchment areas were selected for a longitudinal study of access to education. Two rounds of information form the basis for the analysis that we undertook in this paper.

In 2007, during the first round of interviews, over 10 percent of school age children were not in education in the catchment areas. By 2009, the school status of all children was recorded again and with this information we identified transitions into and out of education. Some children remained in schooling, others dropped out, others were enrolled in 2009 but not in 2007, and others remained permanently excluded from education. All these children formed the basis of our research enquiries. In particular, we were interested in differences as well as similarities between children who dropped out from school and the rest of the children. For instance, is poverty related to school drop out when we compare children who dropped out with children who entered school? What is the poverty status of drop out children versus children who remained in education or between drop out children and children who remained permanently excluded from education? Do children who drop out come from the poorest families?

Our first set of results refers to differences between children who dropped out and those who remained in school between 2007 and 2009. Although all the children who participated in this study lived in deprived areas, we found very important differences between households where children dropped out and those where children were continuously enrolled that could shed some light into the factors that predict school drop out. One of these factors refers to the relationship of the child within the household and the support received from parents when the child requested help for school work. Children who remained in education were more likely to receive support from their families for school work and spent less time doing household work or engaged in income generating activities. In addition, children whose teachers visited their parents to discuss school related work were also less likely to drop out. Finally, higher expenditure per child in education was associated with reduced chances of dropping out from school. All these factors indicate the importance of the household in influencing decisions to remain at school. It is not only income, but parental interest and engagement in children's schooling that determines whether these children remain in education.

Interestingly, we did not find that over age was simply associated with school drop out. One would have expected that being two or more years above the age in grade specific should have been related to drop out. That is, children who were 8 year or older in Grade 1 should be more likely to drop out than children who were 6 or 7 years old. To test this further, we included an interaction term between grade and over age and found that grade was associated with likelihood of drop out with an increasing relationship for those who were over age. This means that over age children in higher school grades are much more likely to drop out than over age children in lower school grades. This result is consistent with findings from EPDC (2009). In addition, Sabates et al. (2010) showed that risk of drop out was related to age in several African countries. Together these results indicate that the problem of drop out for children who are over age is likely to occur after a few years in primary school and is particularly severe for older children.

The above result is also consistent with our finding that grade repetition is linked to drop out, but not for children who have only repeated once. Only children who have repeated more than twice have increasing chances of dropping out from school. This issue provides an opportunity for targeting interventions for children who are still in school but who are at high risk of dropping out. Grade repetition, after a few years of primary school, may give schools a clear indication for targeting resources towards children who are at risk, in particular if these children are much older than the rest of their classmates.

Overall, when we compared children who dropped out with those who remained in education we see clear areas for policy interventions. First, school absenteeism, over age and grade repetition are precursors of drop out. Schools then, have an important role to play first in identifying these children and secondly in targeting efforts to prevent them from leaving education. Secondly, the relationship between teachers and parents seems to be important in reducing the risk of drop out. Schools may need to strengthen links and communication with parents and communities. But parents have also an important role to play, not only with the provision of material resources for children, but also helping them when school work is needed. If children do not see that their parents care, perhaps they do not see the value of education either. Lastly, there is the issue of financial support, as children who dropped out came from poorer households across this sample of materially deprived children. Direct and indirect costs have to be reduced to zero, and subsidies may be necessary to ensure the sustained enrolment of the poorest.

The second set of results refers to differences between children who dropped out and those who enrolled in 2009 but not 2007. Although we have only partial indicators for exploring differences between these children we found very little variation. There are gender and age differences, both in the expected direction. Older children were more likely to drop out than move into school. Boys were more likely to drop out than enrol in education in 2009. Gender differences are mainly driven by differences in the likelihood of drop out (since 65 percent of drop outs were boys), than in likelihood of starting or re-entering school (since 52 percent were boys). We also found differences in health status, in particular improving health was associated with greater chances to start or re-enter school.

Income, parental education, parental occupation and income growth were factors that did not explain differences between children who drop out and those who enrolled by 2009. This may be surprising as socioeconomic factors are usually significant in explaining educational status. One reason may be that children who moved into education did not start on time. There were children aged 6 to 15 who were not in education in 2007 when they should have been, but who were in education two years later. It is possible that these children were not able to start education because of poverty and two years later they started education. Another possible reason may be that children re-entered education, or they moved in and out of education, in which these children had previously dropped out. Both of these possible reasons may explain why children who enrolled and those who dropped out were similar in terms of the socioeconomic characteristics of their households. If indeed there are no differences in income or income growth, or even more, if income growth of families with children who entered education was lower than for families with children who drop out, it is likely that children who enrolled late in education have a high risk of drop out in the future. Understanding the dynamics of children who moved in and out of education requires a study that spans over a longer period and collects information at shorter time spans.

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A late start to education provides a clear signal to teachers and head teachers of the probable difficulties that these children will face over time. Clearly late starters will be over age. The older they become, the higher the opportunity cost of schooling in terms of the forgone income that is needed to cover for household needs, even if this income comes from non-remunerated activities within the household such as child care. Hence, late starters face a high risk of leaving schooling, possibly without even completing a full cycle of primary education. Late starters are identified as possible targets for educational interventions aimed to secure their progression and completion of basic education.

Our last set of results focuses on children who remained permanently excluded from education between 2007 and 2009. These children were more likely to be disabled and less likely to play normally than children who dropped out. Permanently excluded children lived in families who were even poorer than families of children who dropped out and had parents with lower levels of education than the parents of children who dropped out. This is a picture of a severely marginalised group of children, who require special education or other forms of intervention to secure their inclusion into education and aid their progression through the cycle of primary and lower secondary schooling if meaningful learning is to be achieved.

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Report summary:
This report provides new evidence into the factors that predict school drop out for children in Bangladesh. It also examines similarities and differences between children who enter late into primary schooling, those who are permanently excluded and those who drop out. Our results show that the relationship of the child within the household and the possible support received from parents when the child requested help for school work were factors associated with the risk of drop out. In addition, over age in the final years of primary school and low school attendance were signals of a high risk of school drop out. Children who started school late were similar to children who drop out in terms of background family characteristics. However, children who were permanently excluded from school were poorer and more marginalised than children who dropped out. Several recommendations are drawn from the analyses of this report.

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