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The Socioeconomic Impact of HIV/AIDS on Education Outcomes in Uganda: School Enrolment and the Schooling Gap in 2002/03

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Abstract

Due to high prime-age mortality in Uganda, a result of the HIV/AIDS scourge, the number of children who have lost at least one parent continues to rise in the country. The increase in numbers of orphans has challenged the overall socio-protection mechanisms and in particular threatens the country's ability to achieve education development targets. Using the 2002/03 Uganda National Household Survey, this study investigates the impact of parental death—from HIV/AIDS as well as causes on the school enrolment and grade for age school progression. We find that HIV/AIDS orphans are not significantly less likely to continue schooling but are by far more likely to fall below their appropriate grade. On the other hand, we find that all orphans—regardless of cause of parental death are less likely to continue schooling and the gaps in enrolment decreases at higher levels of household welfare status—poor orphans are significantly less likely to continue schooling.

1.0 Introduction

Given the increasing prevalence of HIV/AIDS in sub-Saharan Africa (SSA), understanding the socio-economic impact of the disease is an important policy issue. The HIV/AIDS pandemic has not only led to great suffering of the victims of the disease but has also spurred a generation of children without parents. In the sub region, the number of children who have lost at least one parent increased from 28 million in 1990 to 43 million by 2003, and the proportion of these orphans[3] attributed to HIV/AIDS increased from 2% to 37% during the same period (UNICEF, 2004). Worse still, in some instances, orphans are also battling with the disease (acquired through mother to child transmission at birth) which exacerbates their vulnerabilities. The 2004 Children at the Brink report by UNAIDS estimates that globally 2.1 million children under the age of 15 were living with HIV/AIDS as of 2004.

Specific to Uganda, although the country's HIV/AIDS prevalence rate declined from 30% in the early 1990s to the about 6 % by 2004/05 (GoU, 2006a), the number of orphans continues to rise (Table 1). For example, between 1999/2000 and 2002/3, the number of orphans increased from 1.7 million to over 2 million children. More recent estimates indicate that the number of orphans in Uganda had reached 2.3 million children by the end of 2003 (UNICEF, 2007). Furthermore, out of the above figure at least 45 % are attributed to HIV/AIDS. Given the psychological and economic effects associated with parental loss, issues relating to orphan's education are a priority in Uganda just like other countries battling the effects of the disease.

Indeed, the schooling status of orphans is a matter of public concern in Uganda due to concerns that the particular category of children may be disadvantaged with respect to access to social services. For example, the Uganda participatory poverty assessments report that orphans are faced with inadequate nutrition which affects the level of concentration while at school (GoU, 2002). As such, government policies for example the Poverty Eradication Action Plan (2004-2008) considered orphan's access to schooling as important in the country's quest to attain the Millennium

[3] Orphans are defined as children below 18 years who have lost at least one parent. They can either be paternal orphans—children who have lost their father but the mother is alive, maternal orphans—children who have lost their mother but father is alive, or double orphans—children who have lost both parents.

Development Goals (MDGs). Consequently, during the PEAP implementation, the Ministry of Gender Labour and Social Development produced an orphan and vulnerable children's policy that sought to provide adequate socio-economic protection of vulnerable groups. Furthermore, the policy advocated for periodic investigations of the magnitude as well as the various facets of the orphan problem in Uganda.

Apart from policy pronouncements, a number of programs have been implements in Uganda to address various orphan vulnerabilities including those that relate to schooling. Although majority of the interventions have been undertaken at a small scale—initiated by resource constrained Non Governmental Organizations (NGOs), a few large scale public interventions—supported by development partners have also constraints faced by orphans. The most notable public program, which specifically targeted HIV/AIDS orphans schooling was the Community Led HIV Initiative (CHAI) project—operational during 2002-2007. This project, implemented in 30 districts in Uganda, paid tuition fees for children from HIV/AIDS affected households that were unable to enroll in secondary school (Uganda AIDS Commission, 2007). In northern Uganda, a region with some of the highest HIV/AIDS prevalence rates (Ciantia, 2004), the project operated as part of the Vulnerable Groups Sub-projects (VGS) component of the Northern Uganda Social Action Fund (NUSAF) in 8 districts of the region. In this particular region, communities were supported to identify the most deserving HIV/AIDS orphans that were not attending secondary school. Nonetheless, as indicated in our discussions later, the replication of similar programs at a national scale presents targeting challenges. But even then, an understanding of the potential effects of such programs on HIV/AIDS orphans schooling outcomes can provide information on appropriate interventions for the overall social protection of all vulnerable groups.

Due to paucity of data, only a few studies have investigated the impact of HIV/AIDS on education in Uganda[4]. Majority of the studies on Uganda are based on small samples—covering only a few districts. On the other hand, among the studies based on nationally representative samples, only a few explicitly focus on parental death

[4] Empirical examples include: De Walque, 2007; Yamano et.al, 2006; Deininger et.al, 2003; and Ntozi, 1997.

arising from HIV/AIDS. In the present study, we have access to a dataset—the 2002/03 Uganda National Household Survey (UNHS) that for the first time inquired from households with orphans whether the cause of parental death was due to HIV/AIDS. Prior and even subsequent national household surveys, do not probe the cause of death of parents. Apart from the availability of an appropriate dataset which allows us to identify HIV/AIDS orphans, there are other important reasons for focusing on the education of HIV/AIDS orphans. Evidence from other African countries indicates that surviving children may be psychologically affected leading to school non-attendance, given the stigma that continues to be attached to HIV/AIDS (Evans and Miguel, 2007).

Consequently, we investigate the impact of HIV/AIDS parental death on children's human capital outcomes in Uganda. In particular, we probe the following questions: (i) does the death of a parent from HIV/AIDS affect the overall likelihood of a child continuing schooling in Uganda? (ii) For orphans that continue with school, are they more likely to fall below the appropriate grade? We estimate probit regressions for school enrolment as well ordinary least squares (OLS) regressions for determinants of schooling gap. This is defined as the number of years a child in school is below the appropriate grade. It is derived as the difference between a child's current age, the highest grade attained in years and the age of 6 (the recommended age of starting primary school in Uganda). Furthermore, we investigate whether the impacts of orphan status on schooling outcomes differ by household welfare status by including an interaction term for orphan status and an indicator of household welfare status[5]. We find that parental death from HIV/AIDS has no significant effect enrolment of the combined group (6-17 years). However, for the age group 13-17 years, we find that HIV/AIDS orphans are less likely to continue schooling compared to non HIV/AIDS orphans and the gap decreases at higher levels of household welfare status. We obtain nearly similar results even with our second indicator of schooling outcome—the number of years below an appropriate grade. Our results suggests that HIV/AIDS orphans may be withdrawn from school to look after other ailing parents but later rejoin schooling.

[5] Previous multi-country studies such as Ainsworth and Filmer (2006) and Case et.al (2004) point to fact that orphans may be taken up by relatively well-to-do families.

This study is organised as follows. The next section reviews the literature on effects of parental deaths in developing countries, and provides further justification for an explicit focus on HIV/AIDS orphans in Uganda. Section three describes the analytical framework employed, while the subsequent sub-section, describes the data used. Section four presents the main results of the impacts of HIV/AIDS parental deaths on children's schooling status. Finally, section five provides a summary of the implications of our study findings.

2.0 Literature Review

The increasing prime-age mortality in sub-Saharan Africa has spurred a wealth of studies examining the effects of the orphan status on children's human capital outcomes in the sub-Saharan Africa[6]. The relationship between orphanhood and schooling status has dominated the literature with very little focus on other dimensions of human capital such as nutritional status. Although some of the studies confirm that orphans are disadvantaged with respect to schooling (see e.g. Evans and Miguel, 2007; Ainsworth et al. 2005; and Case et al. 2004), the empirical evidence is far from conclusive. Ainsworth and Filmer (2006), for example, based on survey data from 51 developing countries find no significant differences in the schooling enrolment of orphans and other children. In an earlier study based on a panel dataset that surveyed Ugandan households in 1992 and 1999, Deininger et al. (2003) find that the orphan disadvantage with respect to schooling that existed in 1992 was eliminated by 1999 with the introduction of the universal primary education (UPE) program. The majority of studies that find no significant results argue that differences in school enrolments between schooling participation of orphans and non-orphans are driven by poverty and not orphan status per se.

On the other hand, some studies find evidence of adverse impacts of orphanhood on schooling participation. Based on a survey of 970 households in Uganda, Yamano et al. (2006) find that the only female adolescent orphans experience lower school enrolment compared to other children. Using a five year panel of school children from 75 schools in Western Kenya, Evans and Miguel (2007) find that orphans are

[6] Examples of empirical studies in the recent past include Evan and Miguel (2007);Yamano et al. (2006), Ainsworth and Filmer (2006), Ainsworth et al. (2005); Nyamukapa and Gregson (2005); Gertler et al. (2004); Deininger et al. (2003); Bicego et al. 2003; Case et al. (2004).

about 5% less likely to attend school compared to other children. Other studies find evidence of orphan's delayed enrolment in school (Ainsworth et al. 2005); lower school attendance of orphans compared to other children living with orphans (Case et al. 2004); and higher likelihood of orphans being at a lower than appropriate grade for age (Bicego et al. 2003). Evidence of significant impacts seems rather dependent on the methodology used for estimation. A majority of studies that find significant impacts are based on longitudinal data sets that have the advantage of controlling for pre-orphan characteristics of children.

Furthermore, a number of studies find differential impacts of parental death on schooling outcomes according to the type of orphan status i.e. paternal, maternal or double orphan. Evidence from SSA indicates that maternal orphans suffer more with regard to decline in human capital outcomes. The study by Evans and Miguel (2007) finds that the maternal orphan effects on school enrolment are more than twice those of paternal orphans. Also, Case and Ardington (2006) based on panel data from Kwazulu-Natal in South Africa show that households with maternal orphans on average spend much less on schooling expenses compared to households with children where mothers are alive. Other studies that find adverse impacts of maternal orphanhood include Nyamukapa and Gregson (2005) in Zimbabwe, and Ueyama (2007) in Malawi. On the other hand, Ainsworth and Filmer (2006) conclude that it is not either paternal or maternal orphans that are disadvantaged with respect to schooling, but double orphans.

As earlier mentioned, only a few studies have examined the relationship between orphanhood and health status (See e.g. Siaens et al. 2003, Deininger et al, 2003; Lindblade et al. 2003; and Mishra et al. 2005)[7]. Siaens et al (2003) based on the 2000/2001 national household survey of Rwanda finds that orphans are disadvantaged with respect to access to health care and also exhibit the worst measures of long term health status. For instance, only 15 % of double orphans have received a BCG vaccine by the age of 5 years while the rate for children with both parents is more than double at 37%. Regarding long term health status, the stunting rate of double orphans is 40% compared to only 26 % for children with both

[7] This is because the predominant source of orphan data—the household surveys, rarely collect health status information such children's anthropometric indicators due to cost considerations.

parents. A recent study by Mirshra et al (2005) based on demographic and health data from Kenya also finds that fostered children are more likely to be stunted than other children. A major drawback for most of the orphan-health status studies is that their only compare the health status of orphans and non-orphans with no attempt to control for other factors that may affect this relationship.

As earlier mentioned, due to Uganda's long history with HIV/AIDS, a number of studies have also investigated the impact of orphan status on children's human capital outcomes (See e.g. Yamano et al., 2006; Deininger et al., 2003; and Ntozi, 1997). Similar to the wider SSA literature, the studies on Uganda have focused more on the orphan- school participation relationship albeit with mixed results. While Deininger et.al (2003) find no effect of foster status on school participation; Yamano et.al. (2006) on the other hand only find significant effects of orphan status on school participation of adolescents, especially girls.

Notwithstanding the wealth of studies on orphanhood and human capital outcomes in Uganda, we examine related issues although in a different way. Deininger et al. (2003) and Yamano et al. (2006) are the works most closely related to this study, but we do undertake a number of improvements. Unlike the above studies, we use a more nationally representative household survey and also explicitly identify orphans due HIV/AIDS. For example, Deininger et al. (2003) utilised panel data of 1,300 households surveyed in 1992 and 1999 and compare the enrolment rates of foster children to other children. Although the 1992-99 panel dataset was nationally representative, this particular study relied on foster children. As such, the failure to identify actual orphans (since the question was not asked in 1992) limits the utility of the study findings. Evidence from Demographic and Health Surveys indicates that a significant proportion of foster children's parents are still alive (Evans and Miguel, 2007). Similarly, the study by Yamano and others is based on a small sample—they covered only 29 of 55 districts in Uganda in 2003. We utilise a relatively larger survey and consequently, this permits more representative estimates of the impact of

parental death either from HIV/AIDS or other causes on children's education outcomes[8].

Finally, rather than compare the schooling of HIV/AIDS orphans to non-orphans, we include interaction terms with various categories of orphan status—to investigate whether impacts differ the child's status on the income distribution. Previous works show that failure to account for household poverty status can result to insignificant results for impacts of covariates on the use of social services (Glick et.al, 2004). In addition, we consider the effect of HIV/AIDS orphan status on another education indicator—the schooling gap. Previous research such as Sssewanyana et al. (2006) shows that children in school in Northern Uganda are significantly below their appropriate grade—either due to late enrolment or dropping out and re-entering school. Consequently, it is important to know how the absence of at least one parent may affect the timing of joining or continuing in school.

3.0 Methodology

In order to estimate the impact of orphan status on school enrolment, we follow the approach by Glick et.al (2004) and estimate models for determinants of school enrolment where different categories orphan status are included as independent variables. For the school enrolment outcome, we estimate a probit model for current school enrolment specified as:

(1) $\Pr(E_{ij} = 1) = \Phi(\beta' X_i)$

where E_{ij} represents enrolment into school for a child, Φ represents a standard normal cumulative distribution, β' represents parameters to be estimated while X_i are covariates that influence school attendance including orphan status. In order to more accurately interpret the results from the probit estimations, we estimate marginal effects of the specification in Eq (1). The marginal effects model is specified as:

[8] Another improvement of the present study is the consideration of households both in rural and urban areas. Yamano and others only cover rural areas. As shown in Table 1, the rate of orphanhood in urban areas is much higher than that of rural areas and this is mainly attributed to relatively higher HIV/AIDS prevalence in urban areas and consequently associated prime age mortality (GoU, 2006a). Thus, any work that omits urban orphans seriously underestimates the orphan problem in Uganda.

(2) $$\frac{\partial[\Phi(\beta' X_j)]}{\partial X_{ij}} = \phi(\beta' X_i)\beta_j$$

The interpretation for the estimations from Eq (2) is as follows—it measures the impact of change in the regressor at the mean on school enrolment.

On the other hand, for the determinants of the number of years below the appropriate grade, we estimate ordinary least squares (OLS) models specified as follows:

(3) $$Sc\_Gap_{ij} = \alpha' X_{ij}$$

The X_{ij} in all the above specifications capture variables relating to a child's own characteristics, those of its households as well as the community in which the child resides. As earlier mentioned, HIV/AIDS orphan status or any other category of childhood vulnerability is hypothesized to be among the major constraints to child schooling.

4.0 Data sources

We use the 2002/3 Uganda National Household Surveys conducted by the Uganda Bureau of Statistics. This is a multi purpose modelled along the lines of the World Bank's Living Standards Measurement Surveys (LSMS), whose key objective was to track trends in household welfare status. The survey is nationally representative covering 9,711 households[9]. Furthermore, the survey is based on a two-stage simple random sampling design. In the first stage, the Enumeration Area (EA) is the principal sampling unit and at the second stage, 10 households are randomly selected from each EA. The socio-economic modules of the surveys capture information on household demographics, welfare status, housing conditions as well as schooling and health information. On the other hand, the community module captures availability and access to social services in the locality.

[9] This particular survey comprehensively covers all the districts previously omitted in earlier UNHS surveys with the exception of Gulu district.

With regard to parental death, the 2002/03 survey inquires whether the mother and father are alive for all children below 18 years. Furthermore, for all children below 18 years who have lost at least one parent, the survey inquires whether the parental death is specifically due to HIV/AIDS. As earlier mentioned, this is the only UNHS survey where this particular question is asked. Table 2 provides a profile of the estimated number of orphan by the three categories—paternal, maternal and double HIV/AIDS orphans[10]. From the table, it is indicated that about 4% of all children in Ugandan below 18 years are HIV/AIDS orphans and the majority of HIV/AIDS orphans have actually lost both parents. Nonetheless, HIV/AID orphans only make up about 30% of the total orphan population (from tables 1 and 2).

At the spatial level, HIV/AIDS orphans are predominant in urban than rural areas (6.1% vs. 3.6%). On the other hand, at the regional level, Central Uganda accounts for the largest proportion of orphans—at least 6.3% of the children in the region are estimated to be HIV/AIDS orphans. In terms of actual numbers, we estimate that the total population HIV/AIDS orphans was about 600,000 children in 2002/03 and more than half of these are double orphans[11]. Due to the relatively lower reported HIV/AIDS orphan rates among the general orphan population, in the estimations, we do not disaggregate further HIV/AID orphans into sub categories such as paternal, maternal or double orphans. Rather, the further disaggregation is for the whole orphan sample—regardless of the cause of parental death.

4.2 Variables used in the analysis

a) Indicator of Orphan status

Regarding the main variable of interest, the 2002/03 survey inquires about the survival of both parents from all individuals in the households[12]. We define an HIV/AIDS orphan as any child below 18 years who has lost at least one parent and who reports that the cause of death was HIV/AIDS. Although reported HIV/AID orphans are a relatively smaller sample of the whole population as alluded to earlier,

[10] Paternal orphans are those that have lost only the father; maternal orphans have only lost their mother while double orphans have lost both parents to HIV/AIDS.

[11] The figures are considerably much lower than those quoted in the various UNICEF and UNAIDS reports and the difference may be explained that the UNAIDS estimates are best on models of estimated infection and deaths unlike our estimates best on household responses.

[12] In this particular survey, the five options considered are: “father and mother alive”, “only father alive”, “only mother alive”, “none alive” and “don’t know”.

there are important reasons for focusing HIV/AIDS orphans and not other orphans. First, as earlier mentioned, parental deaths from HIV/AIDS is traumatising given that some children are able to see their parents suffering for an extended period of time and consequently may be psychologically affected which in turn may affect their human capital outcomes. Second, and most important, this study was undertaken under a collaborative research project investigating the impacts of HIV/AIDS on the Ugandan economy; therefore retaining our focus on HIV/AIDS orphans can aid the comparison of the various impacts of HIV/AIDS on other dimensions of welfare status. Nonetheless, we do compare the schooling outcomes of HIV/AIDS orphans to other categories of vulnerable children as this may matter for policy.

(b) Indicators of Schooling

Regarding education, the survey captures information on children's current schooling status as well as education attainment (highest grade attained). Consequently, our first indicator of schooling is current enrolment for children aged 6-17 years and this serve as our main anchor for school participation for both HIV/AIDS orphans and other children[13]. The second indicator is the schooling gap i.e. the number of years a child is below an appropriate grade. Consequently, the impact of HIV/AIDS as well as other orphan states on education outcomes of children is investigated via (i) the differences between enrolment rates of HIV/AIDS orphans and other children and also among orphans, and (ii) the difference in the schooling gap between HIV/AIDS orphans and other children and similarly among orphans as a sub category of children.

(c) Household income

In line with other studies analysing socio-behavioural outcomes in developing countries, consumption expenditure is used as the measure of household welfare. Although the 2002/03 survey captures both income and consumption, consumption expenditures were preferred due to the fact that expenditures are more stable than income—which fluctuates from year to year. In addition, Uganda being a predominantly agricultural country, the likelihood of understating income is high. Thus, consumption expenditures adjusted for intra-household inequalities

[13] The empirical analysis is carried out for both the combined group (all children aged 6-17 years) as well as separately for the 6-12 years and 13-17 years groups.

(household age and composition effects) using adult equivalence scales, are our measure of household socio-economic status. In all the estimations, the variable for consumption per adult equivalent is interacted with the various categories of orphan status to establish whether orphan impacts differ according to the household's status on the welfare distribution.

(d) Other Control Variables

In order to capture the child's own demographic characteristics, the following variables were included: the gender of the child, an indicator of whether the child is the oldest son or daughter, and the number of siblings in the household. The household characteristics include: the total household size, gender of the household head, and non-income measures of household welfare status such as the education attainment of the household head. We also include community characteristics in particular relating to: distance to nearest public primary school, presence of a large employer within 10kms of the village centre, and the presence on an output market in the community. Furthermore, we also account for resources at the nearest public school. These include: the school fees charged (both official fees and contributions through parent teacher associations), the share of teachers with formal qualifications, and conditions of the school buildings. Finally, we account for the spatial location of children by including the regional dummies[14]. In Table 3, we provide the means of the variables used in the analysis. From the means, it appears that on average HIV/AIDS orphans reside in households of relatively higher socioeconomic status.

4.3 Other issues in estimation.

We estimate both combined models for school enrolments and the schooling gap as well as separate models for the primary schooling age category (6-12 years) and secondary schooling age category (13-17 years). In addition, we consider each category of orphan status separately. For example, in order to estimate the impact of HIV/AIDS orphan status on enrolment; we first include a dummy for HIV/AIDS orphan status in the probit model and thereafter in another model, an interaction

[14] We experimented with a number of demographic variables such as number of female adults in the household and the proportion of females among children; however, due to multicollinearity concerns, these particular variables were dropped. Other variables dropped on similar grounds included: household landholding, education attainment of females in the household, and access to electricity in the community.

term of HIV/AID orphan status and household consumption. As such, we estimate two models for each of the following orphan categories: (1) HIV/AIDS orphans, (2) all orphans regardless of cause of parental death, (3) paternal orphans, (4) maternal orphans, and (5) double orphans.

5.0 Results

Rates of HIV/AIDS orphanhood

As a precursor to the empirical analysis, we present descriptive statistics on the rate of HIV/AIDS orphanhood and school enrolments of children. Figure 1 shows that rates of HIV/AIDS orphanhood by age. The figure indicates that although all orphan rates increase with age, the rate of increase in much higher for paternal orphans. For example, while 6% of all children aged 1 year have lost their father, by the age of 17 years, the paternal orphan rate is about 19%. On the other hand, rates of HIV/AIDS orphans and that of the related category (double orphans) rise much slower—from about 2% at the age of 1 and peak at about 7% by the age of 17 years.

School enrolment

In terms of school enrolments, we concentrate on two indicators—the Net and Gross Enrolment Rates for the primary school age category (6-12 years) and the secondary school category 13-17 years[15]. Table 4 shows the NER and GER for primary schooling in Uganda during 2002/03 and the rates are disaggregated by orphan as well as welfare status. It is indicated that nationally, the primary NER was 86% with no significant differences between males and female children. Furthermore, the table shows that there are no major differences in the primary NERs between HIV/ADS orphans and other children. As highlighted by previous research, the results can be attributed to the UPE programme introduced by the government of Uganda in 1997 (Deininger, 2003).

[15] For primary schooling, we define the Net Enrolment Rate (NER) as ratio of the number of children aged 6-12 years who are enrolled in primary school to the total number of children aged 6-12 years (children who are supposed to be in primary school. On the other hand, we define Gross Enrolment Rates (GER) as the ratio of children enrolled in primary school regardless age to the total number of children who are supposed to be in primary school (age 6-12 years). Similar definitions obtain for the secondary school age category—(13-17 years).

However, there are significant differences in NERs across the welfare distribution. In particular, the primary NERs for the poorest quintile are in all cases (both male and female children) lower than those of other quintiles. Furthermore among HIV/AIDS orphans, there are significant gender differences in NERs among children from the bottom quintile. Specifically, the NERs for males are 84% compared to 73% for females. Overall, although children from the bottom quintile appear worse off in terms of enrolment, the magnitude do not seem very large and indeed the results may point to issues of late enrolment into school among poor children.

Indeed, the lower portion of Table 4 actually confirms that there is significant late enrolment across the spectrum of children considered. In particular, the national GER is 125 and this indicates that in 2002/03 about 25% of children in primary school were out of the recommended age range of 6-12 years. Furthermore, the primary GERs differ significantly by gender. Specifically, males are more likely to enrol into primary school out of the recommended age range compared to females. Also, across the welfare distribution, the GER reduces with an improvement in household welfare status as measured by per capita adult consumption quintiles. Finally, the primary GERs of HIV/AIDS orphans are significantly different from orphans of other causes as well as or non-orphans.

Unlike the relatively higher primary NERs, the corresponding secondary NERs are much lower (Table 5). In particular, the NERs for children 13-17 years are only 22% and again the tests for the difference in means by gender across the various categories of children are not significant. Also worth noting is the fact that orphans (both due to HIV/AIDS and other reasons) exhibits higher rates of secondary enrolment compared to non-orphans. This particular result may point to the fact that orphans are often taken up by households of relatively higher welfare standing than compared to the orphan's own parents. Indeed, evidence from other developing countries show that it is always the well to do families that accept responsibility of fostering other children (Evan and Miguel, 2006; Gertler et al 2004).

Furthermore, Table 5 shows that there is gross inequity in secondary enrolment. In particular, the ratio of net secondary enrolment of the richest to the poorest students

is 9.6 (46.9 over 4.9) and the trend is similar for both HIV/AIDS orphans and other children. In comparison to both sub-Saharan Africa (SSA) and other developing countries, Uganda's secondary enrolment rates also remain low. According to the Education For All 2005/6 Global Monitoring Report, the secondary enrolment rate for SSA was 28.4 in 2002/3 while the developing countries average was nearly double at 58.3 (UNESCO, 2006). Overall, the above results show that inequality in secondary schools is more widespread than in primary schools, in the sense that more children are disadvantaged in relation to the richest 20 % of the households.

The lower panel of Table 5 shows that the secondary GERs are considerably much higher and this suggests that children—both HIV/AIDS orphans and other children join the appropriate school grades much later. Overall, the results for the secondary NERs suggests that either only a few primary school graduates are able to join and stay in secondary school or that, like in the previous case, children join secondary school out of the recommended age. The former factor may carry more weight given previous evidence showing a high school drop our rate in primary school (GoU, 2006c) coupled with limited transition to secondary school.

In order to investigate further whether children join school late or whether their drop and re-enter school, we examine the schooling gap. Figure 2 plots the average schooling gap in years by current age status among: HIV/AIDS orphans, orphans due to other causes and non-orphans. It is indicated that up to the age of 18 years, the line graphs for HIV/AIDS orphans is all points lower than that of either other orphans or non-orphans. On average, by the age of 18 years, children currently in school are 3.5 years below their appropriate grade.

Overall, the descriptive statistics suggest that HIV/AIDS orphans are in no way worse off, in terms of school participation, compared to other children. However, mere descriptive statistics does not establish causality. It is important to control for other factor that may affect the schooling outcomes of children affected by parental death. Consequently, we examine differences in enrolments and schooling gaps between orphans and other children through estimation of the models specified in section 3.

Regression Results

In Table 6, we present the marginal effects results for school enrolment. Since we are mainly interested in the effects of orphan status, and the fact that the rest of the other covariates are similar in all the probit models, we only show results for the particular orphan indicator[16]. For the combined category (6-17 years), column (1) reports the results for the HIV/AIDS orphan and it is indicated that being an HIV/AID orphan is positively associated with enrolment however; the results in this particular case are not significant. In column (2), the indicator for HIV/AIDS orphan status is interacted with household consumption. Although the signs change—indicating that HIV/AIDS orphans are less likely to be enrolled, the results remain insignificant—at even the 10% level of confidence.

In column (3), we now consider the impact of orphan status (regardless of cause of parental death) on school enrolment. Again, the indicator shows that being an orphan has no significant impact on school enrolment. However, when we take into account the welfare status of the child (column 4), we find that on average orphans are about 30% less likely to enrol in school and the differences in enrolment between orphans and other children reduces as one moves up the household welfare distribution. Further analysis by sub category of orphan status (presented in columns 5 to 10) reveals that it is the results for paternal orphans that are driving the above impacts. In particular, paternal orphans are significantly less likely to continue schooling compared to either maternal or double orphans. Overall, our results suggest that the type of parental death (in terms of which of the two parents passes away first) matters more than the actual cause of parental death.

The above results may be explained by the fact Uganda is a patrilineal society—where the man remains the most important income earner and consequently, paternal death may result in more adverse consequence on children—this is particularly true in developing with poorly developed credit markets[17]. Given the fact that at the time of the survey, at least the UPE policy was operational across Uganda, the significance of paternal orphanhood and its relation to household

[16] The detailed results are available from the authors.
[17] In this case, the surviving parent can not borrow and continue financing a child's education.

income suggest that children continue to face other schooling costs even in the era of free primary education. On the other hand, as indicated in our descriptive results, majority of HIV/AIDS orphans are double orphans, but our analysis relating to double orphan status (column 10) indicates that double orphans are on average not worse off with regard to schooling. As mentioned earlier, results from cross country studies in SSA suggest that orphans are more likely to be taken up by relatively well to do households (Ainsworth and Filmer, 2006; Case et.al, 2004).

Do the impacts of orphan status differ by a child's schooling age category? More specifically, are orphans in the primary school age category (6-12 years)—where free education exits more likely to enrolled than their counterparts in the secondary school age category (13-17 years)?[18] Indeed, the results from the bottom two panels of table 6 show that the school age category does—HIV/AIDS and maternal orphans are significantly less likely to continue schooling for the 13-17 years school category. HIV/AIDS orphans aged 13-17 years are 57 % less like to be enrolled in school although the effect is only weakly significant –at the 10% level. On the other hand, maternal orphans are 55% less likely to be in school for the 13-17 year school age category.

Two reasons can be advanced for the difference in impacts on enrolment across age categories. First, as highlighted by Deininger (2003) and Yamano et al. (2006), the UPE program—which targets the age category 6-12 years may have successfully addressed the income constraints to school enrolment. Secondly, the significant impacts for the 13- 17 years age category may be explained by the HIV/AIDS gestation period—from infection to deaths. According to UNAIDS (2004) the average duration from infection to death is about 10 years; consequently for the 6-12 years age range, at least one of the parents may be still surviving where as by the time the children make their 17th birth day, it is mostly certainly than not that both parents are dead.

[18] In 2002/03, there was no free secondary in Uganda however at the start of 2007; the Government initiated the Universal Secondary Education (USE) scheme. At the time of undertaking this research, it was not possible to investigate what impact USE may have on enrolment for the 13-17 year age category due to data constraints.

Apart from the possibility that orphans may be taken up by relatively well to do households, it is also possible that they drop out of school—prior or immediately after parental death but later rejoin school. This is particularly plausible for HIV/AIDS orphans if children have to live school and look after ailing parents. If this is the case, then HIV/AIDS orphans will fall much lower below the appropriate age compared to other children. Consequently, we examine this issue by estimating OLS regressions for determinants of the schooling gap years. Similar to our enrolment estimations, we interact orphan status with household consumption expenditures—to examine whether the orphan impacts on the schooling gap differ by welfare status.

Table 7 reports the results for the determinants of the schooling gap and the first panel shows the results for the combined age categories (6-17 years). Unlike in the case of school enrolment, column (2) in this particular case shows that HIV/AIDS orphans are on average about 3 years below their appropriate grade. Also, the significance of the interaction term indicates that number of years below the appropriate grade increases at lower levels of household welfare status—poor HIV/AIDS orphans are more likely to fall below their appropriate grade. Even more important, in the schooling gap estimations, all the various categories of orphan status show significant impacts—with average falls below appropriate grade of about 2.5 years. Similar to the case of school enrolments, the schooling gap impacts significantly differ by schooling age categories (the bottom two panels of table 7). While orphans aged 6-12 years are on average 1.3 years below their appropriate grade, the average gap is more than double at 3.6 years for the 13-17 years school age category. Worse still, among children in the 13-17 year age category, the magnitude of the gaps are highest for HIV/AIDS and paternal orphans—on average orphans from the above two categories are about 4 years below their appropriate grade.

In summary, our results from table 6 show that paternal orphans are less likely to enrol and continue school; however, our results from table 7 show that orphan status adversely affects schooling gaps—regardless of category of orphanhood. Thus, orphans are more likely to missing out on school for a significant number of years than completely drop out of school. More specific to the issue of HIV/AIDS, our results show that although HIV/AIDS orphan status has minimal impacts on school

enrolments, it nevertheless has far reaching impacts on appropriate grade attainment. Unfortunately, due to data limitations, we are unable to investigate further the direct ways through which parental death from HIV/AIDS or any other cause impacts on: delayed school enrolment; school drop out and re-entry or grade repetition—the main principal causes of the school gap[19].

6.0 Conclusion and Implications

This study investigates the impact of HIV/AIDS orphan status on two schooling outcomes—school enrolment and the schooling gap. In addition, we examine the impacts across two age categories—6-12 years (primary school going age category) and the 13-17 years (secondary school going age category). We find that HIV/AIDS parental death impacts most on the schooling gap as opposed to actual school enrolment. For the whole category of orphans, we find that there are less likely to continue school and the effects are much worse for children from poor households. Furthermore, the larger impacts on the schooling gap on the 13-17 year age category suggests, the effects of parental loss may be cumulative. Consequently, national policies that address the challenge of school drop-outs have the potential to address vulnerabilities with respect to HIV/AIDS orphans joining or continuing school.

On the other hand, targeting HIV/AIDS orphans or any other orphans presents ethical dilemmas. Our results show that all orphan children (regardless of the cause of parental death) and especially from the poorest households are disadvantaged with respect to school enrolment. On the other hand, HIV/AIDS orphans as a specific group are significantly not less likely to continue schooling. Furthermore, a substantial proportion of poor children are out of school albeit with both parents alive. Consequently, if only HIV/AIDS orphans or children who have lost at least one parent are offered support, the largest proportion children would still be out of school,

[19] Despite the presence of the policy of "automatic promotion", repetition is also still rampant in primary schools. According to the 2006 Education statistical abstract, at least 13% of children enrolled in primary school were repeaters and this reflects another enormous wastage of resources. On the other hand, repetition rates in secondary schooling are much less pronounced than those for primary schools—only 2% of students enrolled in secondary school are repeaters.

especially secondary school. However, a national program—the Community-led HIV/AIDS Initiative (CHAI) component under the Northern Uganda Social Action Fund (NASAF) experimented with supporting orphans to attend secondary school in 8 districts of Northern Uganda. In this particular case, communities affected by HIV/AIDS selected the most deserving orphans for whom the project paid school dues. Over a period of 4 years, only 1,677 or about 7 % of the total number of orphans of secondary school going age in the 8 districts had been supported (Uganda AIDS Commission, 2007). Thus, replication of such programs requires not only a large amount of resources but also must recognise the local settings. Communities in Northern Uganda were able to register some success with the CHAI program due to their stronger socio-cultural ties. In other parts of the country where community ties are not that cohesive, identification of beneficiaries would be problematic due to concerns of elite capture of national programs. Consequently, it is national programs (of the scale of USE) which do not discriminate children based on the cause of their vulnerabilities, are likely to succeed in increasing enrolment in secondary school.

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Figure 1: Rates of Orphanhood by Age, 2002/03 (%)

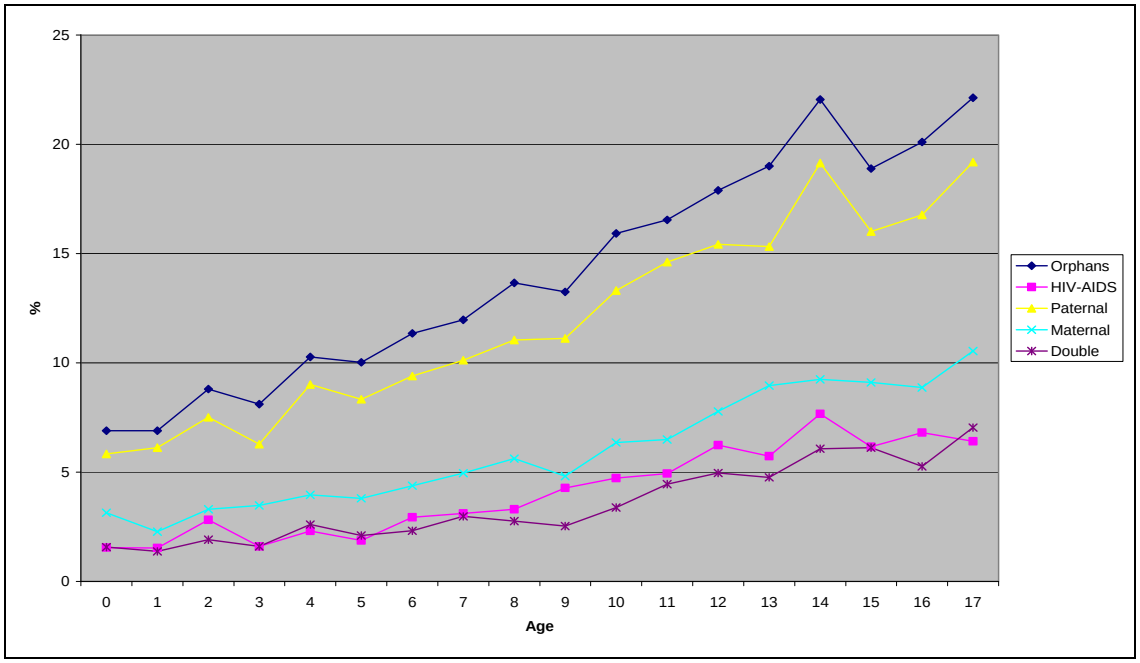

Figure 2: Schooling Gap among 6-25 years old currently in school.

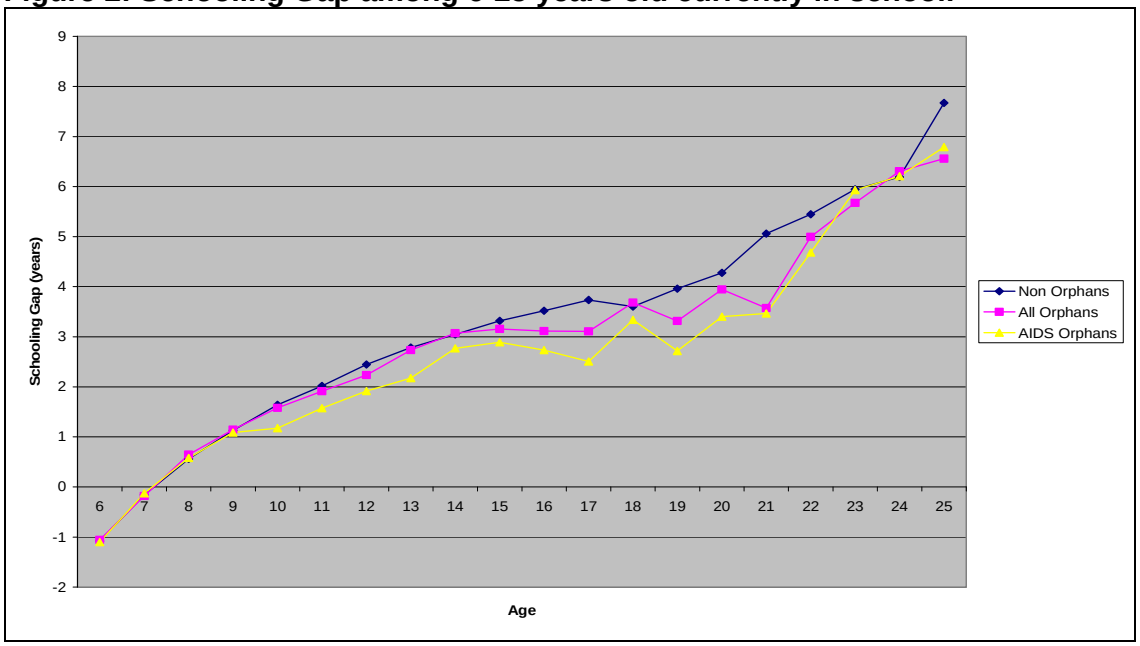

Table 1: Uganda, Proportion and number of children who have lost at least parent, 1996/97-2002/3

	Survey Year								
	1996/97			1999/2000			2002/3		
	All	Location		All	Location		All	Location	
		Rural	Urban		Rural	Urban		Rural	Urban
Orphans as % of children <18 years	14.4	14.2	15.9	14.7	14.7	17	13.6	12.9	19
Percentage of which									
Paternal Orphans	8.7	8.6	9.1	8.5	8.3	9.7	8.1	7.7	11.2
Maternal Orphans	2.8	2.8	2.3	2.9	3	2.9	2.2	2	3.4
Double Orphans	2.9	2.8	4.5	3.2	3.1	4.4	3.3	3.1	4.3
Number of orphans	1,753,546			1,831,513			2,071,997		

Source: Author's calculations from 1996/7, 1999/00 and 2002/2003 household surveys

Table 2: Profile of HIV/AIDS Orphans in Uganda, 2002/3

	*Rate of HIV/AIDS Orphanhood (%)				Number of AIDS Orphans			
	All AIDS	Type of orphan status			All AIDS	Type of orphan status		
		Paternal	Maternal	Double		Paternal	Maternal	Double
Uganda	3.93	1.44	0.51	1.99	597,620	218,469	76,972	302,179
Rural	3.63	1.31	0.47	1.86	484,408	174,360	62,029	248,019
Urban	6.07	2.36	0.80	2.90	113,212	44,109	14,943	54,160
Central	6.32	2.69	0.76	2.87	280,948	119,352	33,864	127,732
Eastern	2.52	0.97	0.64	0.91	106,694	41,220	27,022	38,452
Northern	2.35	0.72	0.08	1.55	66,167	20,325	2,320	43,522
Western	3.88	1.01	0.37	2.50	143,811	37,572	13,766	92,473

Source: Author's calculations from the 2002/03 UNHS survey

Notes: * Rate of orphanhood refers to HIV/AIDS orphans as a proportion of all children less than 18 years

Table 3: Mean Household Characteristics of the Sample

	All	Household without HIV/AIDS orphans	Household with HIV/AIDS orphans
Demographics			
Household size	6.9	6.6	8.8
No of children	4.5	4.2	5.9
No of non orphan children	2.8	2.5	3.9
No of orphans	2.8	-	4.2
No of aids orphans	1.2		3.2
Household Head			
Age of household head	41	40.2	48.2
Female household head	22.30%	17.40%	37.60%
No of female adults	1.5	1.3	1.9
No of female elders	1.1	1	1.1
Average years of education	6.1	6.3	5.8
Housing conditions			
No of sleeping rooms	2.3	2.2	2.8
Roof Quality	66.40%	65.30%	86.20%
Floor Quality	26.20%	25.20%	39.60%
Wall Quality	35.50%	34.80%	46.20%
Access to safe water	55.10%	53.40%	56.20%
Access to a toilet	54.20%	52.90%	67.30%
Electricity	8.50%	7.60%	14.80%
Proportion Poor (%)	38.1	39.5	27.2

Source: Author's calcultaions from the 2002/03 UNHS

Table 4: Uganda Primary Enrollment Rates by Orphan Status (6-12 years), 2002/03

	All	Per capita Consumption Quintile				
		1	2	3	4	5
			Net Enrollment Rates			
All Children	85.9	79.1	85	87.4	90.1	90.9
Male	85.5	78.3	86.3	86.6	88.4	91.1
Female	86.3	79.9	83.7	88.2	91.6	90.7
Non Orphan	85.5	79.5	84.9	87.6	90.1	89.9
Male	84.9	78.2	86.3	86.4	88.6	89.1
Female	86.3	80.9	83.5	88.5	91.4	90.8
Orphan	88	82.6	86.3	89.1	89.9	94.3
Male	89.1	82.3	91.2	87.5	89	94.2
Female	87.3	82.8	82.8	90.6	90.9	90.9
HIV/AIDS Orphan	87.7	77.6	83.2	89.9	89.7	94.6
Male	88.3	84.3	86.8	85.9	94.4	95.4
Female	87.5	73.2	80.7	93	85.6	91.1
			Gross Enrollment Rates			
All Children	125.2	119.9	126.8	129.8	127.1	122.6
Male	128.2	124.3	130.8	130.9	130.6	124.2
Female	122.3	115.1	122.9	128.9	124.1	121.3
Non Orphan	126.4	119.2	128.9	129.6	133	123.1
Male	129.9	122.7	131.7	132.6	138.2	127.1
Female	124.7	117.3	128.6	128.9	128.9	120.5
Orphan	131.6	127.9	127.3	144.9	127.7	129.1
Male	138.2	140.4	136.8	147.9	133.4	130.1
Female	126.7	118.4	120.7	143.2	122.8	129.6
HIV/AIDS Orphan	129.3	136.9	110.4	147.1	122.3	124.9
Male	139.9	133.6	130.7	152.1	144.7	131.3
Female	120.9	141.9	96.7	143.3	102.5	119.9

Source: Author's calculation from the 2002/03 UNHS

Table 5: Uganda Secondary Enrollment Rates by Orphan Status (13-18 years), 2002/03

	All	Per capita Consumption Quintile				
		1	2	3	4	5
			Net Enrollment Rates			
All Children	22.1	4.9	14.6	23.4	30.7	46.9
Male	23.1	6.1	12.6	27.9	31.2	48.8
Female	21	3.3	16.5	18.8	30.2	45.3
Non Orphan	20.5	5.1	12.9	23.2	29.8	43.3
Male	20.8	6.6	11.1	28.8	31.6	42.5
Female	19.1	3.3	14.7	17.7	27.9	43.9
Orphan	24.5	4.9	19.8	25.1	29.9	49.3
Male	25.6	5.3	16.4	27.22	30	55.1
Female	23.6	4.4	22.8	22.9	29.9	44.7
HIV/AIDS Orphan	31.2	5.8	27.8	27.6	32.5	55.8
Male	31	7.3	29.1	30.9	29.8	56.4
Female	31.2	3.5	26.1	23.6	36.6	55.4
			Gross Enrollment Rates			
All Children	31.9	8.5	22.4	32.2	46.8	63.1
Male	35.4	11.3	23.6	38	50.1	69.5
Female	28.4	5.1	21.1	26.2	43.4	57.5
Non Orphan	28.2	7.4	19.5	32.8	43.1	56.7
Male	31	8.8	20.6	40.5	46.4	61.9
Female	25.2	5.6	18.4	25.2	39.6	52.3
Orphan	32.7	8.9	25.7	29.9	43.9	63.5
Male	36.2	12.3	25	32.8	47.1	70.7
Female	29.3	4.4	26.4	26.7	40.1	57.9
HIV/AIDS Orphan	41.6	5.7	33.9	31	49.5	78.3
Male	43.1	7.3	37.2	37.2	46.9	83.7
Female	39.9	3.5	29.5	23.8	53.4	74.6

Source: Author's calculation from the 2002/03 UNHS

Table 6: Estimates for Marginal Effects for determinants of School Enrolment

Dependent Variable Enrolment in school	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Age Category 6-17 years										
HIV/AIDS Orphan =1	0.015	-0.317								
	(1.53)	(-1.47)								
HIV/AIDS Orphan x Household Expenditures		0.022								
		(1.60)								
Orphan=1			0.0008	-0.2741						
			(0.15)	(-2.97)**						
Orphan x Household Expenditure				0.0202						
				(2.99)**						
Paternal Orphans=1					0.0038	-0.2739				
					(0.93)	(-2.67)**				
Paternal Orphans x Household Expenditures						0.0204				
						(2.76)***				
Maternal Orphans=1							0.0053	-0.7241		
							(0.65)	(-1.26)		
Maternal Orphans x Household Expenditures								0.0832		
								(1.31)		
Double Orphan=1									0.0235	0.029
									(2.38)**	(0.26)
Double Orphan x Household Expenditures										-0.0007
										(-.05)
R-Squared	0.16	0.18	0.16	0.17	0.16	0.16	0.16	0.16	0.17	0.16
Number of observations (N=18,111)										
Age Category 6-12 years										
HIV/AIDS Orphan =1	0.0157	-0.3484								
	(1.33)	(-.99)								
HIV/AIDS Orphan x Household Expenditures		0.0206								
		(1.09)								
Orphan=1			0.0077	-0.3439						
			(1.17)	(2.33)**						
Orphan x Household Expenditure				0.0213						
				(2.43)**						
Paternal Orphans=1					0.0042	-0.2875				
					(.58)	(-1.93)*				
Paternal Orphans x Household Expenditures						0.0182				
						(1.98)**				
Maternal Orphans=1						0.0165	-0.0191			
						(1.73)*	(-0.13)			
Maternal Orphans x Household Expenditures							0.0039			
							(0.27)			
Double Orphan=1								0.0135	0.0664	
								(1.07)	(1.03)	
Double Orphan x Household Expenditures									-0.0163	
									(-0.94)	
R-Squared	0.19	0.19	0.18	0.2	0.17	0.19	0.18	0.18	0.19	
Number of observations (N=11,685)										
Age Category 13-17 years										
HIV/AIDS Orphan =1	0.0256	-0.5676								
	(1.51)	(-1.72)*								
HIV/AIDS Orphan x Household Expenditures		0.0433								
		(1.85)*								
Orphan=1			-0.0021	-0.4451						
			(-0.19)	(-2.98)***						
Orphan x Household Expenditure				0.0353						
				(2.96)***						
Paternal Orphans=1					0.015	-0.3856				
					(1.3)	(-2.3)**				
Paternal Orphans x Household Expenditures						0.0324				
						(2.43)**				
Maternal Orphans=1							-0.0013	-0.5489		
							(-0.09)	(-2.29)**		
Maternal Orphans x Household Expenditures								0.039		
								(2.28)**		
Double Orphan=1									0.0442	-0.1651
									(2.60)***	(-0.58)
Double Orphan x Household Expenditures										0.0196
										(0.80)
R-Squared	0.13	0.15	0.13	0.14	1.3	0.13	0.12	0.13	0.13	0.14
Number of observations (N=6,426)										

Notes: All estimations also include the following covariates, for the child: gender of the child, household size, number of the childs siblings, dummies for oldest son or daughter. Relating to the household, the following variables are included:, age of the household head (years), gender of the household head, dummies for education attainment of the household head (no schooling, some primary, completed primary, some secondary and completed secondary). Included community covariates are: distances to the nearest public primary school , the presence of a large employer within 10kms of the community, and presence of an ouput market. Inaddition, we include variables relating to nearest primary school: log of fees charged, log of schol size, share of teachers with formal qualification and conditions of the buildings of the school. Finally, we include dummies regional location

Table 7: OLS Estimates for Determinants of School Gap

Dependent Variable: Number of years a child is behind a recommended grade										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Age Category 6-17 years										
HIV/AIDS Orphan =1	-0.021	2.997								
	(-0.35)	(4.16)***								
HIV/AIDS Orphan x Household Expenditures		-0.329								
		(-4.20)***								
Orphan=1			0.133	2.452						
			(3.60)***	(6.48)***						
Orphan x Household Expenditure				-0.254						
				(6.15)**						
Paternal Orphans=1					0.1156	2.5166				
					(2.92)**	(6.24)***				
Paternal Orphans x Household Expenditures						-0.2639				
						(-5.99)***				
Maternal Orphans=1							0.0893	2.616		
							(1.74)	(4.14)**		
Maternal Orphans x Household Expenditures								-0.275		
								(3.99)***		
Double Orphan=1									0.0469	2.786
									(0.72)	(3.42)***
Double Orphan x Household Expenditures										-0.2991
										(3.38)**
Adjusted R-Squared	0.11	0.14	0.13	0.14	0.12	0.14	0.11	0.13	0.11	0.14
Number of observations (N=15,843)										
Age Category 6-12 years										
HIV/AIDS Orphan =1	-0.0314	1.841								
	(-0.53)	(2.45)**								
HIV/AIDS Orphan x Household Expenditures		-0.205								
		(-2.50)**								
Orphan=1			0.0466	1.361						
			(1.31)	(3.5)***						
Orphan x Household Expenditure				-0.1446						
				(-3.38)**						
Paternal Orphans=1					0.0216	1.171				
					(0.56)	(2.83)***				
Paternal Orphans x Household Expenditures						-0.127				
						(-2.79)***				
Maternal Orphans=1							0.023	1.857		
							(0.47)	(2.85)***		
Maternal Orphans x Household Expenditures								-0.2001		
								(-2.81)***		
Double Orphan=1									-0.0514	1.289
									(-0.78)	(1.54)
Double Orphan x Household Expenditures										-0.1468
										(-1.61)
Adjusted R-Squared	0.06	0.07	0.06	0.08	0.06	0.08	0.07	0.1	0.08	0.09
Number of observations (N=10,518)										
Age Category 13-17 years										
HIV/AIDS Orphan =1	-0.235	4.062								
	(-2.5)**	(3.82)***								
HIV/AIDS Orphan x Household Expenditures		-0.4659								
		(4.05)***								
Orphan=1			-0.0738	3.579						
			(1.23)	(6.27)***						
Orphan x Household Expenditure				-0.397						
				(6.42)***						
Paternal Orphans=1					-0.1106	3.9704				
					(1.74)*	(6.54)***				
Paternal Orphans x Household Expenditures						-0.4455				
						(-6.76)***				
Maternal Orphans=1							-0.0965	2.145		
							(1.18)	(2.27)**		
Maternal Orphans x Household Expenditures								-0.242		
								(-2.37)**		
Double Orphan=1									-0.182	2.8182
									(-1.8)*	(2.31)**
Double Orphan x Household Expenditures										-0.326
										(-2.47)**
Adjusted R-Squared	0.2	0.22	0.19	0.22	0.18	0.21	0.2	0.21	0.19	0.22
Number of observations (N=5323)										

Notes: All estimations also include the following covariates, for the child: gender of the child, household size, number of the childs siblings, dummies for oldest son or daughter. Relating to the household, the following variables are included:, age of the household head (years), gender of the household head, dummies for education attainment of the household head (no schooling, some primary, completed primary, some secondary and completed secondary). Included community covariates are: distances to the nearest public primary school , the presence of a large employer within 10kms of the community, and presence of an ouput market. Inaddition, we include variables relating to nearest primary school: log of fees charged, log of schol size, share of teachers with formal qualification and conditions of the buildings of the school. Finally, we include dummies for regional location

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