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Poverty, AIDS, Orphanhood, Gender, and Child Schooling in Sub-Saharan Africa: A Review of the Evidence

by

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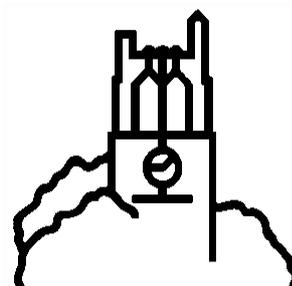
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POVERTY, AIDS, ORPHANHOOD, GENDER, AND CHILD SCHOOLING IN SUB-SAHARAN AFRICA: A REVIEW OF THE EVIDENCE

by

David Mather

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EXECUTIVE SUMMARY

There is growing concern that the HIV/AIDS epidemic may reduce long-term human capital development through reductions in child schooling in SSA, thus severely limiting the long-term ability of orphans and their extended families to escape poverty. In response, some have called for targeted schooling subsidies for orphans and other children made vulnerable by HIV/AIDS, on the assumption that such children are under-enrolled. This paper provides an overview of the data sources used by existing empirical studies that test for orphan schooling deficits and the methodological challenges that they face. It then reviews the empirical evidence on the effects of orphan status or adult mortality on child schooling, as well as the prevalence of orphans in SSA and their living arrangements.

As portrayed by media and some donor reports, the term 'AIDS orphan' often elicits the image of a child who has lost both parents to AIDS, and who either lives in a child-headed household, a household headed by grandparents who cannot afford to send them to school, or in an orphanage. While children in such circumstances are very likely to be vulnerable to poverty and poor schooling outcomes, empirical evidence shows that in most SSA countries, about 90% of orphans have a surviving parent, that a majority of these single-parent orphans live with their surviving parent, and that child-headed households are extremely rare. While a few countries (Kenya, Malawi, Namibia, Zambia, and Zimbabwe) continue to experience growth in their overall orphan rates (as well as having the highest rates of double-orphans), orphan rates have remained relatively stable in most SSA countries in the past decade (Beegle et al. 2010). In addition, while on average one in six households with children in SSA are caring for orphans, the evidence to date suggests considerable resilience among extended families in absorbing orphaned children. However, there are signs that this is becoming more difficult in some countries (those with rapidly increasing orphan rates), as an increasing number of double-orphans and single-orphans not living with a surviving adult are living with grandparents who tend to be relatively poor.

The findings of the studies reviewed in this paper demonstrate that there is considerable heterogeneity in the effects of orphan status or adult mortality on child schooling in SSA. The bulk of the evidence demonstrates that the extent to which orphans are under-enrolled relative to other children is country-specific, and very often specific to certain kinds of orphans. For example, several of the multi-country studies find that while orphan schooling deficits are relatively large and statistically significant in some countries, in other countries orphan schooling deficits are relatively small or not statistically different from zero. In addition, children who have lost both parents are considerably more likely to have statistically significant schooling deficits (and of larger magnitude) than single-parent orphans. Among the countries where an orphan schooling deficit appears to exist, the existence and magnitude of schooling deficits sometimes vary considerably by characteristics of the child (gender), the deceased adult (gender or household position), and the household (wealth level). For example, in some countries, schooling deficits are only found among female and not male orphans, among maternal and not paternal orphans, or among orphans in relatively poor households but not those from wealthier households. In addition, in most countries, the gender schooling gap is not worse among orphans.

Second, the findings from three large multi-country studies demonstrate that household wealth is a much better predictor of poor child schooling than orphan status in most SSA countries. For example, these studies find that school attendance gaps between poorer and wealthier non-orphan children are two to three times larger than single-parent orphan schooling deficits in most countries, and in most cases as large as the double-orphan deficit. Third, it is clear from several of the studies that the school enrollment of orphans relative to

non-orphans may change significantly over time within a given country, either for the better in the case of abolition of primary school fees, or for the worse if orphan rates increase dramatically over time. Fourth, the studies based on panel data also show that negative effects of orphan status or adult death on child schooling may occur during the pre-death illness period, after the death of the parent or adult, or both.

There are several policy implications from these results. First, because the extent to which orphans are under-enrolled relative to other children is country-specific, social protection and education policymakers concerned with primary school under-enrollment need to tailor mitigation measures to the specific needs and situation of each country. Second, the results also imply that it is inappropriate to categorize all children who are directly or indirectly affected by HIV/AIDS-related morbidity and mortality as being especially vulnerable and in need of targeted school subsidies. Use of orphan or OVC (orphans and other vulnerable children) status alone as an indicator of poor schooling is often inappropriate, as the children facing the biggest schooling deficits in many SSA countries are double-orphans and children from the poorest 20-40% of households.

Third, in countries with relatively low to medium levels of primary school enrollment, targeting children from poorer households with schooling subsidies should improve the enrollment and schooling progress of children most likely to suffer from poor schooling, both orphan and non-orphan alike (Ainsworth and Filmore 2006). Some countries have already gone further than this by eliminating primary school fees for all children. Evidence from Malawi and Uganda suggest that improvements in enrollments among the poor through universal abolition of primary school fees can substantially raise the enrollment of orphans, even to the point of eradicating orphan schooling deficits (*ibid*. 2006). In addition, the most recent DHS data show that orphan attendance rates are nearly on par with non-orphans in many SSA countries, and that double-orphan schooling deficits in many countries have fallen dramatically (UNICEF 2010). Future research could usefully document these enrollment improvements and investigate the role of abolition of primary school fees relative to subsidies targeted to orphans in explaining the apparent improvements in primary enrollment among orphans.

Fourth, even in countries that have abolished primary school fees, there may still be barriers to enrollment such as continued household demand for child labor, additional educational expenses for transport, school uniforms and books, and declining school quality if enrollment outpaces new school construction and teacher hiring. These additional barriers to enrollment may explain why adult mortality was found to result in child schooling losses in Zambia and Mozambique, even during a period after those governments had abolished primary school fees. In addition, targeted schooling subsidies alone may not reduce schooling deficits of some orphans, in the event that their poor schooling progress is due to the emotional and psychological trauma of losing one or both parents or a lack of interest by their adult guardians in their schooling.

Fifth, the timing of the negative effects of adult mortality on child schooling implies a potential dilemma with respect to targeted assistance to orphans. On the one hand, in many countries, it would likely be inefficient for policymakers to target school subsidies to single-parent orphans, as many of these children would likely attend school in the absence of a subsidy. Yet, if policymakers were to target assistance instead to only children who had lost both parents, such children would likely have already incurred schooling losses that might be difficult to make up later. In a situation where school fee abolition is not possible for either the poorest children or universally, policymakers intent on targeting schooling subsidies to

orphans may thus want to focus on two-parent orphans, as well as single-parent orphans in poor households where the surviving parent is either non-resident or chronically ill.

Finally, it should be noted that because of the well-established positive correlation between educational attainment and safer sexual behavior (World Bank 1999), Education for All is itself an important policy that can help reduce the spread of HIV/AIDS.

CONTENTS

LIST OF TABLES

ACRONYMS

AF	Ainsworth and Filmer 2006 – referred to in section 4. as AF
BFS	Bureau of Food Security
DHS	Demographic and Health Surveys
EGAT	Economic Growth, Agriculture, and Trade
IHS	Integrated Household Surveys
JLICA	Joint Learning Initiative on Children and HIV/AIDS
LSMS	Living Standards Measurement Survey
MICS	Multiple Indicator Cluster Surveys
MSU	Michigan State University
OVCs	Orphans and (other) Vulnerable Children
SSA	Sub-Saharan Africa
SALDRU	Southern Africa Labour and Development Research Unit
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	The United Nations Children's Fund
USAID	United States Agency for International Development
WA	working-age

1. INTRODUCTION

As we enter the third decade of the AIDS epidemic in Sub-Saharan Africa (SSA), there is growing concern that it may reduce long-term human capital development through reductions in child schooling, thus severely limiting the long-term ability of orphans and their extended families to escape poverty. There is understandable fear that school-aged orphans might have guardians who cannot afford the costs of schooling, the child may be needed for economic activities, or that guardians simply have less interest in the welfare of children who are not their own (World Bank 1999; Foster and Williams 2000; Case, Paxson, and Ableidinger 2004). This prompted calls a decade ago for governments and donors to subsidize the schooling of orphans (USAID 2000; World Bank 2002). A few years later, after recognizing the potentially stigmatizing effect of directly targeting 'AIDS orphans', as well as the need to include vulnerable non-orphans indirectly affected by the epidemic, The United Nations Children's Fund /Joint United Nations Programme on HIV/AIDS (UNICEF/UNAIDS) shifted its terminology and programming focus to 'Orphans and (other) Vulnerable Children' (OVC). 'Other vulnerable children' are defined as those who have an ill parent, are in poor households that have taken in orphans, are discriminated against because of a family member's HIV status, or who have HIV themselves (USAID/UNAIDS/UNICEF 2004).

Reflecting this updated focus, the 2004 biennial publication *Children on the Brink* recommended that "programs should target geographic areas seriously affected by HIV/AIDS and then support the residents of these communities in organizing to identify and assist the most vulnerable children and households, regardless of the specific causes of vulnerability" (USAID/UNAIDS/UNICEF 2004). While this approach concedes that communities perhaps are in the best position to assess who are the 'most vulnerable' children with respect to schooling, it nevertheless presumes to know which children and communities are 'most vulnerable', based on the expected number of OVCs. In addition, while this approach acknowledges that the economic loss associated with AIDS-related adult mortality is one of several challenges facing SSA households which may lead to child under-enrollment, the policy prescription of targeting school subsidies to OVCs is, nevertheless, based on the overriding assumption that orphans have poorer schooling outcomes than other children and represent the epitome of vulnerability in SSA. A multi-country study by Case, Paxson, and Ableidinger (2004) lends empirical support to this argument, reporting evidence of orphan schooling deficits, and arguing that targeting of subsidies to orphans is justified because such deficits exist even after controlling for household wealth.

Critics of this approach question the usefulness of orphan status as a universal indicator of under-enrollment, noting results of an early multi-country study of SSA which found that while enrollment rates were slightly higher for children with living parents, these differentials were rarely sizeable (five percentage points or greater) and/or statistically significant (Lloyd and Blanc 1996). A larger multi-country study a few years later found so much diversity in their results that they concluded that the extent to which orphans are under-enrolled in SSA relative to other children – if at all in some cases – is country-specific and cannot be assumed (Ainsworth and Filmer 2002). Ainsworth and Filmer's (2002) results also question whether the schooling progress of orphans is on average worse than that of children from the poor households – therefore requiring a targeted intervention linked to their special needs – or whether the impact of becoming an orphan is to further increase the already large group of poor children currently under-enrolled in many SSA countries. In the latter case, one might argue for policies that will raise the levels of schooling of the under-enrolled poor, and thus reach the most vulnerable children, whether orphan or non-orphan.

Many SSA countries have long had among the lowest levels of primary school enrollment in the developing world, due primarily to schooling gaps between the poorest and wealthiest households (Filmer and Pritchett 1999; Lloyd and Hewett 2003). However, the recent abolition of primary school fees in a growing number of SSA countries has led to dramatic increases in primary school enrollment; between 1999 and 2007, the average net primary school enrollment ratio in Sub-Saharan Africa increased from 56% to 73% (UNESCO 2010). The expansion of primary education has gone hand in hand with progress towards gender parity, as 17 of the 41 countries with data in SSA have achieved gender parity in primary education (*ibid*. 2010). At the same time, there has been increasing global attention and resources allocated to mitigating the impacts of the HIV/AIDS epidemic, including those related to the welfare of children directly or indirectly affected by AIDS-related adult morbidity and mortality.

Within the context of these trends in education and health, effective programming for each sector requires that policy-makers know the scope and nature of child under-enrollment in SSA, which children are most affected, how and why they are affected, and which policy instruments are likely to have the greatest impact on raising child schooling. Definitions of child vulnerability thus play a central role in the allocation of scarce resources aimed at improving child welfare in SSA, and the usefulness of such definitions depends upon an accurate understanding of which children are most likely to have poor schooling outcomes. While there have been a growing number of studies in recent years that have measured the effect of orphan status or adult mortality on child schooling, there has not been an in-depth, cross-country review of their findings. This paper aims to describe the nature of the existing studies, critique the methodologies used, synthesize their findings, and discuss the implications of these findings for policymakers concerned with human capital development in SSA.

We begin by first examining the economic factors that influence child schooling and how these might be affected by the illness and death of parents or adults in the household. We then provide an overview of the data sources used by existing studies that test for orphan schooling deficits and the methodological challenges that they face. We next summarize the empirical evidence regarding the prevalence and living arrangements of orphans in SSA. We then synthesize the results from selected studies of the effect of orphan status or adult mortality on child schooling to answer several questions: 1) Do orphans have worse schooling indicators than non-orphans? 2) How do orphans' schooling outcomes compare with those of children from non-afflicted but poor households? 3) Do orphan schooling deficits vary by the gender or household position of the deceased parent or adult? 4) Is the gender gap in schooling larger for orphans? 5) When do effects of adult mortality affect child schooling – before the death, after, or both? Finally, we discuss the policy implications of the synthesized results from the studies reviewed.

2. CONCEPTUAL FRAMEWORK

The principal economic factors that affect parents' decisions regarding the schooling of their children (or foster children) include the financial costs of schooling relative to the household's resources, the opportunity costs of children's time in other activities, and the expected returns from schooling. The potential effects of working-age (WA) mortality or morbidity on child schooling depends on how such events affects these factors (World Bank 1999).

First, medical expenses during the pre-death illness period and eventual funeral costs can reduce the financial resources of the household (Barnett and Blaikie 1992). Depending upon the household's initial income and wealth status, and the impact of illness and death on these variables, school fees could become prohibitive for some households during the illness and/or post-death periods, especially if the ill or deceased adult was a key cash-earner for the household. While a number of SSA countries have recently abolished fees for primary school, there are often additional school expenses such as for school uniforms, books, transport, food at school, etc.

Second, the opportunity costs of children's time, which increase with age, may also increase based on demands for caregiving (during the illness period) and to replace the family labor lost due to the adult's illness or death (during both the illness and post-death periods). The way in which households respond to internal labor supply shocks likely depends upon their financial and social resources. For example, households with sufficient income may hire additional workers to meet residual labor needs. Some afflicted households are able to attract additional members to at least partially offset the loss of another member (Ainsworth, Ghosh, and Semali 1995; Beegle 2003; Mather et al. 2004).

Third, in the context of countries or regions with high HIV incidence, higher adult mortality rates may shorten the expected number of years of wage-earning, which could alter parents' perceptions of the future benefits of investing in child schooling. In addition, the perceived value of returns from a child's education may be lower for the extended family of two-parent orphans, who may well be less interested in investing in the long-term welfare of children who are not their own (because they may not feel assured that such children will help provide for them when they are older). Of course, there are also non-economic factors by which a parent's death may affect a child's schooling, such as emotional and psychological trauma, which could result in poor school attendance and progress.

3. DATA AND METHODOLOGICAL ISSUES

3.1. Definition of Orphan

The definition of the term *orphan* as used by UN agencies in the production of global statistics is a child under 18 years old who has lost one or both parents – a definition that is unfortunately at odds with everyday understandings of this term in both Western and African cultures.[1] Most of the published studies we review here consider three mutually exclusive types of orphan: a child who has lost his/her father only (paternal orphan), his/her mother only (maternal orphan), or both parents (double orphan). Many studies that test for orphan schooling deficits are based on data that only records schooling and parents' vital status for children under 16, thus they tend to focus on the schooling of orphans age 7-15.

There are two main categories of data sources used by studies that attempt to measure the impact of orphan status or adult mortality on child schooling. The first group uses large cross-sectional household datasets such as: the Demographic and Health Surveys (DHS) sponsored primarily by the United States Agency for International Development; Multiple Indicator Cluster Surveys (MICS) supported by the United Nations Children's Fund (UNICEF); and occasionally Integrated Household Surveys (IHS) such as LSMS (Living Standards Measurement Survey) supported by the World Bank. These household surveys typically record the age, current school attendance, highest grade completed, and vital status of the parents of children in each household. Some of the most recent DHS also include serological testing for HIV/AIDS. Studies based on these data sources typically present descriptive statistics which compare current school enrollment of orphans with non-orphans, and sometimes estimate regressions of school enrollment on orphan status, child gender and age, and household and village characteristics (Lloyd and Blanc 1996; Ainsworth and Filmer 2002; Bicego, Rutstein, and Johnson 2003; Case, Paxson, and Ableidinger 2004; Monasch and Boerma 2004; Ainsworth and Filmer, 2006; Akwara et al. 2010). DHS data offer several advantages, including the fact that it is implemented in many SSA countries, uses a survey instrument which is broadly comparable across countries, is repeated every 5-10 years, and is usually nationally representative.[2]

The second group of studies uses longitudinal survey data from regional or nationally-representative surveys of household demographics, income or expenditure, and occasionally labor use (Yamano and Jayne 2005; Ainsworth, Beegle, and Koda. 2005; Yamano, Shimamura, and Sserunkuuma 2006; Evans and Miguel 2007; Case and Ardington 2006; Beegle, de Weerdt, and Dercon 2006; Deininger, Garcia, and Subbarao 2003; Yamauchi, Buthelezi, and Velia 2006; Ueyama 2007; Himaz 2009; Mather 2011a; Mather 2011b). Most of these studies use panel econometric methods, and they measure either the impact of orphan status on child schooling or the impact of an adult illness or death on the schooling of children in such households. None of the studies are based on survey data that includes

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[1] In most Western contexts, the term orphan is used for a child who has lost both of his/her parents. In Sub-Saharan Africa, the term orphan is not specifically tied to the vital status of a child's parents, and typically only refers to a child who does not have extended family to care for them. For example, qualitative research in South Africa finds that the traditional meaning of the term orphan is "associated with a lack of care and/or resources; synonymous with being unloved, uncared for and destitute, the categorization carries with it stigma and pity. The labeling of a child in this way is not only stigmatizing of the child, but a direct insult to those participants in the social network providing care and support to the child." (Meintjes and Giese 2006).

[2] Although the focus of the DHS is a questionnaire administered to women of reproductive age and a subsample of men, the DHS itself is a random sample of all households in the survey enumeration areas (Beegle et al. 2010).

serological information that could verify the nature of the death of parents or adults in the household. However, some of the studies differentiate between deaths that are reported by the surviving household survey respondent to be disease-related, and those that are due to accidents, old age, etc., and proceed to use disease-related prime-age adult death as a rough proxy for an HIV-related death.

An advantage of studies that use longitudinal or panel data measuring schooling indicators both before and after an adult illness or death is the ability to use panel econometric methods that control for both initial household characteristics (such as pre-death household wealth) and potential unobserved time-constant household or individual characteristics that can bias estimates from ordinary least squares or propensity score matching approaches. One challenge faced by studies which use panel data is the need to test for attrition bias (and apply necessary corrections if found), which may occur if individuals or households which are not re-interviewed are systematically different from those which are (i.e. if the re-interviewed households constitute a non-random subsample). This is especially true for studies measuring the impact of adult mortality on socioeconomic outcomes, as adult mortality can increase the likelihood of individual migration or household dissolution (Hosegood et al. 2004a). Most panel household surveys in SSA do not track individuals who migrate out of the initial household sample; the only exceptions are Beegle, de Weerdt, and Dercon (2006) and Ueyama (2007).

While many SSA countries have recently made progress toward achieving universal primary school enrollment, the average net enrollment ratio for secondary school in SSA is only 29% (UNICEF 2009). Unfortunately, there is little empirical evidence of the effects of orphan status or adult mortality on secondary schooling in SSA, as all but two of the studies reviewed here focused on primary school enrollment. The lack of studies in this area is partly due to the understandably greater focus on improving primary education in many SSA countries, and partly because DHS – by far the most prevalent source of nationally representative data on orphan status and schooling – only records orphan status for children age 0-14.

3.2. Measures of Child Schooling

The studies reviewed in this paper primarily use data from household surveys which record schooling indicators such as: current attendance or enrollment in school (yes/no), years of primary and secondary schooling completed (years), and literacy (yes/no). Some studies compute a measure of school advancement defined as the ratio of the highest grade attained to date over the grade that would be achieved under normal school advancement without repetition, such as: (the highest grade attained) / (age – 6). The majority of studies reviewed in this paper focus on primary or secondary school attendance or enrollment, which is a necessary but not sufficient condition for school-based learning.

Many of the studies based on cross-sectional data use school enrollment as their dependent variable rather than years of schooling completed because school enrollment is a better indicator of current household investment in a child's schooling. However, testing for differences in school attendance between orphans and non-orphans may underestimate potentially negative impacts of adult or parent mortality on child schooling, because school enrollment itself does not ensure normal school initiation and grade progress. For example, orphans could be disadvantaged in terms of hours of attendance and ultimately achievement and learning outcomes because of lower investments in complementary inputs (sufficient

food and nutrition, health care, text books), greater demand for their time in economic activities, lack of parental attention, and psychological stress. For these reasons, panel measures of changes in years of schooling completed or school advancement are likely to be better measures of a child's cumulative school-based learning. However, widespread availability of cross-sectional survey data such as DHS (and a relative lack of panel household data) has resulted in more studies that test for differences in the enrollment of orphans versus non-orphans.

3.3. Challenges in Assessing the Impact of Adult Mortality or Orphan Status on Child Schooling

One of the main challenges of measuring the effects of adult mortality on child schooling is that mortality from AIDS is not a random event. If other factors which affect child schooling – some observable (household income or wealth) and some unobservable (parental preferences for schooling and their emotional support) – are also correlated with adult mortality, then failure to control for such factors could bias measures of the impact of orphan status (or adult mortality) on schooling. For example, most studies in the earlier years of the epidemic in SSA have found higher HIV incidence rates among individuals with higher income, higher education, and more mobility (Ainsworth and Semali 1998; Gregson, Waddell, and Chandiwana 2001). However, this pattern may be changing in some countries, as research using more recent data from west and east Africa finds that although adults with more education are still more likely to be HIV-positive, associations between wealth and HIV status vary considerably across countries (Fortson 2008).

There is considerable empirical evidence of a strong positive correlation between household wealth and child schooling across the developing world (Filmer and Pritchett 1999). If orphans tend to live in wealthier households, and wealthier households are more likely to send children to school, then a simple cross-sectional comparison of the schooling of orphans and non-orphans may underestimate the potentially negative impact of adult mortality on child schooling. On the other hand, if orphans tend to live in poorer households, then lower relative schooling observed for orphans may capture an education gap that would otherwise exist whether or not they had become orphans, due not to their orphan status but to their household's wealth status. These two examples demonstrate why failure to control for household characteristics such as pre-death household wealth may generate biased estimates of the impact of adult or parental mortality on child schooling.

While DHS and MICS do not collect information on household income or expenditure, they do collect information on the ownership of assets and housing conditions, which can be used to create a wealth index to proxy for household wealth (Filmer and Prichett 2001). Therefore, studies that use cross-sectional data can at best control for post-death household wealth levels. A distinct advantage of studies that use longitudinal data is the ability to use statistical methods that can control for initial household wealth levels, as well as unobserved time-constant factors that may be correlated with both schooling and adult mortality.

A second challenge in measuring the effects of adult morbidity and mortality on child schooling is the timing of impacts, as effects on schooling may occur prior to a death (during the illness period), shortly after a death, and/or years later. A related issue is whether measured differences in schooling indicators such as attendance between orphans and non-orphans are transitory or permanent. That is, if a child is pulled out of school during either the illness or immediate post-death period of an affected adult in their household, does the child

eventually go back to school, and if so, are they able to eventually complete the same years of schooling as non-affected children?

There are several inherent disadvantages in using cross-sectional datasets such as DHS to test for effects of orphan status or adult mortality on child schooling, which are related to the timing of the effects. First, surveys like DHS or MICS only identify the orphan status of a given child, not how recently his/her parent died, and they only observe schooling indicators such as attendance or years completed at one point in time following the parental death. Thus, studies using such data are unable to measure whether or not schooling impacts occur prior to the death – impacts which may include delayed initiation of schooling as well as slower-than-normal school progression. For example, some studies based on longitudinal data have found evidence of negative effects on school attendance during the pre-death period (Yamano and Jayne 2005; Ainsworth, Beegle, and Koda 2005; Mather 2011a), information which is vital to the appropriate timing of mitigation programs. Second, because cross-sectional data typically has no measure of the child's schooling (or household wealth) prior to the death, it is difficult for studies using such data to make causal claims regarding the effect of parental death on child schooling. Third, because studies based on cross-sectional data tend to use school attendance or enrollment as their schooling indicator, it is difficult to know whether a measured gap in attendance between orphans and non-orphans at a given point in time is transitory or permanent (Ainsworth, Beegle, and Koda 2005). Nevertheless, despite the various shortcomings of cross-sectional data for use in assessing schooling impacts of orphan status on children, the prevalence of DHS data across countries and over time has been quite valuable in several multi-country studies of the relationship between orphan status and schooling outcomes.

Some studies using panel data have measured schooling effects during both pre-and post-death periods, and have investigated the issue of whether or not children who are pulled out of school eventually go back. However, even with panel data, it may be difficult to know whether the measured outcomes are transitory or permanent, given that a panel of long duration would be required to answer this question. One exception is a recent study from the Kagera region of Tanzania which uses a unique 10-year panel that enables the authors to investigate whether or not children who are pulled out of school prior to or after a household death are able to eventually complete the same schooling level as other children (Beegle, de Weerdt, and Dercon 2006).

A third challenge in measuring the effects of adult morbidity and mortality on child schooling is that notwithstanding the large and growing numbers of orphans in some SSA countries, the incidence of double-orphans or recent adult morbidity or mortality is quite small. The implication is that surveys with smaller sample sizes will likely not have many sample households with orphans or recent adult mortality unless such households are purposively oversampled, as in a study from Kagera, Tanzania (Ainsworth, Beegle, and Koda 2005). Further discussion of the various methodological challenges related to measuring the effects of adult mortality on socioeconomic outcomes is provided elsewhere (Beegle and de Weerdt 2008).

3.4. Methodological Issues Related to Use of Results from Existing Studies for This Synthesis Paper

While there is some debate among demographers regarding estimates of the number of orphans in SSA, which are derived from demographic/epidemiological models (Grassly et al.

2004), our interest for the purposes of this paper is to assess the prevalence of orphaned children and their living situation. The primary source of this information is household surveys such as DHS, MICS, LSMS, etc., which provide information on orphan status of children in each household, as well as information concerning the people with whom they live.[3] Because the data are from household surveys, they do not include estimates of the number of institutionalized orphans or street-children. However, a recent UNICEF (2006) report concludes that national-level indicators on children orphaned and made vulnerable by HIV/AIDS can effectively be obtained through household-only surveys, thus stating that "it is not necessary to collect and merge data on institution and street children to get national (orphan) indicators."[4]

There are three methodological approaches used by the existing studies that measure differences in the schooling indicators of orphans relative to non-orphans. The first approach uses cross-sectional data to compare attendance rates of orphans (usually of age 7 to 14) with non-orphans in the same age range, using individual-level data from cross-sectional household or school surveys. The second approach also uses cross-sectional data, but uses multivariate regression analysis of the determinants of school attendance to assess the partial effect of orphan status on attendance, while controlling for other factors known to affect attendance, such as the child's age and gender, household wealth level, education level of the head of household, urban/rural residence, and geographic area. The third approach uses panel household data and difference-in-difference estimators that control for pre-death household characteristics and unobserved time-constant heterogeneity, and is able to establish a causal relationship between adult mortality and changes in child schooling.

Among the studies with data on orphan status, most estimate separate effects of paternal, maternal, or double-orphan status. While a few of the studies have information on both adult illness and death, we do not review studies that focus only on the effects of adult illness on child schooling.

The panel study by Himaz (2009) is included with some hesitation given concerns about its sampling and methods. First, it is not clear what the sample represents, though it appears that the sample is predominantly poor given their claim to have purposively over-sampled sites that are known to be food deficient. Second, relatively small sample sizes result in only 19 maternal orphans and 57 paternal orphans. Third, their propensity score matching specification does not include child's age (they instead use height-for-age). Given that age is positively correlated with both orphanhood and schooling in many countries (Ainsworth and Filmer 2006), omitting age indicators from the matching is likely to yield estimates of the effects of orphanhood that are upwardly biased.

Bicego, Rutstein, and Johnson (2003) is not included in the following review because their regression results were not presented for each country separately; they aggregate DHS household data from different countries together by region. This seems inappropriate given the heterogeneity of orphan schooling deficits found by other papers using DHS data in a regression framework (Ainsworth and Filmer 2006; Case, Paxson, and Ableidinger 2004). Sharma (2006) is also not included here, as he does not control for household wealth in his regressions (though he uses the same Malawi dataset as Ueyama (2007). A study based on

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[3] Other sources of data on orphan prevalence come from censuses and demographic surveillance systems.

[4] For example, survey research in Malawi and Jamaica found that in Blantyre, 99% of children classified as OVC live in households, while 0.5% lives in institutions, and 0.1% live on the streets. In Kingston, 98% of children classified as OVC live in households, 2% live in institutions, and less than 0.1% live on the streets.

cross-sectional data from school and student surveys from Botswana, Malawi, and Uganda (Bennel 2005) is also not included given that his measures of orphan schooling deficits do not control for household wealth.

4. SYNTHESIS OF EMPIRICAL FINDINGS

4.1. How Prevalent Are Orphaned Children in Sub-Saharan Africa?

In this section, we review the evidence concerning the prevalence of various types of orphaned children in SSA as well as their living situation. An article that used DHS and MICS data from 40 SSA countries (ranging from 1997 to 2002) found that the median prevalence of orphanhood among children under 15 was 9.2% for the 40 national surveys used (Monasch and Boerma 2004). Three key findings are apparent from their results. First, while there is considerable variation in orphan prevalence across countries, double orphans are actually relatively rare, as they represent only 0.9% of all children and 9.8% of all orphans (Table 1).

Second, there is considerable variation in orphan rates across countries and regions. For example, orphan rates are lower in west Africa (regional medians of 7.2% for total orphans and 0.8% for double orphans) and higher in southern Africa (regional medians of 11.6% for total orphans and 1.5% for double orphans). HIV/AIDS is likely to affect the rate of double orphans disproportionally compared with the increase of single-parent orphans because HIV is sexually transmitted and is more likely to cause the death of both parents than most other conditions. In fact, in countries hit hard by the AIDS epidemic, such as Malawi, Kenya, and Zimbabwe, the fraction of double orphans has increased in the past decade to reach more than 20% (as a percentage of all orphans) (Beegle et al. 2010). Third, paternal orphans were more common than maternal orphans in all countries (with country medians of 5.9% and 1.9%, respectively). Higher paternal than maternal orphanhood prevalence is not an HIV-specific phenomenon, as fathers in SSA are on average older than mothers, and young adult men have higher non-AIDS age-specific mortality rates than young adult women (Hosegood, Vanneste, and Timæus 2004).

Beegle et al. (2010), who investigate the extent to which orphan rates have changed over time, present more recent orphan rates estimated from DHS and MICS data for many of these same SSA countries. They find that in many of the countries studied, the orphan rate has remained relatively stable over time. However, of particular concern is a group of five countries (Kenya, Malawi, Namibia, Zambia, Zimbabwe) which have experienced large increases in their overall and double orphan rates from the early 1990s to the mid-2000s. The most recent average overall orphan rate for these five countries was 15.2%, and the double orphan rate was 2.7%. Various studies (Bicego, Rutstein, and Johnson 2003; Monasch and Boerma 2004; Beegle et al. 2010) have shown a strong correlation between orphanhood prevalence and national adult HIV prevalence, leading to a general consensus that HIV has resulted in a significant increase in orphan rates in some countries.

Table 1. Prevalence of Orphans in 40 Sub-Saharan African Countries

Region	# of countries studied	Any orphans	Paternal orphans	Maternal orphans	Double orphans	Double as % of all orphans
		--------- median country % by country group -------				
West Africa	13	7.2	4.3	1.7	0.8	11.1
Central Africa	7	8.2	5.7	1.8	0.7	8.5
Eastern Africa	10	9.6	6.6	2.6	0.9	9.4
Southern Africa	10	11.6	7.6	2.0	1.5	12.9
sub-Saharan Africa	40	9.2	5.9	1.9	0.9	9.8

Source: Monasch and Boerma, 2004, using DHS and MICS data from 1997 to 2002. Final column computed by author as (double orphans / all orphans)

4.2. With Whom Do Orphans Live?

The extended family has long served as the predominant social safety net mechanism in SSA for children who lose their parents, nearly all of whom are absorbed into their relatives' families (Hosegood 2008). However, there is concern that the numbers of orphans will become so large it will threaten traditional coping mechanisms, such as fostering orphans with extended family (Foster 2000). Evidence of such a breakdown of extended family fostering might include an increase in the prevalence of child-headed households, households with only older adults (such as grandparents[5]), or fostering outside of the extended family (*ibid*. 2000). While one in six households with children in SSA are caring for orphans on average (Monasch and Boerma 2004), the evidence to date suggests considerable resilience among extended families in absorbing orphaned children (Beegle et al. 2010).

First, evidence from multiple DHS and MICS across a wide range of SSA countries does not suggest that child-headed households or street children are becoming more common (Monasch and Boerma 2004). While it is true that households headed by children may be under-represented in households surveys – because normally an adult is required to complete the household questionnaire – cohort studies in Sub-Saharan Africa confirm the relatively low prevalence of child-headed households. For example, Hosegood et al. (2007) find almost no child-headed households in demographic surveillance data from Tanzania, Malawi, and South Africa and no evidence that increases in orphanhood rates are increasing the prevalence of child-headed households in their study sites.

Second, there appear to be few orphans who are fostered outside of the extended family. For example, while there is considerable regional variation in living arrangements of orphans, the majority of single-parent orphans across 40 SSA countries studied by Monasch and Boerma (2004) live with their surviving parent; three out of four paternal orphans live with their mother and just over half of maternal orphans live with their father. The extended family (primarily grandparents) takes care of over 90% of the double orphans (Monasch and Boerma 2004; Ainsworth and Filmer 2002). Using 10 years of cross-sectional nationally-representative surveys from South Africa, Ardington (2008) finds that at every point in time, the vast majority of orphans are still being absorbed into extended families.

Third, although there appear to be few orphans fostered outside the extended family, there are still reasons for concern that living with a caregiver who is not a parent may lead to worse schooling outcomes. For example, in the 21 countries studied by Beegle et al. (2010), grandparents who are caregivers are on average in their mid-60s, which raises concern about the ability of such households (in the event that they do not contain other adults) to physically and financially care for young fostered children. In addition, adults may be willing to invest more in their own children, both because of greater affinity to them (Hamilton 1964) and because they are more likely to receive transfers from their own children later in life. On the other hand, it is also possible that fostering households may be more able to devote resources to a fostered orphan in the event that such households have not incurred the direct and indirect costs of AIDS (Beegle et al. 2010). In other words, some affected households may have the option to place orphans selectively in other households that are relatively wealthier. For example, Urassa et al. (1997) in Tanzania and Zimmerman (2003) in South Africa find evidence that fostering is not clearly associated with worse outcomes for children, and note that motives for fostering can include improving the living standards of children. Likewise,

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[5] Grandparents are often a last resort as caregiver and agree to take orphans because other relatives refuse (McKerrow 1997).

weak geographic coverage of primary or secondary schools may result in households sending children to live with relatives or friends in areas where schools are more readily accessible.

The evidence is mixed related to the issue of whether or not orphan rates are becoming too high and will threaten traditional coping mechanisms. On the one hand, a majority of both double orphans and single orphans not living with their surviving parent live with their grandparents, and fostering households headed by grandparents are relatively more likely to be poor (Beegle et al. 2010). In addition, in their study of 10 SSA countries, Case, Paxson, and Ableidinger (2004) find that orphans in households headed by relatives that are more distant tend to have lower educational outcomes relative to children of the household head. On the other hand, fostering households headed by other relatives (often uncles and aunts) or non-relatives tend to be relatively less poor, which is consistent with selective placement— that is, placing children in relatively better-off households (Beegle et al. 2010). However, there is evidence that 'other relatives' may becoming less able to absorb additional orphans over time, as some countries have seen an increase in the percentage of orphans living with grandparents, especially in countries which have experienced a large increase in orphan rates (Beegle et al. 2010).[6]

4.3. Do Orphans Have Worse Schooling Measures than Non-orphans?

In the next two sections, we consider two related questions. First, do orphans have worse schooling indicators than non-orphans, and secondly, how do orphan schooling deficits compare with schooling deficits between children from poorer and wealthier households?

To investigate the question of whether orphans have worse schooling indicators than non-orphans, we only consider results from studies that have measured the effect of orphan status (or of an adult death in the household) on child schooling using multivariate regression. Each of the studies we review here have controlled for key factors known to influence child school attendance and grade completion, such as the child's age and gender, household wealth status, and geographical dummies (as explained in more detail in section 3). Some of the studies have used cross-sectional data from a number of countries and regions of SSA, while the available studies based on panel data are all from east or southern Africa (Table 2).

Before discussing the findings from these studies, we first note the considerable congruence of results from the largest cross-national study that uses cross-sectional data (Ainsworth and Filmer 2006 – referred to in this section as AF) with those of panel studies from the same country and time period. For example, in Malawi, AF finds evidence of significant negative schooling deficits for maternal orphans in 2000 (but not paternal orphans), while Ueyama (2007) finds the same results using panel data from 2000-2004. Akwara et al. (2010) use cross-sectional data from Malawi for 2004 and find evidence of both maternal and paternal orphan deficits, though those of maternal orphans are considerably larger.

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[6] Beegle et al. (2010) also find important changes in living arrangements (such as a trend toward increased caregiving by grandparents) even in countries with low prevalence levels, where orphan rates are not increasing. Based on these findings, they recommend that these changes and patterns be carefully tracked with subsequent rounds of data, but also that these changes need to be studied more carefully to understand the underlying causes and implications.

Table 2. Are Orphans' Schooling Outcomes Worse than those of Non-orphans or Children from Non-afflicted Households, Controlling for Household Wealth?

Study	Country	Sample / Source	Survey Years	Findings
Studies which use longitudinal data				
Himaz 2009	Ethiopia	20 sentinel sites in 5 regions	2002, 2006	Among relatively poor households, maternal death reduces school enrolment by 21 percent; no effect of paternal death
Yamano and Jayne 2005	Kenya	Rural households from 24 districts across all 8 agroecological zones	1997, 2000, 2002	33% lower attendance for poor boys and girls prior to WA death, 9% lower attendance for poor boys following WA death
Evans and Miguel 2007	Kenya	Busia district	1998-2002	6% lower schooling attendance 1-2 years prior to maternal death, 9% lower attendance after a maternal death
Ueyama 2007	Malawi	Nationally representative	2000, 2004	Maternal orphan boys age 12-18 have significantly lower attendance, as do double orphan boys age 6-18. No significant effects on attendance of orphan girls. Lower attendance following recent maternal death; no significant effect of recent paternal death.
Mather 2011a	Mozambique	Nationally representative, rural	2002, 2005	WA male death 0-3 years ago reduces attendance 21% among poor children; chronically ill WA male reduces attendance by 25%; WA female death 0-3 years ago reduces attendance by 12% for less poor children, and reduces school advancement by 10% among poor children; double-orphans have 16% lower attendance, while who are also poor have 28% lower attendance; maternal orphans have 12% lower school advancement and poor maternal orphans have 12% lower attendance; less poor paternal orphans have 17% lower attendance
Case and Ardington 2006	South Africa	Umkhanyakude District, KwaZulu-Natal	2001, 2003-2004	Maternal orphans are on average 0.24 of a year behind in their schooling and have 7% less spent on their educations, and have an enrolment deficit of 1.7%. Double orphans are on average 0.28 of a year behind on schooling and have enrolment deficit of 2.6%.
Yamauchi et al. 2006	South Africa	KwaZulu-Natal province	1998, 2004	Girls age 14-19 more likely to drop out of school due to future WA death. No significant effects on boys.
Ainsworth et al.2005	Tanzania	Kagera region	1991-1994	Delay in initiation of schooling for maternal orphans (but not paternal orphans); lower hours in school for girls during 6 months following maternal death; no significant effects on older children age 11-14
Beegle et al. 2006	Tanzania	Kagera region	1991-1994, 2004	Maternal orphans age 19-28 years old permanently lose 0.9 years of schooling on average; paternal orphans age 11-18 lose on average 0.4 years of schooling.

Notes: All studies use multivariate regression analysis to estimate the effect of orphan status or adult death on child schooling, controlling for the age and gender of the child as well as household wealth. WA=working age (15-59)

Table 2, (Continued)

Study	Country	Sample / Source	Survey Years	Findings
Deininger et al. 2003	Uganda	Nationally representative	1992, 2000	Orphans not living with a biological parent had lower primary and secondary school attendance in 1992, but there was no orphan attendance gap in 2000 for either primary or secondary school.
Yamano et al. 2006	Uganda	Representative of two-thirds of the country	1999-2001, 2003	Among children aged 7–14, no significant difference in school enrollment between orphans and non-orphans; double orphan girls age 15-18 are less likely to be in school relative to non-orphans.
Mather 2011b	Zambia	Nationally representative, rural	2004, 2008	Chronically ill head/spouse reduces attendance by 4.1%; chronically ill male adult reduces girls' attendance by 8.5%; recent WA death reduces girls' attendance by 7.9%. No significant negative effects of orphan status on attendance or school advancement.

Studies which use cross-sectional data

Study	Country	Sample / Source	Survey Years	Findings
Lloyd and Blanc 1996	7 from SSA	7 DHS	1991 to 1993	In 2 of 7 countries, maternal death has a significant negative effect on enrollment; in 2 of 7 countries, paternal death has a significant negative effect on enrollment.
Case et al. 2004	10 from SSA	19 DHS	1992 to 1999	5-7% lower attendance for paternal orphans in 10 of 19 surveys, and for maternal orphans in 7 of 19 surveys. An average of 15% lower attendance for double orphans in 17 of 19 surveys.
Ainsworth and Filmer 2006	34 from SSA	70 DHS, MICS, IHS	1992 to 2003	While some countries have a large deficit in enrollment among orphans, in many this deficit is small or not statistically different from zero. In West/Central Africa, half the surveys find a significant orphan schooling deficit; in Southern/Eastern Africa, about two-thirds of the surveys find a significant orphan schooling deficit. Schooling deficit of double orphans tends to be larger than those of single-parent orphans.
Akwara et al. 2010	8 from SSA	8 DHS, MICS	2003 to 2006	In 6 of 8 countries, lower schooling attendance for paternal orphans; in 4 of 8 countries, lower schooling for maternal orphans. In 4 of 8 countries, lower schooling attendance due to chronically ill adult in the household.

Notes: All studies use multivariate regression analysis to estimate the effect of orphan status or adult death on child schooling, controlling for the age and gender of the child as well as household wealth. DHS=Demographic & Health Surveys; MICS = Multiple Indicator Cluster Surveys; IHS = Integrated Household Survey

In Kenya, AF finds evidence of negative schooling deficits for both paternal and maternal orphans in 1998, the same finding as that by a panel data study from Busia district from 1998-2002 (Evans and Miguel 2007). In Uganda, both AF and a panel data study (Deininger, Garcia, and Subbarao 2003) find evidence of statistically significant negative orphan schooling deficits in the early 1990s, yet evidence of small or insignificant deficits after 2000 (one of AF's datasets from 2000 finds relatively small paternal and maternal orphan deficits while the other does not). A second panel study from Uganda from 2001-2003 also finds no significant schooling deficit among orphans in primary school (Yamano, Shimamura, and Sserunkuuma 2006).

In South Africa, a country with a high non-orphan enrollment rate of 92% in 1998, AF finds small and insignificant enrollment deficits for paternal and maternal orphans and a 7% deficit for double orphans. In the Kwazulu-Natal province, Case and Ardington (2006) use panel data from 2001-2004 and find significant enrollment deficits for maternal and double orphans, though they are relatively small (1.7% and 2.6%). In Tanzania, AF finds no significant paternal orphan enrollment deficit in 1991 and a 5% deficit (though insignificant) among maternal orphans, which is consistent with Ainsworth, Beegle, and Koda (2005), whose panel study from the Kagera region 1991-1994 finds significant schooling effects from maternal but not paternal deaths. The panel study from Ethiopia (Himaz 2009) using data from 2002-2006 finds evidence of enrollment deficits for maternal but not paternal orphans, while DHS data from 2000 finds enrollment deficits for both. Though AF and a panel study from Mozambique (Mather 2011a) cover different time periods, both find large significant enrollment deficits for double orphans. By contrast, in the case of Zambia, AF finds significant enrollment deficits for maternal and double orphans, while a panel study (Mather 2011b) finds no evidence of enrollment deficits among orphans.

The findings of the reviewed studies demonstrate that there is a considerable degree of heterogeneity in the effects of orphan status or adult mortality on child schooling in SSA (Table 2). For example, several of the multi-country studies find that while orphan schooling deficits are relatively large and significant in some countries, in many countries the deficits are relatively small or not statistically different from zero (Lloyd and Blanc 1996; Ainsworth and Filmer 2006). Second, in countries where orphan schooling deficits are statistically significant, it is clear that in most cases, there is a considerably larger schooling deficit for double orphans relative to single-parent orphans (Case, Paxson, and Ableidinger 2004; Ainsworth and Filmer 2006).

Third, among the countries where an orphan schooling deficit appears to exist, the statistical significance and magnitude of the deficit often vary considerably by characteristics of the child (gender), the deceased adult (gender or household position), and the household (wealth level). For example, in Malawi, orphan boys suffer statistically significant negative schooling effects while effects on orphan girls are insignificant (Yamauchi, Buthelezi, and Velia 2006). By contrast, girls in Tanzania are more likely to spend lower hours in school in the months following an adult death in the household (Ainsworth, Beegle, and Koda 2005). With respect to the gender or household position of the deceased adult, there are significant negative schooling effects on maternal orphans but not paternal orphans in Tanzania (Ainsworth, Beegle, and Koda 2005). In Mozambique, the recent WA death of either a male or a female adult may lead to lower attendance, yet negative schooling impacts during the illness period are only found in the case of chronically ill male adults (Mather 2011a). In Zambia, significant negative effects are found from chronically ill heads-of-household or spouses, but not from chronically ill non-head/spouse adults (Mather 2011b). Another source of heterogeneity is variation in schooling effects by initial household wealth status and over time. For example, in Kenya, there are significant negative schooling effects of adult

mortality on children from households that were relatively poor prior to the death, but none on children from *ex ante* wealthier households (Yamano and Jayne 2005). Likewise, in Zambia, negative schooling effects are more likely to be significant and are of larger magnitude among children from *ex ante* poorer households (Mather 2011b).

In general, these results demonstrate that the extent to which orphans are under-enrolled relative to other children is country-specific, and that among orphans, those who have lost both parents are considerably more likely to have statistically significant schooling deficits (and of larger magnitude) than single-parent orphans. These results suggest that it is inappropriate to categorize all children who are directly or indirectly affected by HIV/AIDS-related morbidity and mortality as being especially vulnerable to under-enrollment and in need of targeted school subsidies and that policymakers need to tailor mitigation measures to the specific situation in each country.

4.4. How Do Orphans' Schooling Measures Compare with those of Children from Non-afflicted but Poor Households?

Lloyd and Blanc (1996) were the first to present evidence that the schooling disadvantage faced by children from poor households tended to be considerably larger than that faced by orphans. In their multi-country study based on DHS data from seven SSA countries, they estimated child enrollment deficits due to orphan status as well as other factors, and found that "the survival status of parents is much less important to children's current participation and progress in school than other family characteristics (such as household wealth)" (*ibid.* 1996). Ainsworth and Filmore (2002) continued this line of inquiry with more recent data from 22 SSA countries. Using bivariate statistics, they found that all but a few countries have sharp differentials in enrollment between children in poor and non-poor households, which in many cases are considerably larger than average schooling deficits between orphans and non-orphans. The results of these two studies beg the question of whether orphans are the most vulnerable children in SSA with respect to schooling. In this section, we review studies that have either estimated schooling deficits by wealth level (comparing them with orphan schooling deficits) or assessed whether the magnitude or significance of orphan schooling deficits varies by household wealth level (Table 3).

Using DHS/MICS/IHS data from 34 SSA countries, Ainsworth and Filmer (2006) use multivariate regression to estimate schooling differentials for different kinds of orphans as well as for children from different wealth quintiles. They note that the schooling gap for single-parent orphans is considerably smaller than that of double-orphans, and that while orphan schooling deficits are somewhat large in some countries, they are quite small or insignificant in many SSA countries. They also demonstrate that school attendance gaps between poorer and wealthier non-affected children are often two to three times larger than single-parent orphan schooling gaps, and in most cases as large as the double-orphan gap. Akwara et al. (2010) perform similar analysis using more recent DHS/MICS data from eight SSA countries. Their results suggest that enrollment deficits across different quintiles of household wealth are considerably larger than deficits due to paternal or maternal orphan status.

Table 3. How Do Orphans' Schooling Outcomes Compare with those of Children from Non-afflicted but Poor Households?

Study	Country	Findings
Yamano and Jayne 2005	Kenya	33% lower attendance for poor boys and girls prior to WA death, 9% lower attendance for poor boys following WA death (no significant effects of adult mortality on children from non-poor households).
Evans and Miguel 2007	Kenya	No significant difference in effects of parent death on school attendance by household wealth level.
Mather 2011a	Mozambique	Among poor children, WA male death 0-3 years ago reduces attendance 21%, a chronically ill WA male reduces attendance by 29%, double-orphans have 28% lower attendance; and maternal orphans have 12% lower attendance.
Mather 2011b	Zambia	Among children from poor households, recent WA death reduces girls' attendance by 12.5%.
Lloyd and Blanc 1996	7 from SSA	Enrollment deficits due to household wealth status are 2-4 times larger than those for orphan status, except for Malawi
Case et al. 2004	10 from SSA	Did not estimate enrollment deficits by wealth status, though they did not find evidence that orphan gaps are larger among poorer households.
Ainsworth and Filmer 2006	34 from SSA	In nearly all countries the size of the paternal and maternal orphan enrollment gap is dwarfed by the gap in enrollment between poorer and richer children. In a majority of countries, the double orphan gap is also smaller than the wealth gap.
Ankwara et al. 2010	8 from SSA	Enrollment gap across different wealth quintiles is considerably larger than enrollment gap due to paternal or maternal orphan status.

Notes: WA = working age adult (15-59)

Case, Paxson, and Ableidinger (2004) use DHS data from 10 SSA countries between 1992 and 2000 to estimate the impact of parent death on school enrollment. They find evidence of schooling deficits for paternal orphans in 10 of the 19 country-years and for maternal orphans in 7 of 19 country-years for maternal orphans; the significant single-orphan deficits range from 5.7% to 7%. For the majority of countries, double orphans are estimated to be between 10 and 30 percentage points less likely to be in school (with an average of 15%).

Because their regressions control for household fixed effects (and thus household wealth), they conclude that although poorer children in Africa are less likely to attend school, orphan schooling deficits exist irrespective of household wealth status. While closer inspection of their methods raises some questions about the robustness of their results,[7] it bears noting that their results are similar to those of Ainsworth and Filmer (2006). For example, both studies find evidence of significant orphan attendance deficits in some countries and not others, and both find single-parent orphan deficits that average 5-7%. Yet, the single-parent orphan

[7] Using the full sample from each case country, they first run regressions which do not control for household wealth. Secondly, they then employ a household fixed-effects estimation strategy which compares orphans and non-orphans in the households that take in orphans. However, because the only cases used are children from these 'blended' households, the representativeness of these results are not clear, especially if orphans are strategically placed in better-off households within the extended family, as was found in the case of aunts/uncles who take in orphans (Beegle 2010).

deficits found in both studies are considerably smaller than those found by Ainsworth and Filmer (2006) for children from relatively poor households.

None of the studies based on panel data have tested for schooling deficits between different household wealth levels. However, four of them tested whether or not the effects of adult mortality varied by household wealth status. In Kenya, Yamano and Jayne (2005) found that negative effects of adult mortality on child schooling were only significant among households in the bottom half of the (pre-death) wealth distribution. Evans and Miguel (2007) did a similar test but found that negative effects of parental death on school attendance were significant for both wealthier and poorer households. The incongruence on this matter between the two Kenya studies may be due to different geographic nature of their samples (the former covers much of rural Kenya, while the latter only includes Busia district). In Mozambique, the effects of adult mortality on attendance are of larger magnitude and more likely to be significant for children from poorer households (Mather 2011a). Likewise, in Zambia, the effects of adult mortality and morbidity on girls' attendance are of larger magnitude and more likely to be significant for girls from poorer households (Mather 2011b).

More evidence for the role of household wealth as the principal determinant of child schooling is found in observing how orphan schooling gaps change over time as overall enrollment rises. For example, among countries with multiple years of survey data, Ainsworth and Filmer (2006) find nine countries in which the enrollment for non-orphans increased by 10 percentage points or more between the first and last surveys studied. In virtually all cases, they find that the enrollment among orphans increased by almost as much or more than the enrollment increase among non-orphans. The reason for these large increases in overall enrollment appears to be the recent abolition of primary school fees in these countries. For example, in Malawi, DHS data from 1992 show that the non-orphan enrollment rate was 64.6%, with deficits for paternal (-9.3%), maternal (-16.8%), and double orphans (-24%). A few years after the abolition of primary school fees, the non-orphan enrollment rate increased 18 points to 82.5%, while the deficits for paternal (-2.4), maternal (-6.0) and double orphans (-3.1) fell dramatically (Ainsworth and Filmer 2006).

A similar improvement is seen in Uganda, where DHS data shows a 14% increase in overall enrollment following the abolition of primary school fees in 1996, and significant reductions in orphan schooling deficits (Ainsworth and Filmer 2006). This concurrent improvement in overall schooling and that of orphans is also found by a study based on panel data (Deininger, Garcia, and Subbarao 2003), which finds evidence of orphan schooling deficits in 1992 yet not in 2000. A second panel study from Uganda also finds no significant negative schooling deficit among orphans in primary school from 2001-2003 (Yamano, Shimamura, and Sserunkuuma 2006).

The most recent DHS and MICS data finds that in 14 of 16 SSA countries that have an HIV prevalence of 2% or more, and in which survey-based trend data are available, the level of school attendance among orphans 10 to 14 years old has increased to near parity with the school attendance of children whose parents are both alive and who are living with one or both parents (UNICEF 2010). There is also recent evidence from DHS and MICS (from 2003 to 2008) that double-orphan enrollment deficits have decreased substantially in 27 out of 31 SSA countries which have data from at least two points in time; the largest reductions are found in Ethiopia, Kenya, Malawi, and Tanzania (UNICEF 2009). Further research is warranted to document these recent improvements in orphan schooling and to determine the role played by elimination of school fees relative to targeted educational assistance to orphans.

However, the absence of school fees is not necessarily a panacea for orphan schooling in every country. For example, although overall enrollment increased dramatically in Zambia after the abolition of primary schooling fees, some children in households that suffered adult morbidity or mortality still experienced schooling losses (Mather 2011b). Even in countries that have abolished primary school fees, there may still be barriers to enrollment such as continued household demand for child labor, additional educational expenses for transport, school uniforms and books, and declining school quality if enrollment outpaces new school construction and teacher hiring.

In summary, the studies which estimate attendance gaps across household wealth categories as well as by orphan status find that the gaps between poorer and wealthier non-affected children are often much larger than schooling gaps of single-parent orphans, and in most cases as large as the double-orphan gap. These results suggest that in many SSA countries, the 'most vulnerable' children with respect to schooling indicators are double-orphans and children from the poorest 20-40% of all households.

4.5. Do Orphan Schooling Deficits Vary by the Gender or Household Position of the Deceased Parent or Adult?

There are various reasons why the gender of a deceased parent or adult might affect the impact of that adult's death on a child's schooling. First, we might expect to find larger schooling effects from a maternal death given evidence from intra-household expenditure surveys showing that female-headed households spend a larger percentage of the household budget on children than male-headed households do (Bruce and Lloyd 1997). On the other hand, the loss of a male household head or male adult may well result in a larger loss of cash income for the surviving family members, given that men are more likely than women to have higher-wage employment or manage cash crops in many SSA countries. Likewise, research from Kenya and Mozambique found that the loss of a household head or spouse resulted in a larger loss of farm assets and cash income for the surviving family members, relative to the loss of a non-head/spouse (Yamano and Jayne 2005; Mather and Donovan 2007).

How one-parent orphans fare after the death of a parent likely has a lot to do with their living situation after the death; that is, does the single-parent orphan continue to live with their surviving parent, or are they moved to another household?

Ainsworth and Filmer (2006) find that schooling deficits of maternal orphans tend to be larger than those of paternal orphans in east and southern Africa, which is consistent with most of the panel studies from these regions (Table 4). For example, studies from Ethiopia (Himaz 2009), Kenya (Evans and Miguel 2007), Malawi (Ueyama 2007), and South Africa (Case and Ardington 2006) find significant schooling deficits among maternal but not paternal orphans. In Mozambique, schooling deficits are found for maternal orphans as well as for paternal orphans from less poor households (Mather 2011a). While schooling deficits were found to be significant for both maternal and paternal orphans in Tanzania (Beegle, de Weerdt, and Dercon 2006), those of maternal orphans were larger. An explanation for why maternal orphans have poorer schooling outcomes is suggested by Ueyama (2007), who finds that children in Malawi who lose a mother (as well as double orphans) are more likely to be moved to another household following the death. Thus, maternal orphans would be less likely to live with a surviving parent than paternal orphans, consistent with results from other countries in Ainsworth and Filmer (2006).

Table 4. Do Schooling Impacts on Orphans Vary by the Gender or Household Position of the Deceased Adult or Parent?

Study	Country	Findings
Himaz 2009	Ethiopia	Among relatively poor households, maternal death reduces school enrolment by 21 per cent; no effect of paternal death
Evans and Miguel 2007	Kenya	6% lower schooling attendance 1-2 years prior to maternal death, 9% lower schooling after a maternal death
Ueyama 2007	Malawi	Negative effect on schooling from death of child's mother – no effect from death of child's father
Mather 2011a	Mozambique	WA male death 0-3 years ago reduces attendance by 21% among poor children; chronically ill WA male reduces attendance by 25%; WA female death 0-3 years ago reduces attendance by 12% for less poor children, and reduces school advancement by 10% among poor children from poor households. Maternal orphans have 12% lower school advancement; poor maternal orphans have 12% lower attendance; less poor paternal orphans have 17% lower attendance.
Case and Ardington 2006	South Africa	Negative effects on schooling for maternal orphans (but not paternal orphans)
Ainsworth et al.2005	Tanzania	Delay in initiation of schooling for maternal orphans (but not paternal orphans); lower hours in school for girls during 6 months following maternal death
Beegle et al. 2006	Tanzania	Negative effects on schooling for maternal orphans; smaller effects for paternal orphans
Mather 2011b	Zambia	Chronically ill head/spouse reduces attendance by 4.1%; chronically ill male adult reduces attendance of girls by 8.5%
Ainsworth and Filmer 2006	34 from SSA	Though they do not test for such differences, maternal orphan gaps appear to be slightly larger than paternal gaps in many countries in East/Southern Africa; cases from West/Central Africa show some countries with larger paternal gaps and others with larger maternal gaps.
Ankwara et al. 2010	8 from SSA	No systematic difference between maternal or paternal death in 4 of 8 countries; larger negative schooling effects from maternal death in Malawi and Zimbabwe; larger effects from paternal death in Mali and Tanzania

Notes: WA = working age adult (15-59)

An exception to this pattern is found in Zambia (Mather 2011b), where there is apparently no difference in attendance deficits by gender of the deceased adults, although deficits due to adult morbidity are found in the case of a chronically ill head/spouse or male adult (but not in the case of non-head/spouses or female adults). Another exception is Mozambique; while there is evidence of attendance deficits for both maternal and paternal orphans, most of the significant effects of adult mortality and morbidity on attendance are due to the death or illness of adult males (Mather 2011a). Results from west and central Africa are more mixed, as Ainsworth and Filmer (2006) found some countries that had larger schooling deficits for maternal orphans relative to paternal orphans, while countries such as Ghana had larger deficits for paternal orphans (Table 4).

4.6. Is the Gender Gap in Schooling Larger for Orphans?

While there has been recent progress toward gender parity in child schooling in many SSA countries (UNESCO 2010), boys continue to enjoy higher school enrollment than girls in some countries. Given this context, there are concerns that the schooling of girls who are orphaned may suffer more than the schooling of boys who are orphaned, exacerbating existing inequalities in male–female schooling progress (Subbarao, Mattimore, Plangemann 2001; World Bank 2002; IATT 2009). There are two main reasons why the schooling progress of girls might be more affected than that of boys during the illness or following the death of an adult in the household. First, girls may be more likely to serve as caretakers to adults during the illness period. Second, in the event that the ill or deceased adult is female, girls are also more likely to be given the ill/deceased woman's former domestic chores, such as caring for younger siblings and performing other domestic tasks (cooking, fetching water/firewood, etc.).

The multi-country studies by Ainsworth and Filmore (2006) and Case, Paxson, and Ableidinger (2004) both find that the gender schooling gap is not larger for orphans in most countries (Table 5). This result is also found in the panel studies from Kenya (Evans and Miguel 2007) and Mozambique (Mather 2011a). However, there are cases where it appears that girls bear more of the burden of the loss of a deceased adult than do boys, as studies from Uganda (Yamano, Shimamura, and Sserunkuuma 2006) and South Africa (Yamauchi, Buthelezi, and Velia 2006) find negative schooling effects of adult mortality only for girl orphans. In Zambia, negative impacts of WA mortality on girls' schooling are larger in magnitude than those for boys, and are significant for girls from both poor and less-poor households (while insignificant for boys) (Mather 2011b). Only in Malawi do we find negative schooling effects of adult mortality on boys but not girls (Ueyama 2007).

In summary, contrary to the claims from some observers, girl orphans do not appear to suffer worse schooling deficits than boy orphans in most countries, and there is at least one country (Malawi) where boy orphans fare worse than girl orphans. However, there are some countries in east and southern Africa where girls do appear to be more susceptible than boys to schooling losses due to adult mortality.

4.7. Timing of Effects of Adult Morbidity and Mortality on Child Schooling

One area in which most observers appear to agree is that the potential for negative effects of adult morbidity and mortality on child schooling may occur at various times. For example, a child in a household with a chronically ill adult may drop out of school to serve as a caretaker for the ill adult, to substitute for the ill adult in farm or household chores, or because of financial constraints due to medical expenses. After the adult's death, the child may still need to substitute for that adult's lost labor in income-generating activities; funeral expenses may cause financial constraints to attending school, and psychological and emotional stress of losing a parent or relative may cause poor school performance. Even years after the death, a poor household may face financial constraints and labor demands, which make it difficult for the child to continue with school.

Table 5. Is the Gender Gap in Schooling Larger among Orphans?

Study	Country	Findings
Evans and Miguel 2007	Kenya	No difference in schooling effects on orphans based on the orphan's gender
Yamano & Jayne 2005	Kenya	33% lower attendance for poor boys and girls prior to WA death, 9% lower attendance for poor boys following WA death
Ueyama 2007	Malawi	Negative schooling effects on orphaned boys, not orphaned girls
Mather 2011a	Mozambique	Both boys and girls susceptible to lower attendance due to past period or recent WA deaths. Both male/female double-orphans in poor households have lower attendance, and both male/female maternal orphans have lower school advancement.
Yamauchi et al. 2006	South Africa	Girls age 14-19 more likely to drop out of school due to future WA death. No significant effects on boys.
Ainsworth et al. 2005	Tanzania	Delay in initiation of schooling for maternal orphans (both boys and girls); lower hours in school for girls during 6 months following maternal death
Beegle et al. 2006	Tanzania	No difference in long-term schooling effects on orphans based on the orphan's gender
Yamano et al. 2006	Uganda	Girls age 15-18 who are double-orphans less likely to be in school relative to non-orphans
Mather 2011b	Zambia	Negative impacts of WA mortality on girls' schooling are larger in magnitude than those for boys, and are significant for girls from both poor and less-poor households (while insignificant for boys).
Case et al. 2004	10 from SSA	In most cases, the gender schooling gap is not larger for orphans
Ainsworth and Filmer 2006	34 from SSA	In most cases, the gender schooling gap is not larger for orphans

Notes: WA = working age adult (15-59)

Six of the studies which use panel data measured the effect of adult mortality on child schooling during both the pre- and post-death periods, as did one of multi-country studies using cross-sectional data (which measures pre-death attendance deficits from households with a chronically ill adult, and post-death attendance deficits among orphans) (Table 6). In most cases, negative schooling effects were found in both pre- and post-death periods, including Kenya (Yamano and Jayne 2005); Mozambique (Mather 2011a); Zambia (Mather 2011b); Cameroon, Malawi, and Zimbabwe (Akwara et al. 2010). Only in Tanzania (Ainsworth, Beegle, and Koda 2005) and South Africa (Yamauchi, Buthelezi, and Velia 2006) were effects found only in the post-death period.

While the studies based on panel data were able to test for evidence of schooling losses both before and after an adult death, it should be noted that the time periods covered by many of these panel studies are probably not long enough to measure the full potential losses in schooling due to adult mortality. On the other hand, these studies also cannot test for certain whether or not losses in child schooling detected within the panel time period are transitory or permanent; that is, are children who fall behind in school or drop out able to go back to school at some point? If so, are they eventually able to achieve the same schooling progress as other children? As noted above, a study from the Kagera region of Tanzania uses a unique 10-year panel which enables the authors to investigate whether or not children who are pulled out of school prior to or after a household death are able to eventually complete the same schooling level as other children (Beegle, de Weerdt, and Dercon 2006). They found that maternal orphans permanently lose 0.9 years of schooling on average, while paternal orphans permanently lose 0.4 years of schooling.

Table 6. When Do Effects of Adult Mortality on Child Schooling Occur – during the Period of Adult Illness, Post-Death, or Both?

Study	Country	Findings
Evans and Miguel 2007	Kenya	6% lower schooling attendance 1-2 years prior to maternal death, 9% lower attendance after a maternal death
Yamano and Jayne 2005	Kenya	33% lower attendance for poor boys and girls prior to WA death, 9% lower attendance for poor boys following WA death
Mather 2011a	Mozambique	Lower attendance caused by WA female death 3-6 years ago, WA male death 0-3 years ago, and/or current chronically ill male adult
Yamauchi et al. 2006	South Africa	Girls age 14-19 more likely to drop out of school prior to WA death
Ainsworth et al. 2005	Tanzania	Delay in initiation of schooling for maternal orphans (but not paternal orphans); lower hours in school for girls during 6 months following maternal death
Mather. 2011b	Zambia	Lower attendance caused by WA death 0-2 years ago or current chronically ill head/spouse or male adult
Ankwara et al. 2010	8 SSA	In 6 of 8 countries, lower schooling attendance for paternal orphans; in 4 of 8 countries, lower schooling for maternal orphans. In 4 of 8 countries, lower school attendance due to chronically ill adult in the household.

Notes: WA = working age adult (15-59)

5. CONCLUSIONS

There is growing concern that the HIV/AIDS epidemic may reduce long-term human capital development through reductions in child schooling in SSA, thus severely limiting the long-term ability of orphans and their extended families to escape poverty. In response, some have called for targeted schooling subsidies for orphans and other children made vulnerable by HIV/AIDS, on the assumption that such children are under-enrolled. This paper reviews the empirical evidence on the effects of orphan status or adult mortality on child schooling, as well as the prevalence of orphans in SSA and their living arrangements.

As portrayed by media and some donor reports, the term 'AIDS orphan' often elicits the image of a child who has lost both parents to AIDS, and who either lives in a child-headed household, a household headed by grandparents who cannot afford to send them to school, or in an orphanage. While children in such circumstances are very likely to be vulnerable to poverty and poor schooling outcomes, empirical evidence shows that in most SSA countries, about 90% of orphans have a surviving parent, that a majority of these single-parent orphans live with their surviving parent, and that child-headed households are extremely rare. While a few countries (Kenya, Malawi, Namibia, Zambia, and Zimbabwe) continue to experience growth in their overall orphan rates (as well as having the highest rates of double-orphans), orphan rates have remained relatively stable in most SSA countries in the past decade (Beegle et al. 2010). In addition, while on average one in six households with children in SSA are caring for orphans, the evidence to date suggests considerable resilience among extended families in absorbing orphaned children. However, there are signs that this is becoming more difficult in some countries (those with rapidly increasing orphan rates), as an increasing number of double-orphans and single-orphans not living with a surviving adult are living with grandparents who tend to be relatively poor.

The findings of the studies reviewed in this paper demonstrate that there is considerable heterogeneity in the effects of orphan status or adult mortality on child schooling in SSA. The bulk of the evidence demonstrates that the extent to which orphans are under-enrolled relative to other children is country-specific, and very often specific to certain kinds of orphans. For example, several of the multi-country studies find that while orphan schooling deficits are relatively large and statistically significant in some countries, in other countries orphan schooling deficits are relatively small or not statistically different from zero. In addition, children who have lost both parents are considerably more likely to have statistically significant schooling deficits (and of larger magnitude) than single-parent orphans. Among the countries where an orphan schooling deficit appears to exist, the existence and magnitude of schooling deficits sometimes vary considerably by characteristics of the child (gender), the deceased adult (gender or household position), and the household (wealth level). For example, in some countries, schooling deficits are only found among female and not male orphans, among maternal and not paternal orphans, or among orphans in relatively poor households but not those from wealthier households. In addition, in most countries, the gender schooling gap is not worse among orphans.

Second, the findings from three large multi-country studies demonstrate that household wealth is a much better predictor of poor child schooling than orphan status in most SSA countries. For example, these studies find that school attendance gaps between poorer and wealthier non-orphan children are 2-3 times larger than single-parent orphan schooling deficits in most countries, and in most cases as large as the double-orphan deficit. Third, it is clear from several of the studies that the school enrollment of orphans relative to non-orphans may change significantly over time within a given country, either for the better in the case of

abolition of primary school fees, or for the worse if orphan rates increase dramatically over time. Fourth, the studies based on panel data also show that negative effects of orphan status or adult death on child schooling may occur during the pre-death illness period, after the death of the parent or adult, or both.

There are several policy implications from these results. First, because the extent to which orphans are under-enrolled relative to other children is country-specific, social protection and education policymakers concerned with primary school under-enrollment need to tailor mitigation measures to the specific needs and situation of each country. Second, the results also imply that it is inappropriate to categorize all children who are directly or indirectly affected by HIV/AIDS-related morbidity and mortality as being especially vulnerable and in need of targeted school subsidies. Use of orphan or OVC status alone as an indicator of poor schooling is often inappropriate, as the children facing the biggest schooling deficits in many SSA countries are double-orphans and children from the poorest 20-40% of households. Therefore, in assessing the nature and scope of the orphan crisis in SSA, it is important to differentiate among the needs of different types of orphans, as important subtleties are lost when reports that cite the number of orphans in SSA do not differentiate between fatherless, motherless, or wholly parentless children (Meintjes and Giese 2006). For example, in shaping an appropriate response to poor schooling outcomes in SSA, it is important to note that of the 56.1 million estimated children in SSA age 0-17 who have lost one or both parents (approximately 14.9 million of which are due to AIDS-related mortality, as estimated by UNAIDS [2010]), approximately 50 million of these children can be anticipated to have a surviving parent.

Third, in countries with relatively low levels of primary school enrollment, targeting children from poorer households with schooling subsidies should improve the enrollment and schooling progress of children most likely to suffer from poor schooling, both orphan and non-orphan alike (Ainsworth and Filmore 2006). Some countries have already gone further than this by eliminating primary school fees for all children. Evidence from Malawi and Uganda suggest that improvements in enrollments among the poor through universal abolition of primary school fees can substantially raise the enrollment of orphans, even to the point of eradicating orphan schooling deficits (*ibid*. 2006). In addition, the most recent DHS data show that orphan attendance rates are nearly on par with non-orphans in many SSA countries, and that double-orphan schooling deficits in many countries have fallen dramatically (UNICEF 2010). Future research could usefully document these enrollment improvements and investigate the role of abolition of primary school fees relative to subsidies targeted to orphans in explaining the apparent improvements in primary enrollment among orphans.

Fourth, even in countries that have abolished primary school fees, there may still be barriers to enrollment such as continued household demand for child labor, additional educational expenses for transport, school uniforms and books, and declining school quality if enrollment outpaces new school construction and teacher hiring. These additional barriers to enrollment may explain why adult mortality was found to result in child schooling losses in Zambia, even during a period after the government had abolished primary school fees. In addition, targeted schooling subsidies alone may not reduce schooling deficits of some orphans, in the event that their poor schooling progress is due to the emotional and psychological trauma of losing one or both parents or a lack of interest by their adult guardians in their schooling. A range of programs have recently delivered assistance to OVCs in a number of SSA countries, including not only school-related subsidies but also health services for HIV-infected children, grief counseling, and other economic support. Future research could usefully document the

coverage of these programs and measure their effectiveness in improving orphans' school attendance and progress.

Fifth, the timing of the negative effects of adult mortality on child schooling implies a potential dilemma with respect to targeted assistance to orphans. On the one hand, in many countries, it would likely be inefficient for policymakers to target school subsidies to single-parent orphans, as many of these children would likely attend school in the absence of a subsidy. Yet, if policymakers were to target assistance instead to only children who had lost both parents, such children would likely have already incurred schooling losses that might be difficult to make up later. In a situation where school fee abolition is not possible for either the poorest children or universally, policymakers intent on targeting schooling subsidies to OVCs may thus want to focus on two-parent orphans, as well as single-parent orphans in poor households where the surviving parent is either non-resident or chronically ill.

Finally, it should be noted that because of the well-established positive correlation between educational attainment and safer sexual behavior (World Bank 1999), Education for All is itself an important policy that can help reduce the spread of HIV/AIDS.

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