Reaching the last 10 percent out of school children: the role of AIDS

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Abstract

This paper investigates the role of AIDS on children being out of school. Put differently, whether it is because of AIDS that children are out of school. The main data source was the Northern Uganda Survey of 2004 conducted by Uganda Bureau of Statistics (UBOS) between July and December 2004. The survey was meant to provide indicators to guide the monitoring and evaluation function of the NUSAF project period in 18 districts of Northern Uganda. We defined and identified 'aids affected households', used descriptive analysis as well as a multinomial specification. We further explored the role of poverty using changes in household asset value between 1992 and 2004. There is no conclusive evidence that children are out of school due to AIDS. AIDS has a marginal effect on children failing to continue in school but this is not statistically significant. However there is strong evidence that children are out of school because of a decline in household asset value. To reach children who have never attended school, rather than focusing on 'AIDS affected households', a much greater impact is expected from preventing major decline in 'household asset value'.

Keywords: AIDS, Children, School, logit, Uganda

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1 Introduction

This paper investigates the role of AIDS (if any) as a determinant of children being out of school. Uganda like many other African countries implemented free primary education in 1997, following which net school enrolment increased from about 57 percent in 1995 to 87 percent in 1997 (Bategeka et al. 2004). The net enrolment is now estimated to be at 82 percent nationally (Uganda Bureau of Statistics and ORC Macro 2006). Despite this progress, there are about 15 to 20 percent and 5 to 10 percent children of school going age not in school and have never attended school respectively despite the efforts of free primary education. Who are these children?

Note worth that in countries where the AIDS epidemic has hit hard, including Uganda and many countries in sub-Saharan Africa, anecdotal evidence suggests that the epidemic is at least in part responsible for children being out of school (Human Rights Watch 2005). However, the extent to which this is the case is not entirely clear. In light of this the Inter Agency Task Team on children and HIV and AIDS during its second global partners' forum rallied around the need to remove financial barriers to education, and recognized that, while such initiatives are costly and require substantial and systematic support, they offer a proven and practical approach to securing the future for millions of orphans and vulnerable children – including those 'affected by HIV and AIDS' (IATT, 2004). This paper thus contributes to this debate by exploring the role of AIDS in affecting primary school attendance with emphasis on those primary school age children who have never gone to school.

Schooling and AIDS

Schooling is an investment by parents in the future productivity and earnings of their children. They thus, perceive education to impact on both their wellbeing and that of their children in the long run. Note that the factors affecting parents' decisions to send their children to school include the costs of schooling (fees and the opportunity cost of the child's time in other activities), the future benefits of schooling (including the quality of available schools and an assessment of labor market conditions), the parent's education attainment which affects they attitude towards education and the household's budget constraint.

It is imperative to note however, that heightened adult mortality due to AIDS may adversely affect household demand for schooling. First, the opportunity cost of the child's time may increase if he/she is needed to care for a terminally ill household member or substitute for the patient in economic activities, raising the cost of schooling. Second, households with terminally ill, prime-aged adults are likely to have reduced income and more medical and funeral bills, reducing their ability to pay for school fees, uniforms, or textbooks. Third, if other relatives or guardians do not receive the same satisfaction or benefits from investing in the schooling of a child that is not their own, then two-parent orphans may have lower attendance. Fourth, high adult mortality from AIDS may alter the scarcity of different kinds of labor (raising the wages of jobs in which there is insufficient manpower with ambiguous effects on the demand for schooling), as well as parents' calculations on the survival probability of their children into adulthood (unambiguously lowering schooling investments). Fifth, by raising the mortality of teachers resulting into teacher supply shortages, the epidemic may reduce the access to and

quality of schooling hence reducing demand. The schooling of both orphaned children and non-orphaned foster children in households with adult deaths can be disrupted, resulting in delayed enrolment or fewer hours at school once enrolled, and at worst drop-out.

AIDS affects children's schooling at the household level in at least two ways: children may be kept out of school if they are needed at home to care of sick family members or to work in the fields; and children may drop out of school if their families can not afford school fees due to reduced household income as a result of an AIDS death (Bollinger and Stover 1999). Removing children from school or interrupting their daily school attendance is one of the strategies to cope with ill health or death due to AIDS; this is attributed to the impoverishment that results when an adult member of the household gets ill or dies (Russell 2004). Coping strategies are a set of actions that aim to manage the costs of an event (shock) or process that threatens the welfare of some or all of the household members. Ultimately coping strategies are seeking to sustain the economic viability and sustainability of the household (Sauerborn et al. 1996). Coping strategies are important for poor households faced with AIDS, since the associated costs can absorb a large proportion of the household budget and therefore require the mobilization of substantial additional resources.

The concept of coping strategies has been applied to illness costs and the short- or long-term shocks they impose on the household economy (Goudge and Govender 2000; McIntyre and Thiede 2003; Russell 1996; Sauerborn et al. 1996). These studies divided the coping strategies into: (a) strategies to cope with the direct costs of illness: often adopted in sequence by households to minimize the risks to livelihood sustainability (for reviews see (Russell 1996; Goudge and Govender 2000) and most recently (McIntyre and Thiede 2003): using savings; pawning jewellery; borrowing or making claims from social networks; selling food stores; reducing consumption of non-essentials and then more essential items; diversifying income sources; selling unproductive assets; reducing investments (e.g. withdrawing a child from school); selling productive assets such as livestock, land or machinery; and (b) strategies to cope with the indirect costs of illness: the above strategies are also used to cope with indirect costs, but a particularly important strategy for coping with the loss of a worker is intra-household labor substitution (Sauerborn et al. 1996).

Household ability to cope, in terms of their access to strategies and the affordability and sustainability of these strategies McIntyre and Thiede (2003), is linked to two key factors: (a) its resilience based on household asset portfolios that include human, physical and financial assets, and intangible social resources. The latter are the social networks and local organizations such as funeral societies and savings groups that household members can draw on for information, moral support and financial help at times of illness; and (b) the type of illness: the severity and duration of illness will influence the level and duration of illness costs, thus determining the coping strategies that households adopt and their affordability or sustainability over the medium term (McIntyre and Thiede 2003).

For purposes of this study, there are four illness categories used to structure the analysis of removal or interrupting children's schooling as a coping strategy, namely; acute or moderate illnesses, recurring spells of illnesses such as malaria, permanent disability such as tuberculosis, terminal and steadily deteriorating health such as AIDS and in all cases death. Table 1

summarizes the categories of ill health of a household member on the likelihood of disruption to a child's schooling.

Table 1: Categories of the likelihood of a child's school disruption

Categories of ill health	Likelihood negative impact
Acute mild or moderate illnesses	-
Recurring spells of illness such as malaria	+
Permanent disability or chronic illness, such as tuberculosis	+++
Terminal and steadily deteriorating health, such as AIDS	+++
Death	+++

Key: - not likely, + minimal impact, +++ great impact

Acute mild or moderate illnesses

Common illness shocks that affect most households, particularly those with several young children, are frequently managed through relatively small scale borrowing or use of savings (Russell 2001). However they could severely shock households with few assets (Pryer 1989; Russell, 2001). They are therefore not likely to have a noticeable impact on children's schooling.

Recurring spells of illness such as malaria

Evidence from the malaria literature reports widespread use of intra-household labor substitution to cope with indirect costs and reliance on social networks or asset sales to cope with direct costs (Chima et al. 2003). The room for maneuver that households possess for labor substitution at times of malaria morbidity will crucially affect whether illness leads to loss of output or income. Chima et al (2003) suggest that in parts of sub-Saharan Africa, the potential for labor substitution within and between families might be quite high, but the empirical evidence on the extent of labor substitution and its impact on output is limited (Chima et al. 2003). Due to the use of labor substitution, children attending school may be withdrawn to work on the farms for days or even take care of patients at home.

Permanent disability or chronic illness, such as tuberculosis

With limited or no welfare safety nets, chronic conditions such as diabetes, hypertension and tuberculosis impose high costs over time if regular treatment is required and if the sick are recurrently incapacitated which often go well beyond a poor household's monthly budget and absorbing a large proportion of annual income. This is likely to affect children's schooling. Several studies have reported spending cutbacks on education for children, clothing, and "non-essentials" such as tobacco or alcohol (Kamolratanakul et al. 1999; Luhanga et al. 2001; Rajeswari and Balasubramanian 1999). In India, 11 percent of school children of parents with TB (n=276) discontinued their studies and an additional 8 percent took up employment to support their families. Girls are more likely to be withdrawn from school for these caring and domestic tasks (Nhlema and Kemp 2003; Mann et al. 2002; Nhlema et al. 2002). In Uganda an evaluation of the implications of TB costs for patients (n=32) and their families (Saunderson 1994) revealed that 21 out of 22 subsistence farmers had lost production because of their disease, 8 out of 10 workers had stopped working, two wives had been divorced since their illness and

several children had been withdrawn from school because of parents' inability to pay school fees.

Terminal and steadily deteriorating health, such as AIDS

The coping mechanisms identified in th literature (Bachmann and Booysen 2003; Bechu 1998; Knodel et al. 2001; Pitayanon et al. 1997; Tibaijuka 1997; World Bank 1997) include: (a) those that struggle with the direct costs of illness and smooth consumption levels: using savings and other stores; help from parents, extended family and other community actors; borrowing; sell unproductive then productive assets; cut food consumption; withdraw children from school to cut spending or increase labour supply; and (b) those designed to alleviate indirect costs or labour losses: adjust household composition; diversify income sources; take children from school to work; hire labor; grow different crops; decrease area cultivated; work longer hours. A series of household surveys conducted in the mid-1990s (Ainsworth et al. 1998; World Bank 1997) were a little more optimistic about household resilience and the sustainability of coping strategies. For example the survey in Cote d'Ivoire indicated a certain degree of household resilience, at least in the medium term, through recovery of consumption levels following an AIDS death (Bechu 1998), and the prevention of household collapse:

> "Survey data suggest that when it comes to coping with the economic impact of such a loss, households in general are surprisingly resilient" (World Bank, 1997).

Such tentative conclusions may have been a little optimistic. AIDS deaths may impose a larger burden than non-AIDS deaths on households because: (a) there is a high chance of multiple cases within the household; (b) stigma generates social exclusion; (c) often many households within a community are affected reducing community resilience and ability to cope (Pitayanon et al. 1997).

In general, as a consequence of illness costs and coping strategies, common impacts identified in the literature include: (a) reductions in income (Bachmann and Booysen, 2003); (b) reduced consumption of basic needs including food (Pitayanon et al., 1997, Bechu, 1997, Kongsin and Watts, 2000); (c) withdrawal of children from school (Lundberg and Over, 2000); (d) sale of productive assets undermining future economic viability of household (Menon and Wawer, 1997, Ngalula and Urassa, 2002); (e) impoverishment (Kongsin and Watts, 2000) and dissolution of households; and (f) emotional trauma or stress.

2. Methods

Identifying households affected by AIDS

One challenge of examining the role of AIDS on children's school outcome is the difficulty in ascertaining the cause. In particular the challenge of identifying households affected by AIDS. This is partly because of issues of confidentiality regarding the sero-prevalence status of individuals in light of the commonly observed stigmatisation and discrimination. Therefore it is generally unknown whether one or several household members are infected with the AIDS virus. In the absence of serological testing, the following proxies have been used in the literature to study different aspects of AIDS: (a) adult death in a household; (b) adults suffering from chronic disease as a proxy for adults suffering from AIDS; (c) presence of orphans and vulnerable

children in the household, which is mainly used by programmes that fight AIDS or support families in mitigating the consequences of the disease; (d) identifying household characteristics that best correlate with the sero-prevalence data; (e) data with sero-prevalence or AIDS status indicator. Table 2 shows a selection of studies investigating diverse aspects of AIDS in households and how they identified those affected by the disease. The detail of the studies is shown in annex 1. Each of the proxies has their own advantages and disadvantages.

Table 2: How a selection of studies identified households affected by HIV & AIDS

Title	Identifying households	Impact	Reference
Social grants as safety net for AIDS-affected households in South Africa	based on NGO caring for households affected by HIV [no evidence of testing]	Positive	(Booysen, 2004)
Nutritional status of young children in AIDS	Clinical AIDS identified through home-based care program for AIDS Patients [no evidence of testing]	No statistically significant difference	(Bridge et al., 2006)
Economic causes and effects of AIDS in South African households	HIV infected individuals obtaining care from local AIDS Training and Information Centers and hospices [no evidence of testing]	Positive	(Bachmann and Booysen, 2006)
The elderly and AIDS: Coping with the impact of adult death in Tanzania	adult death in a household [no evidence of testing]	Positive	(Dayton and Ainsworth, 2004)

(a) Adult death in a household

The proxy measure of an adult death is the easiest to determine. Even though AIDS is believed to be the first cause of adult death in high prevalence countries such as Uganda, it is believed not to be higher than 50 percent (Lundberg, 2000; Bourma, 1997). As such, at least 50 percent of the households in the sample experienced adult death due to causes other than AIDS. This is a large targeting error and makes inferences on impact of AIDS and mitigation by targeted programs less robust. This therefore ought to be put into consideration. However, in some respects it does not matter whether, say, the income earner died of AIDS or of, say a road accident. In both cases income is likely to fall and children more likely to be taken out of school compared to a household where the main income earner is still alive. For that reason, (recent) adult death can be regarded as a useful indicator, since the experience is similar. Moreover, it is a typical proxy used in practice.

(b) Adults suffering from chronic disease as a proxy for adults suffering from AIDS

Adults suffering from chronic disease can be used as proxy for adults suffering from AIDS. About 20% of those HIV positive are considered to be in the AIDS stage. From a measurement point of view, this might yield quite small samples, even in high prevalence countries. Targeting error occurs in as much as adults suffer from chronic diseases other than AIDS. This indicator singles out households that suffer from AIDS related illness' before the AIDS sufferer has deceased. In some respects the experience by someone who is chronically ill is similar to one who has AIDS, that is, the person will be less likely to contribute to household income, he/she will need care and there will be repeated expenditure on medical treatment. Hence, in this regard chronic illness is a good proxy for AIDS with respect to some dimensions, as the experience in some respects is similar.

(c) Presence of orphans and vulnerable children in the household

The presence of orphans and vulnerable children in the household is sometimes used by programmes that fight AIDS[25]. The value of this indicator to proxy for AIDS affected households depends on a number of factors. First, the question is whether the orphan lives with the surviving parent. In this case, the likelihood that the deceased parent died of AIDS will not exceed 50%. If the orphan lives in a foster family, the foster family will be affected by AIDS in as much as the orphan's parent(s) have died from AIDS. The foster family clearly experiences an impact that is different from the household in which an adult has died from AIDS. Lastly, precise information of the 'sibling history' type is necessary to distinguish foster parents that have taken on orphans from those that have (temporarily) adopted children for other reasons.

(d) Household characteristics that best correlate with the seroprevalence data

The information on seroprevalence can be used to identify a number of predictor variables. Simplified, this method identifies household characteristics that best correlate with the seroprevalence data. These characteristics or predictor variables can then be applied to datasets that lack seroprevalence data so that households can be subdivided into group with high and low probability of having an infected household member. Although of potential importance, this cumbersome and time consuming procedure appears to lead to promising results. Yet, since AIDS affection is different from HIV infection, this procedure is not further pursued.

(e) Data with seroprevalence or HIV status indicator

If data contains sero-prevalence indicator in the sample[26], this information allows to precisely charaterize between households with and without infected members. However, HIV infection doesn't always translate into impact at household level. But it is in the AIDS stage that an infected individual incurs high health care related costs while her/his income generating potential decreases simultaneously. Using this indicator also fails to capture those households that have suffered from an AIDS death and are dealing with the consequences after the death. The information on sero-prevalence was therefore complemented with other variables in order to identify those households that are of interest to this study.

The verdict therefore would seem that neither of the five proxy indicators of households affected by AIDS would suffice to provide a clear guidance on 'affected households'. However, from the studies reviewed, it seems more plausible that some proxies tend to yield expected results (see table 2). A combination of these proxies would provide probably more robust way of investigating the role of AIDS on never attending primary school. The challenge with ill health due to other diseases such malaria, tuberculosis and acute mild or moderate ailments is not as pronounced. Due to its frequency and prevalence, the misspecification is low for malaria. On the other hand, with respect to tuberculosis, it is unlikely to be confused. The mild or moderate ailments do not have major effect on education because of their nature.

[25] A related proxy is 'female headed households' Distinction can be made between 'de jure' single women (divorced or deceased husband) and 'de facto' single women (in case the husband lives/works elsewhere and infrequently comes home).

[26] The extent to which refusal rates bias results is subject to research. There are estimates that the HIV prevalence rate among refusing participants is somewhat higher (about 12% to 23%).

3 Data requirements and sources

The main data source was the Northern Uganda Survey (NUS) of 2004 conducted by Uganda Bureau of Statistics (UBOS) between July and December 2004 (Ssewanyana et al., 2007). The main objective of the survey was to collect data on demographic and socioeconomic characteristics of household and populations for monitoring development performance and at the same time provide baseline indicators for various socioeconomic and vulnerable groups. Specifically, the survey was meant to provide indicators to guide the monitoring and evaluation function of the Northern Uganda Social Action Fund (NUSAF) project for the period 2003-2008 in 18 districts of Northern Uganda. These are sub-divided into 5 sub-regions each with specific districts. West Nile region includes districts of Adjumani, Arua, Moyo, Nebbi and Yumbe. Acholi sub-region includes districts of Gulu, Kitgum and Pader. Lango sub-region includes districts of Apac and Lira. Teso sub-region includes districts of Katakwi, Kumi, Pallisa, Soroti and Kaberamaido. And Finally, Karamoja includes districts of Kotido, Moroto and Nakapiripirit. A map of Uganda highlighting the districts covered by the Northern Uganda Survey is shown in annex 2.

The survey covered 25,667 individuals in 4,787 households. The survey included several sections and questions that allow a characterization of children who; are currently in school, have never attended school and left school and the determination of the extent to which HIV and AIDS affect whether children are school attendance. Table 3 shows variables of interest extracted from the Northern Uganda Survey dataset.

Table 3: variables explored in the study

Unit of analysis			
	child of primary school going age (6-12 years)		
Dependant or classifying variable			
1	never attended school		
2	left school		
3	currently attending school or on vacation		
Stated reasons for being out of school			
1	Never attended school		
2	Left school		
Explanatory variables		Health, HIV & AIDS related	
		Yes	No
1	Orphan hood	X	X
2	Orphan hood due to disease	X	
3	Sickness due to AIDS & other diseases	X	
4	Death (last 12 months)	X	X
5	Death (last 12 months due to AIDS & other diseases)	X	

Source: Authors (compiled from NUS questionnaire)

3.1 Data analysis

The unit of analysis was children 6-12 years who are officially of primary school age. The dependent variable or classifying variable was a dummy indicating whether a child has never been to school or left school or is currently in school. The main focus was though on children who have never gone to school. Some of the independent variables are also shown in table 3 with an indication of whether they are ill health or AIDS related.

Data analysis was done at two levels: first, a descriptive approach was employed in which several independent variables were explored in relation to the three school outcomes: those who have never attended school, those who left school and those who are currently in school. The second level of analysis was a multivariate analysis using a logit specification. A logit specification was used to model the probability that a child has never attended school.

3.2 Results

Identifying households affected by AIDS

(a) Adult death in a household

Distribution of death

At what age should an individual die to qualify as an adult death? Any person who is 18 years plus is legally considered an adult in Uganda. However for purposes of this analysis we use the age used to estimate the population dependency ratio – which is a measure of the portion of a population that is composed of dependents (people who are too young or too old to work). The dependency ratio is equal to the number of individuals aged below 15 or above 64 divided by the number of individuals aged 15 to 64, expressed as a percentage.

The results in table 4 show that 30.35 percent (146) were adult deaths and of these 65.75 percent were male while 34.25 were female. Is there any clustering of adult deaths in households, that is, are there many adults death in specific households? Only 11 households or 7.53 have more than 1 death, and all those with one than one have two adult deaths in the last 12 months (results not shown). There does not seem to be clustering of adult death.

Table 4: Age distribution of death in the last 12 months, Northern Uganda

Age at death	Male	Female	Total	Number
under fives	55.3	44.7	49.3	237
Children 5-14	60.0	40.0	8.3	40
adults 15-64	65.8	34.3	30.4	146
elderly 65+	27.0	31.0	12.1	58
Total	57.8	42.2	100.0	481

What was the cause of adult death?

Out of 146 adult deaths, 30 were reported due to AIDS, 65 other illness, and 51 other causes (see table 5).

Table 5: Causes of adult death, Northern Uganda

Specific causes of adult death	Percent
illness, malaria	10.3
illness, AIDS	20.6
illness, diarrhea	2.7
illness, other	31.5
Accident	3.4
Domestic violence	0.7
insecurity or war related injuries	17.8
old age	0.7
giving birth	2.7
Bewitched	4.8
Others	4.8
Grouped	
Ill health	44.5
Aids	20.6
Others	34.9
Total	146

Relationship between cause specific adult death and schooling

Whether adult death?

Table 6 shows three indicators of schooling for children in the primary school age bracket and whether an adult death occurred in their households over the last 12 months prior to the survey. The table has three components: whether a household reported and adult death (A); cause specific adult death that is ungrouped (B) and cause specific death that has been grouped (C). As shown in the table, some of the cases for example adult death due to old age are too small for any meaningful analysis. However when these are grouped in component (C) of the table, meaningful analysis can be made.

Table 6: Adult death and schooling, Northern Uganda

	Never attended school	Ever attended school	Currently in school	Number
A: Household with adult death?				
Yes	17.5	2.7	79.8	6,911
No	15.0	2.2	82.8	233
Total	17.4	2.7	79.9	7,144
B: Cause specific adult death – ungrouped				
illness, malaria	16.7	4.2	79.2	24
illness, AIDS	10.9	4.4	84.8	46
illness, diarrhea	9.1	0.0	90.9	11
illness, other	18.5	1.5	80.0	65
Accident	0.0	0.0	100.0	7
domestic violence	0.0	0.0	100.0	2
insecurity or war related	17.4	2.2	80.4	46
old age	66.7	0.0	33.3	3
giving birth	8.3	0.0	91.7	12
Bewitched	10.0	0.0	90.0	10
Others	14.3	0.0	85.7	7
Total	15.0	2.2	82.8	233
C: Cause specific adult death – grouped				
Ill health	17.0	2.0	81.0	100
Aids	10.9	4.4	84.8	46
Others	14.9	1.2	83.9	87
Total	15.0	2.2	82.8	233

The results in table 6 suggest that an adult death in the household does not seem to have any noticeable effect on whether the children have never attended school, attended school and left (ever) or are currently in school.

Death from Malaria and AIDS seems to have a higher although marginal effect on children dropping out of school. The percentage of children who ever attended school but are now not in school is 4.35 percent in households where an adult death was due to AIDS and 4.17 percent in households where an adult death was due to malaria in the last 12 months. We have no information on whether the child dropped out within the year.

Considering those in school, children who come from households whose adult death is due to AIDS (84.8 percent) are doing better than those of malaria (79.2 percent) and insecurity (80.4 percent) but worse off than those of diarrhoea (90.9 percent). When grouped together, those of AIDS (84.8 percent) are doing better than those of other ill health (81.0 percent) and about 2 percent points above the average (82.8 percent).

(b) Adults suffering from chronic disease as a proxy for adults suffering from AIDS

Another aspect of identifying 'aids affected households' is to identify adults suffering from a chronic disease. There are two approaches of identifying a chronic illness. The first is from its duration. The common threshold adopted in many health surveys is three months [refer]. The second approach is by identifying a specific disease, for example diabetes or cancer or AIDS.

The survey collected information on the health of all household members and specifically whether a household member fell ill or injured in the last 30 days. This specification rules out using duration of illness, since only diseases that happened within the past one month are included. The second option still stands and has been explored before. Out of 25,670 individuals who responded to whether they fell sick in the last 30 days, 25.6 percent or 6,569 individuals reported an illness. Out of those who reported an illness, 2,798 individuals were adults 15-64 years of age.

Table 7: type of adult illness in the last 30 days

Illness	Percent
Malaria	41.64
respiratory, cough	18.58
Measles	0.36
Diarrhea	4.72
Aids	0.46
Cholera	0.11
Bilharzias	0.68
pregnancy related problems	2.72
Dental	0.89
intentional injury	0.61
unintentional injury	2.43
intestinal infections	3.65
skin infections	1.97
Hypertension	1.39
Ulcers	1.64
mental illness	0.71
Fever	4.32
Other illness	13.12
Total	**2,798**

From table 7 the main cause of adult ill health was reported to be malaria. Close to half (or 41.6 percent) of those that reported an illness reporting it. AIDS, which is the subject of this analysis,

did not feature predominantly, with only 0.46 percent or 13 adults. Among the diseases reported, the disease that would qualify to be chronic is aids and the numbers are too small for any meaningful analysis.

(c) Presence of orphans and vulnerable children in the household

The presence of orphans and vulnerable children is another proxy of identifying AIDS affected households. The easier of the two is identifying orphans. There are two aspects in which analysis can be done; first a focus on the individual orphan status and the second to focus on households with an orphan in the household.

1 - Orphaned children

The primary school going age are 6-13 years. From table 8, 81 percent are non-orphans. About 4.0 percent lost both parents, 12.1 percent lost the father only and 2.9 percent lost the mother only. Incidentally from table 8, children of school going age who are orphans seem to be more likely to be in school compared to children who are none orphans. In table 8, 79.3 percent of the non-orphans are in school compared to 88.0 percent who lost a mother only, 79.7 percent who lost a father only and 87.2 percent who lost both parents. It is not clear why this is the case. One would probably imagine that non-governmental organizations have tended to concentrate on orphans and left out other children who are non-orphans irrespective of whether they are more vulnerable. It could be a challenge of identifying vulnerable children mainly through their orphan status.

Table 8: Orphan status of primary school age children

	Never	Ever	In school	Total	Number
Not orphan	18.2	2.5	79.3	81.0	5,784
Lost mother only	10.5	1.4	88.0	2.9	209
Lost father only	16.1	4.3	79.7	12.1	866
Lost both parents	9.6	3.2	87.2	4.0	282
Missing					3
Total	17.4	2.7	79.9	100	7,144

2 - Households with orphans

The other aspect to consider is households with orphans.

Mother orphaned

Results in table 9 suggest that children who live in households where there is at least one orphan due to mother's death are both less likely to have never attended and left school and are thus more likely to be in school.

Father orphaned

Children who live in households where there is at least one orphan due to the father's death have higher levels of school drop out, although they are less likely to have never attended school. For example, the rate of drop out for a child in a household where there is at least one orphan due to

the father's death is 4.3 percent. This compared to 2.4 percent for children in households where there was no orphan due to father's death.

Both parents – total orphan

Children from households where there is at least one orphan due to death of both parents are less likely to have never attended school but are more likely to have dropped out of school compared to those children from households where there is no orphan due to the death of both parents. For example, the rate of drop out for a child in a household where there is at least one total orphan is 3.0 percent. This compared to 2.7 percent where there was no total orphan.

Table 9: School outcomes for children in households with different types of orphans

	Never	Ever	In school	Number
School outcomes for children in households with:				
No orphan due to mother's death	17.7	2.7	79.6	6,784
At least one orphan due to mother's death	12.2	1.9	85.8	360
No orphan due to father's death	17.8	2.4	79.8	6,017
At least one orphan due to father's death	15.4	4.3	80.3	1,127
No orphan due to both parents' death	18.0	2.7	79.3	6,650
At least one orphan due to both parents' death	8.9	3.0	88.1	494
Total	17.4	2.7	79.9	7,144

It might look quite surprising that when a child is from a household with children who are double orphans, then are protected from never attending school. At play here may not necessarily be the orphan status but the fact that when both children die, they are fostered and integrated with other children of the family.

Considering children in households where there is an orphan due to the father's death, the dynamic is slightly different. When the breadwinner dies, the family is affected and part of this effect is withdrawal of children from school.

(d) & (e) sero-prevalence data

The northern Uganda dataset did not have any data on HIV sero-prevalence. This means that identifying households affected by AIDS using sero-prevalence indicators either using characteristics that best correlate with the sero-prevalence data and data with sero-prevalence or HIV status indicator could not be done.

Summary on the role of AIDS and children school outcomes

The main goal of the study was to examine whether children who have never attended school are predominantly from 'AIDS affected households'. The evidence so far reflects that this is not the case whether we use such indicators as adult death, death due to AIDS or presence of orphans in households. This thus implies that there is no need for any multivariate specification to get the net effect of AIDS on school outcome.

The role of poverty

Now that the evidence is not conclusive that the last 10 percent of the children who have never gone to school is partly due to AIDS, what is the explanation? The first suspect is poverty.

The Northern Uganda Survey of 2004 contains useful information on changes in ownership of household and enterprise assets. These include: oxen, donkeys, cattle (excluding oxen and donkeys), goats, sheep, pigs, poultry, plough, hoe, boat or canoe, motor vehicle (car, truck), motorcycle, bicycle, generator or boat engine, irrigated fields, granary, enterprise assets (other than for agriculture), buildings, television, radio, cassette player, mobile or fixed phone, jewellery and watches, furniture, furnishings (e.g. carpet, mat, mattress, etc), household appliances (e.g. saucepan etc), land owned, land cultivated during first rains. The data was collected on the volumes of the assets in 1992, 1999 and 2004 retrospectively. The unit value of each of the items was collected as of 2004. With the data it is possible to estimate changes in total value of the assets owned by each household in 1992, 1999 and 2004.

There is a challenge of temporal association between asset and children school outcome data. There is an interval of 12-13 years between 1992 and 2004. In essence, it covers the whole period of primary school for children who were eligible to be in primary one in 1992. Two approaches are possible to this analysis – to consider changes that happened across the entire period, or to consider only the later period of 1999 to 2004. Both approaches were considered in the analysis.

Table 10 presents changes in household asset value between 1992 and 2004, and children's education outcomes. It considers two periods, between 1992 and 1999; and between 1999 and 2004. The first part of the table refers to the period 1992 to 1999. The second part refers to the period between 1999 and 2004. For example, improved-deteriorated implies that the household asset value improved between the period 1992 and 1999 but deteriorated between 1999 and 2004. Out of the households, 24.8 percent (see the total column) experienced improvements in asset value over the two periods while 16.7 percent experienced deterioration of asset value over the same time.

Table 10: Changes in household asset value and school outcome

	Never	Ever	In school	Total	Number
Improved – improved	12.2	1.9	85.9	24.8	1,770
Improved – deteriorated	23.8	3.5	72.7	20.0	1,427
Improved – same	13.8	13.8	72.4	0.4	29
Same – improved	15.0	2.6	82.4	9.1	649
Same – deteriorated	15.9	0.0	84.1	0.6	44
Same – same	15.6	3.5	80.9	2.4	173
Deteriorated – improved	14.5	2.7	82.9	25.3	1,805
Deteriorated – deteriorated	24.0	2.9	73.1	16.7	1,196
Deteriorated –same	9.8	0.0	90.2	0.7	51
Total	17.4	2.7	79.9	100.0	7,144

Children from households who experienced deterioration of asset value in the two periods were more likely to have never attended school (24.0 percent) followed by those from households where there was an initial improvement and then a deterioration (23.8 percent). Children from households where there was an improvement in the two periods were less likely to have never attended school (12.2 percent).

Using a logit specification (see table 11), four models were estimated. Model I examines the effect of aids death and includes in indicators of whether there was improvement or deterioration of household asset value over the two periods of 1992 to 1999 and 1999 to 2004. Also included in the model is an indicator of sex (male=1 and female=0) as well as the age of the child. The results from this analysis indicate that after controlling for other variables, a child from households where there was an adult death due to AIDS is not at an increased disadvantage of never attending school. However, children in households that experience deterioration of asset value are at increased risk of never attending school – and especially so the household experienced it in both periods (1992 to 1999, 1999 to 2004) and in the period 1999 to 2004. The odds are increased 168 percent for the first (1992 to 1999, 1999 to 2004) and 153 percent for the second (1999 to 2004). Older children, taking the based age to 6 years, are less likely to have never been to school. This is likely due to the delay in going to school for a number of children.

In model II, instead of using reported adult death due to AIDS, adult death in the last 12 months is used. This proxy is not statistically associated with a child never attending school. The rest of the variables in model I retain their levels of significance.

In model III and Model IV, there is an attempt to explore whether children who are in households that experienced an adult death due to AIDS and an adult death due to all causes are more likely to have never attended school. This is done by creating an interaction term in both models – interaction between death and change in household asset value in Model III; and interaction between adult death and change in household asset value in Model IV. In both cases, the interaction terms are not significant and children from households that experienced an adult death due to all causes and an adult due to AIDS are not at anymore increased risk.

Table 11: Logit estimates of the effect of changes in household asset value on never attending school

	Model I[a]			Model II[b]			Model III[c]			Model IV[d]		
	Odds Ratio	Std. Err.	Z-stat.	Odds Ratio	Std. Err.	Z-stat.	Odds Ratio	Std. Err.	Z-stat.	Odds Ratio	Std. Err.	Z-stat.
aids death in last 12 mos	0.66	0.333	-0.8				1.64	1.849	0.4			
adult death in last 12 mos				0.84	0.165	-0.9				0.56	0.291	-1.1
Change in household value asset (improved (1992-1999)-improved (1999-2004)												
improved-detoriated	2.53	0.257	9.2 **	2.53	0.257	9.2 **	2.53	0.257	9.1 **	2.56	0.264	9.1 **
improved-same	1.47	0.831	0.7	1.47	0.832	0.7	1.47	0.829	0.7	1.52	0.860	0.7
same-improved	1.38	0.192	2.3 *	1.38	0.192	2.3	1.36	0.190	2.2	1.34	0.191	2.1 *
same-detoriated	1.61	0.710	1.1	1.60	0.704	1.1	1.64	0.727	1.1	1.65	0.732	1.1
same-same	1.47	0.344	1.6	1.47	0.345	1.6	1.46	0.343	1.6	1.52	0.358	1.8
detoriated-improved	1.39	0.144	3.2 **	1.39	0.145	3.2 **	1.38	0.144	3.1 **	1.40	0.148	3.2 **
detoriated-detoriated	2.68	0.284	9.3 **	2.68	0.284	9.3 **	2.67	0.283	9.3 **	2.73	0.292	9.4 **
detoriated-same	0.86	0.426	-0.3	0.86	0.427	-0.3	0.85	0.425	-0.3	0.88	0.441	-0.3
Male	0.98	0.065	-0.4	0.98	0.065	-0.4	0.97	0.065	-0.4	0.98	0.065	-0.3
Age in years (6)												
7	0.36	0.037	-10.0 **	0.36	0.037	-10.0 **	0.36	0.037	-10.0 **	0.35	0.037	-10.0 **
8	0.25	0.025	-13.6 **	0.25	0.025	-13.6 **	0.25	0.025	-13.6 **	0.25	0.025	-13.6 **
9	0.15	0.020	-13.9 **	0.15	0.020	-14.0 **	0.15	0.020	-13.9 **	0.15	0.020	-13.9 **
10	0.14	0.017	-16.5 **	0.14	0.017	-16.5 **	0.14	0.017	-16.5 **	0.14	0.017	-16.5 **
11	0.09	0.017	-13.0 **	0.09	0.017	-13.0 **	0.09	0.017	-13.0 **	0.09	0.017	-13.0 **
12	0.12	0.015	-16.7 **	0.12	0.015	-16.7 **	0.12	0.015	-16.7 **	0.12	0.016	-16.7 **
13	0.09	0.015	-15.0 **	0.09	0.015	-15.0 **	0.09	0.015	-15.0 **	0.09	0.015	-15.0 **
Interaction term - aids death & change in asset (no aids death)[e]												
improved-detoriated							0.32	0.450	-0.8			
detoriated-improved							0.59	0.919	-0.3			
detoriated-detoriated							0.51	0.858	-0.4			
Interaction term - adult death & change in asset (no adult death)[f]												
improved-improved										1.93	1.337	1.0
improved-detoriated										1.32	0.817	0.4
same-improved										3.45	2.590	1.7
detoriated-improved										1.48	0.990	0.6
Number of observations		7144			7144			7134				7134
Pseudo R2		0.119			0.119			0.118				0.119

[a]LR $\chi^2(17)=782.47$; [b]LR $\chi2(17)= 782.58$; [c]LR $\chi2(20)=780.68$; [d]LR $\chi2(21)=783.59$;

[e]analysis of change in asset value only in households that experienced aids death

[f]analysis of change in asset value only in households that experienced aids death

**significant at 99% level; *significant at 95% level

Would the extent of changes in household asset value alter the magnitude of effect?

From the results in tables 10 and 11, the major effect of loss in household asset was between 1999 and 2004. Using this period, a percentage change in household asset value is computed as thus:

$$change\ asset\ value = \frac{2004\ household\ asset\ value - 1999\ household\ asset\ value}{1999\ household\ asset\ value} x100$$

A positive change in asset value would indicate that a household improved its asset value over the period while a negative value would indicate a decline. Table 12 shows that children from households who experienced the most decline in asset value during the period are more likely to have never stepped in school (30.0 percent) compared to the most performing category of household (those which experienced 7 to 35 percent improvement in their asset value). The children in households which experienced higher improvement in asset value do not necessarily show the best indicators. It is probable that other factors are at play here.

Table 12: extent of decline in household asset value and children's school outcomes

	Never	Ever	In school	Number
min to -39	30.0	2.7	67.3	1,336
-38 to 0	16.5	3.6	79.9	1,766
1 to 6	13.7	2.0	84.3	750
7 to 35	12.4	2.4	85.2	1,232
36 to max	14.9	2.1	83.1	1,340
Total	17.9	2.7	79.5	6,424

Again using a Logit specification, four models were estimated (see table 13). In model I, we examine the effect of aids death in which indicators of the extent of decline in household asset value over between 1999 and 2004 are included. Also included in the model is an indicator of sex (male=1 and female=0) as well as the age of the child. The results from this analysis indicate that after controlling for other variables, a child from households where there was an adult death due to AIDS is not at an increased disadvantage of never attending school. This result is similar to when only change in household asset value is examined. However, children in households that experience the largest decline in household asset value (less than -39) are at increased risk of never attending school. The odds of never attended school are increased 227 percent compared to the 153 that was estimated when considering a change in household asset value. Older children, taking the based age to 6 years, are less likely to have never been to school. Again, this is likely due to the delay in going to school for a number of children.

In model II, instead of using reported adult death due to AIDS, adult death due to all causes in the last 12 months is used. This proxy is not statistically associated with a child never attending school. The rest of the variables in model I retain their levels of significance. In model III and Model IV, there is an attempt to explore whether the extent of decline in household asset value affects children who are in households that experienced an adult death due to AIDS and an adult death due to all causes more. That is, examining the behaviour of extent of household asset decline in households that experienced an adult death due to all causes and an adult death due to AIDS. This is done by creating an interaction term in both models – interaction between death due to AIDS and extent of decline in household asset value in Model III; and interaction between adult death due to all causes and change in household asset value in Model IV. In both cases, the interaction terms are not significant. In other words, children in households that experienced an adult death due to all causes and an adult due to AIDS are not at any increased risk.

Table 13: Logit estimates on extent of decline in household asset value and children's school outcomes

	Model I[a]			Model II[b]			Model III[c]			Model IV[d]		
	Odds Ratio	Std. Err.	Z-stat.	Odds Ratio	Std. Err.	Z-stat.	Odds Ratio	Std. Err.	Z-stat.	Odds Ratio	Std. Err.	Z-stat.
aids death in last 12 mos	0.59	0.33	-0.94				1.18	1.273	0.2			
adult death in last 12 mos				0.8	0.169	-1.07				1.12	1.203	0.1
Percent change - [2004 value compared minus 1999 value divide 1999 value] (7 to 35)												
min to -39	3.27	0.36	10.66 **	3.28	0.365	10.69 **	3.28	0.364	10.7 **	3.34	0.374	10.8 **
-38 to 0	1.39	0.16	2.92 **	1.39	0.157	2.94 **	1.39	0.156	2.9 **	1.38	0.157	2.8 **
1 to 6	1.10	0.16	0.66	1.1	0.158	0.69	1.10	0.158	0.7	1.09	0.157	0.6
36 to max	1.19	0.14	1.43	1.2	0.145	1.48	1.19	0.144	1.4	1.21	0.148	1.6
Male	1.00	0.07	-0.04	1	0.07	-0.03	1.00	0.070	0.0	1	0.07	-0.03
Age in years (6)												
7	0.35	0.04	-9.54 **	0.35	0.039	-9.54 **	0.35	0.038	-9.6 **	0.35	0.038	-9.6 **
8	0.25	0.03	-12.9 **	0.25	0.027	-12.9 **	0.25	0.027	-12.9 **	0.25	0.027	-12.9 **
9	0.16	0.02	-12.9 **	0.16	0.023	-12.9 **	0.16	0.023	-12.9 **	0.16	0.023	-12.9 **
10	0.15	0.02	-15.4 **	0.15	0.018	-15.5 **	0.15	0.018	-15.4 **	0.15	0.018	-15.5 **
11	0.09	0.02	-12.4 **	0.09	0.018	-12.4 **	0.09	0.018	-12.4 **	0.09	0.018	-12.4 **
12	0.13	0.02	-15.6 **	0.13	0.017	-15.6 **	0.13	0.017	-15.6 **	0.13	0.017	-15.7 **
13	0.09	0.02	-14.3 **	0.09	0.015	-14.3 **	0.09	0.015	-14.3 **	0.09	0.015	-14.3 **
Interaction term - aids death &extent of decline in household asset value (no aids death)[e]												
min to -39							0.24	0.367	-0.9 .			
-38 to 0							0.79	1.066	-0.2			
Interaction term - adult death & extendt of decline in household asset value (no adult death)[f]												
min to -39										0.49	0.554	-0.6
-38 to 0										1.09	1.251	0.1
1 to 6										1.26	1.537	0.2
36 to max										0.56	0.658	-0.5
Number of observations			6424			6424			6419			6424
Pseudo R^2			0.123			0.123			0.123			0.123

[a]LR $\chi^2(13)=739.18$; [b]LR $\chi2(13)=739.39$; [c]LR $\chi2(15)=738.86$; [d]LR $\chi2(17)=742.86$;

[e]analysis of change in asset value only in households that experienced adult death

[f]analysis of change in asset value only in households that experienced adult death

**significant at 99% level; *significant at 95% level

3 Discussions

The paper set out to examine whether children who have never attended school are predominantly in 'AIDS affected households'. The results suggested that children who have never attended school are not predominantly from 'AIDS affected households'. Proxies for 'AIDS affected households' were: (a)reported adult death due to AIDS, (b) reported adult death due to all causes, and (c) reported presence of orphans in the household. Instead, the results pointed out that, children who have never attended school are predominantly in 'poverty affected households'. Proxy of 'poverty affected households' was decline in household asset value. These results will along three main issues: (a) the international literature on methods of identifying 'AIDS affected households' and children's school outcomes; (b)the policy debate on the remaining 10 percent of the children who have never attended school; and (c) the debate on reaching the last 10 percent through effective targeting mechanisms.

A: Results and the international literature

In discussing the results and the international literature, we seek to answer a series of questions: are the proxies of 'AIDS affected households' appropriate? To what extent do the results mirror results of similar studies?

Several studies have attempted to explore the role of AIDS on different aspects using various proxies (Booysen, 2004, Bridge et al., 2006, Bachmann and Booysen, 2006, Dayton and Ainsworth, 2004). Few however have used adult death as a proxy for AIDS death, notable among them is a study conducted in Northern Tanzania (Dayton and Ainsworth, 2004, The UN World Food Programme, 2006).In this study, the authors hypothesized that most prime-aged adult deaths due to illness would be due to AIDS. They found that there was adverse impact of adult deaths on the physical well-being of the elderly. The other studies reviewed (Booysen, 2004, Bridge et al., 2006, Bachmann and Booysen, 2006, Dayton and Ainsworth, 2004), proxies other HIV sero-prevalence testing results were used. With the exception of (Bridge et al., 2006) they yield positive results. Apart from adult death as a proxy to AIDS death, reported death due to AIDS was considered separately in the analysis. Also existence of orphans as a proxy in identifying 'AIDS affected households' was used in the analysis (The UN World Food Programme, 2006). All the three have been used in other settings as proxies and yield positive results. Therefore the fact that the results in this study show that children from 'AIDS affected households' is not due to using an inappropriate proxy.

To what extent do the results mirror results of similar studies? A Study using a sample of orphans in Entebbe, Uganda and found that their enrolment rate (88 per cent) was higher than the national average (Kitonsa et al., 2000). This the authors credit to the traditional extended family, the government universal primary education, and, possibly, non-governmental organizations (NGOs) operating in the area.

With respect to poverty, (Ainsworth and Filmer, 2002) analysed the relationship between orphan status, poverty, and school enrolment or children aged 7–14 in 28 countries on four continents, using 39 nationally representative household surveys. Poverty was measured internally within each data set by a continuous wealth index based on the factor loadings from the first component of a principal component analysis. They found great heterogeneity in terms of whether orphans were more likely to be living with poor or non-poor households and the extent of under enrolment of orphans relative to children with living parents, concluding that the policy implications should be considered on a country-by-country basis. (Case et al., 2004) examines the relation between orphan status, poverty and school enrolment in 19 DHS data sets from 10 sub-Saharan African countries for children aged 6–14. Using a wealth index that is a simple count of the number of six specific durable goods owned by the household, they concluded that orphans are more likely to be poor, that poor children are less likely to be enrolled, but that orphans face additional enrolment disadvantages attributable to the degree of 'relatedness' between the child and his/her caregiver (proxied by the relation between the child and the head of household). Two more studies used longitudinal data to examine the impact of adult deaths on school enrolment. (Yamano and Jayne, 2005) examine the impact of 'working age' adult deaths on the school enrolment of children aged 7–14 using data from a three-round panel of households in rural Kenya from 1997, 2000 and 2003. They find that children in relatively poor

households are more likely to drop out of school following an adult death than are children in relatively non-poor households and that enrolments fall prior to the death, possibly because of the need to care for the sick adults. (Gertler et al., 2003) study the impact of adult mortality in two countries with low levels of AIDS (Indonesia and Mexico), using large panel data sets. Two-parent orphans in these countries were extremely rare, so the analysis focused on the effect of enrolment of single-parent orphans. They find that children with a deceased parent are less likely to start school and more likely to drop out of school. These effects hold even when controlling for the household's economic status, indicating that they may be due to non-monetary, emotional or psychological causes.

B: Results and the last 10 percent policy debate

Now that children who have never attended school are not predominantly from AIDS affected households, where should the policy debate focus to bring them into school? The debate on children who are out of school and AIDS is built on the premise that the epidemic impacts schools and education in several ways. It reduces the supply of education by reducing the numbers of teachers who are able to carry out their work, and the resources available for education. The epidemic reduces the demand for education, as children are withdrawn from school or not taken to school at all and college in response to rising household expenditure, and to provide care for family members. And, the epidemic affects the quality of education because of the strains on the material and human resources of the system and on health and presence of learners. Finally beyond this, the epidemic also impacts negatively on the quality of education and consequently on progression through education systems. The quality of education suffers in the form of teacher absenteeism and attrition, less time for teaching, and disruption of classroom and college schedules affect the kind of learning that can take place. Teacher education also suffers as those working in universities and colleges become affected (International Institute for Educational Planning, 2003). However from our work and the work of others, efforts targeting the poorest households may provide more positive results compared to those targeting 'AIDS affected households'.

The general prescription of priorities to mitigate the impact of AIDS on the education sector such as the education system providing leadership in a multi-sector approach, tackling broader issues of debt relief, poverty reduction and sustainable development are likely to end without much action on the household. This is not because they are not important but they are inheriting most appropriate for mass policies and not specific targeting.

The debate should instead focus on simply identifying those children who have never gone to school, attempt an in-depth understanding why they are not and addressing their specific circumstances. Or the debate should focus more on preventing households from falling into poverty, which will address other related access issues such as health services. In this case focus will probably be in attempting to debate on sufficient synthesis of existing and new knowledge on how best to target them.

C: Results and targeting

Where does this leave the debate on how best to target the last 10 percent who never go to school? Is mass removal of school fees sufficient for these children who come from households

that are affected by a decline in their asset value? Probably not, because of evidence from Uganda where this study is based has implemented free primary education since 1997 but these have gone through the sieve (refer). Could we use other mechanisms that have the greater specificity? What should be the focus – dragging them to school or focusing on reducing household vulnerability to decline in asset value? It may make more to sense reduce household vulnerability to deplete their asset value than dragging the children to school. A more effective approach to comb the remaining few back into school will be one that will address the challenges of every remaining child or children. A global strategy will not be effective rather one based on an understanding pockets of households in which children are not going to school. Each of the small pockets will require different approaches or different levels of combinations to deal with the issue of not being in school.

Should this mop up be left to government or non-government institutions? We would argue that government works with non-government institutions to do the mop up. Government may be suited for the big bangs like free primary education but may find difficulties in conducting mop up operations.

References

Ainsworth, M. & Filmer, D. (2002) "Poverty, aids, and children's schooling: a targeting dilemma," *Policy Research Working Paper*. Washington dc, World Bank.

Bachmann, M. O. & Booysen, F. (2003) "Health and economic impact of aids on south african households: a cohort study," *Bmc public health,* 3.

Bachmann, M. O. & Booysen, F. L. R. (2006) "Economic causes and effects of aids in south african households," *Aids,* 20**,** 1861-1867.

Barnett, t. & whiteside, a. (2002) A*ids in the twenty-first century: Disease and Globalization,* New york, Palgrave Macmillan.

Bategeka, l., Ayoki, M. & Mukungu, A. (2004) *Financing Primary Education for All: Public Expenditure and Primary Education Outcomes in Uganda,* Kampala, Uganda.

Bechu, N. (1997) The impact of aids on the economy of families in cote d' ivoire: changes in consumption among aids-affected households. In bank, w. (ed.) *Confronting aids: public priorities in a global epidemic.* Washington, world bank.

Bollinger, l. & Stover, J. (1999) The economic impact of aids in south africa,The futures group international in collaboration with: research triangle institute (rti), the centre for development and population activities (cedpa), the policy project.

Booysen, F. (2004) "Social grants as safety net for aids-affected households in south africa," *Journal of social aspects of aids research alliance,* 1**,** 45-56.

Bridge, A., Kipp, W., Jhangri, G. S., Laing, l. & Konde-lule, J. (2006) "Nutritional status of young children in aids-affected households and controls in uganda," *Am. J. Trop. Med. Hyg.,* 74**,** 926-931.

Case, A., Paxson, C. & Ableidinger, J. (2004) Orphans in Africa: parental death, poverty and school enrollment. *NBER Working Paper*. Cambridge, MA.

Chima, R. I., Goodman, C. A. & Mills, A. (2003) "The economic impact of malaria in africa: a critical review of the evidence." *Health policy and planning,* 63**,** 17-36.

Dayton, J. & Ainsworth, M. (2004) The Elderly and Aids: Coping with the Impact of Adult death in Tanzania. *Social science & medicine,* 59**,** 2161-2172.

Gertler, P., Martinez, S., Levine, D. & Bertozzi, S. (2003)Losing the presence and presents of parents: how parental death affects children. University of california, berkeley.

Goudge, J. & Govender, V. (2000) A review of experience concerning household ability to cope with the resource demands of health care utilisation *equinet policy series no. 3.* Centre for health policy, university of the witwatersrand, and health economics unit, university of cape town.

Human Rights Watch (2005) Letting them fail: government neglect and the right to education for children affected by aids. *Human rights watch,* 17.

Iatt (2004) Orphans and vulnerable children living in a world with hiv and aids: 15-16 december 2004. *Second global partners' forum.* Washington, d.c.

International Institute for Educational Planning (2003) Aids & education: a strategic approach. Paris, international institute for educational planning/UNESCO.

Kamolratanakul, P., Sawert, H., Kongsin, S., Lertmaharit, S., Sriwongsa, J., Na-songkhla,S., Wangmane, S., Jittimanee, S. & V., P. (1999) Economic impact of tuberculosis at the household level. *International journal of tuberculosis & lung disease,* 3**,** 596-602.

Kitonsa, E. N. K., Antivelink, l., Kajura, C. A., Kaleebu, P. & Opolot, J. A. (2000) The needs and coping mechanisms of children orphaned by aids in semi-urban south uganda: implications for policy makers. *Xiiith international conference on aids, Durban, South Africa 2000.*

Kongsin, S. & Watts, C. (2000) Conducting a household survey on economic impact of chronic aids morbidity in rural thailand: methodological issues. *Iaen economics of aids symposium.* Durban, South Africa.

Luhanga, T., Chilimampunga, C., Salaniponi, F. M. L., Squire, S. & Kemp, J. (2001) Gender Differences in access to treatment and caring for tb patients within households. *Int j tuberc lung dis,* 5:11.

Lundberg, M. & Over, M. (2000) Transfers and household welfare in kagera. *Iaen economics of aids symposium, Durban, South Africa.*

Mcintyre, D. & Thiede, M. (2003) A Review of studies dealing with economic and social consequences of high medical expenditure with a special focus on the medical poverty trap. Cape town, health economics unit, university of cape town. .

Menon, R. & Wawer, M. J. (1997) The economic impact of adult mortality on households in rakai disrtrict, uganda. In bank, w. (ed.) *Confronting aids: public priorities in a global epidemic.* Washington, world bank.

Ngalula, J. & Urassa, M. (2002) Health service use and household expenditure during terminal illness due to aids in rural tanzania. *Tropical medicine & international health,* 7**,** 873-877.

Nhlema, B. & Kemp, J. (2003) A systematic analysis of TB and poverty. London, TB and poverty advisory committee.

Pitayanon, S., Kongsin, S. & Janjaroen, W. (1997) the economic impact of aids mortality on households in Thailand. In Bloom, D. & Godwin, P. (Eds.) *The economics of HIV and AIDS: The case of south and south east asia.* Delhi, oxford university press.

Pryer, J. (1989) When breadwinners fall ill: preliminary findings from a case study in Bangladesh. *IDS Bulletin,* 20**,** 49-57.

Rajeswari, R. & Balasubramanian, R. (1999) Socio-economic impact of tuberculosis on patients and family in india. *International Journal of Tuberculosis & Lung Disease,* 3**,** 869-77.

Russell, S. (1996) Ability to pay for health care: concepts and evidence. *Health policy and planning,* 11**,** 219-237.

Russell, S. (2001) Can households afford to be ill? The role of the health system, material resources and social networks in Sri Lanka. *Phd thesis.* London school of hygiene and tropical medicine, university of london.

Russell, S. (2004) The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immunodeficiency syndrome. *Am. J. Trop. Med. Hyg.,* 71**,** 147–155.

Sauerborn, R., Adams, A. & Hien, M. (1996) Household strategies to cope with the economic costs of illness. *Social science and medicine,* 43**,** 291-301.

Ssewanyana, S., Younger, S. & Kasirye, I. (2007) Poverty under conflict: the case of northern Uganda. *Centre for African economies conference 2007: economic development in africa, march 18-20, 2007.* Oxford, United kingdom.

The UN World Food Programme (2006) Orphans and vulnerable children in zambia: an assessment of vulnerability in selected districts supported under the community schools feeding programme. Lusaka, zambia, UN World Food Programme.

Uganda Bureau of Statistics & ORC Macro (2006) *Uganda demographic and health survey 2006: preliminary report, K*ampala, uganda, Calverton, maryland, u.s.a., uganda bureau of statistics.

Yamano, t. & jayne, t. S. (2005) working-age adult mortality and primary school attendance in rural kenya *Economic Development and Cultural Change,* 53 619-653.

World Bank. (1998). *Confronting AIDS.*Washington, DC:World Bank.

Annex 1: Map of Uganda showing districts in which the Northern Uganda Survey was conducted