Orphans' household circumstances and access to education in a maturing HIV epidemic in eastern Zimbabwe

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ABSTRACT

Levels of orphanhood and patterns of different forms (i.e.: double, paternal and maternal) of orphanhood will change as an HIV epidemic progresses. The implications of different forms of orphanhood for children's development will also change as the cumulative impact of a period of sustained high morbidity and mortality takes its toll on the adult population. In this article, we describe patterns of orphanhood and orphans' educational experience in populations in eastern Zimbabwe subject to a major HIV epidemic which is maturing into its endemic phase. Levels of orphanhood have grown recently but rates of maternal and double orphanhood, in particular, are likely to continue to increase for several years to come. Orphans are found disproportionately in rural, female-, elderly-, and adolescent-headed households. Each of these is a risk factor for more extreme poverty. The over-representation in rural areas could reflect urban-rural migration around the time of death of the parent due to loss of income and the high cost of living in towns. Over-representation in female-, elderly-, and adolescent-headed households reflects the pre-disposition of men to seek employment in towns, estates and mines, the higher level of paternal orphanhood, the reluctance of second wives to take responsibility for their predecessors' children, and stress in the extended family system. The death of the mother was found to have a strong detrimental effect on a child's chances of completing primary school education – the strength of effect increasing with time since maternal death. Death of the father had no detrimental effect, despite the fact that paternal orphans were typically found in the poorest households.

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Introduction

IN SOUTHERN AFRICAN COUNTRIES, HIV is spreading extensively and is causing devastation in urban areas and - unlike in countries where the epidemic first took a hold – also in rural areas (UNAIDS 2002). Those who are getting infected and dying are in their most productive years of life (Sewankambo *et al.,* 1987; Timæus 1998) and are leaving behind a train of orphans and carers (Hunter 1990) who are thought to have little or no resources for their upkeep.

Over thirty-four million children aged 0-14 years at their last birthday are currently believed to be orphans[1] in Africa of whom almost one third (eleven million) have lost their parents due to AIDS (UNAIDS, UNICEF & USAID 2002). In Malawi, Zambia and South Africa, 9%, 12%, and 10% of children are reported to have lost one or both parents due to AIDS, respectively. In Zimbabwe, more than a quarter of adults aged 15-49 years are currently infected with HIV (UNAIDS 2002). Orphan levels have increased gradually but inexorably since the onset of the epidemic (Foster *et al*. 1995; Gregson, Zaba & Garnett 1999; Zimbabwe National AIDS Council, Zimbabwe Ministry of Health and Child Welfare, The MEASURE Project & CDC Zimbabwe 2002). The most recent available national-level data (Machirovi 2000) (Table 1) show substantially more children who have lost their fathers only (9.7%) than children whose mothers have died but whose fathers are still alive (2.7%) and children who have lost both parents (2.2%). A similar pattern is seen in both

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[1] One or both parents deceased.

urban and rural areas. However, rural areas show consistently higher percentages of paternal (10.9%) and double (2.4%) orphans as compared to urban settings (6.3% and 1.5%, respectively). The Demographic and Health Survey (DHS) results for Manicaland (where the current study was conducted) are similar to those for rural areas nationally, reflecting the predominantly rural nature of the province. Given that HIV prevalence is only just reaching its peak, all of these figures are expected to rise substantially over the next ten to fifteen years (Figure 1), as adults who are currently living with HIV succumb to AIDS (Preble 1990; Gregson, Garnett & Anderson 1994).

That orphaned children are amongst those most severely affected by HIV epidemics is beyond question. However, the precise implications for children's well-being and development of different forms of orphan experience by size and stage of HIV epidemic remain poorly understood. Early studies suggested that HIV epidemics were having relatively little impact on the socio-economic condition of orphans (Ryder *et al.* 1994) or on their access to education (Lloyd & Blanc 1996; Kamali *et al.* 1996). The absence of differentials between orphans and non-orphans was attributed to the nature and effectiveness of extended family care networks including the widespread practice of child fostering (Ankrah 1993; Foster *et al.* 1995; Lloyd & Blanc 1996; Urassa *et al.* 1996; Ntozi 1997). However, more recent data from Uganda and Zimbabwe, where HIV epidemics are more advanced and more severe, respectively, suggest erosion in extended family support arrangements (Seeley 1993; Foster *et al.* 1997) leading to lower school attendance (Konde-Lule 1997; Muller *et al.* 1999) and disrupted education (Sengendo & Nambi 1997) especially among orphaned children. This is especially unfortunate because, quite apart from the importance of the skills and qualifications obtained for a child's development and future career prospects, school attendance, characterised, as it is, by normality and routine, can be an effective antidote to the sense of insecurity and fretfulness often experienced in circumstances of parental loss (Kelly forthcoming).

In a recent review of data from fifteen African countries (Figure 2), it was concluded that orphans experience lower enrolment rates than non-orphans (Kelly 2000). However, the broad age-range considered (10-14 years) means that the comparison is distorted because orphaned children tend to be older (Hunter 1990) and are therefore more likely to have left school than non-orphaned children even when they have not experienced any discrimination or other disadvantage. This is a particular problem in countries where the cut-off age chosen for such comparisons is close to the age at which most children leave school. Variations in school leaving age probably therefore explain some of the apparent difference in the relative disadvantage of orphans seen between countries. A further weakness is that these and other results do not distinguish between different forms of orphan background and orphan experience. An orphaned child's care and educational opportunities will almost certainly depend upon key factors such as their gender, family and household background (including urban *versus* rural residence), and the wider cultural and socio-economic context. Equally, factors such as a child's age when a parent becomes sick or dies, the duration of the parent's illness, the order in which the father and mother die, and sickness and death amongst other care-givers seem likely to influence the care and educational opportunities that the child receives but have received little attention.

Most studies of the effects of orphanhood on education done to date have focussed primarily on access and enrolment rather than on the educational outcomes and achievements that ultimately affect a person's ability to succeed in the adult world. The studies also offer little information on the nature and effects of the temporal and spatial dynamics of childcare arrangements because, so far, most have been cross-sectional in nature.

The aims of this paper are to describe: (i) the levels and patterns of orphanhood in eastern Zimbabwe in the context of a large-scale maturing epidemic by location and level of HIV

prevalence; (ii) the household circumstances of children by survival status of parents; and (iii) the impact of different forms and periods of orphanhood on children's educational attainment (primary school completion) by sex and age.

Methodology

The data presented in this paper are drawn from a wider stratified population-based survey (the 'Manicaland Study') of the epidemiology and socio-demographic impact of HIV in eastern Zimbabwe (Gregson, Waddell & Chandiwana 2001; Gregson *et al.* 2002). The Medical Research Council of Zimbabwe approved the procedures followed in this survey (Ref.: 02187). The study areas consisted of twelve sites paired according to their socio-economic background (four large scale commercial estates, two roadside trading centres, two small towns and four subsistence farming areas). Trained enumerators identified and visited a total of 8,386 households in a preliminary household census in the study sites. After the project aims and objectives were explained, 8,233 (98%) of the households visited agreed to participate on the basis of informed consent. In total, 14,169 children aged less than 16 years (13,372 aged below 15 years) were identified in these households. For each of these children, information on the identities (using birth certificates), survival status and, where appropriate, years of death of their natural parents was recorded. In addition, information on the age and sex of the child, the household head's age, sex and relation to the child, the location and socio-economic status of the household, and the child's educational status was recorded. Child-and adolescent-headed households were taken to be those in which the head of household was aged less than 18 years and aged 18-24 years, respectively (Foster *et al.* 1997).

The SPSS-PC and STATA version 7 statistical packages were used for data entry, cleaning and analysis, respectively. Levels of paternal, maternal and double orphanhood were calculated and compared for each category of study area. Socio-demographic characteristics of and relationships to the heads of the household in which children were living (as a proxy for primary caregiver) were tabulated and contrasted by children's orphan status. Similar tabulations were prepared for factors previously shown to be good summary indicators of the socio-economic status of households within the region (Lewis 2000). Primary school entry (5-7 year-olds) and completion rates (13-15 year-olds) by sex and orphan status were calculated. The effects of paternal and maternal orphanhood on primary school entry and completion were estimated by calculating odds ratios (ORs) adjusted for single year of age using logistic regression analysis.

Results

Levels of orphanhood by place of residence and HIV prevalence

The data from the Manicaland Study indicate a recent rise in the proportion of children orphaned. This can be seen from Figure 3 which shows that more children have lost their parents in the last 5 years than would be expected if adult death rates had been constant. Paternal orphans are again much more common (9.4%) than either maternal (1.7%) or double orphans (1.4%) (Table 2). As expected (Hunter 1990; Gregson, Garnett & Anderson 1994), the average ages of paternal orphans (9.1 years), maternal orphans (9.9 years) and double orphans (10.0 years) are each higher than the average age of non-orphaned children (6.9 years).

The pattern of orphanhood was found to vary between socio-economic settings. The level of paternal orphanhood was highest in roadside trading centres (12.4%) and only intermediate in small towns (8.8%) despite the fact that male HIV prevalence was much lower in roadside trading centres (16%) than in small towns (27%). Maternal orphan rates were very similar in all sites despite the fact that female HIV prevalence was considerably higher in small towns (46%) than in roadside trading centres (25%) and subsistence farming areas (22%). The roadside trading centres, which had the second lowest female HIV prevalence, had the highest percentage of double orphans (2.3%), while the small towns, where female HIV prevalence was highest, had the lowest rate of double orphanhood (0.4%). In aggregate, the data show fewer children orphaned than the national and provincial figures from the DHS conducted at the same time. This is largely because urban and estate communities (where orphan levels are lowest) were deliberately over-represented in the stratified study design.

Relationship of household head to child by child's orphan status

Children with both parents alive typically live in households headed by 25-59 year-old men - in most cases, their fathers. One-third of these children's household heads had received secondary school education and more than three-quarters were currently in formal employment. In contrast, double orphans were equally likely to be living in households headed by women, many of whom were elderly grandparents or siblings. Double orphans were the most likely to be living in adolescent-headed households and in households with unemployed household heads but there were also quite a number who lived in households headed by more educated individuals in professional or skilled employment. Small but non-negligible proportions of double orphans were living with household heads to whom they were not related.

Fewer than half of the maternal orphans (41%) lived in their fathers' households. Many lived with grandmothers or aunts and maternal orphans were the most likely to be living in elderly-headed households (25%). Most paternal orphans lived with their mothers and this was the category most likely to be living in female-headed households (78%). The household heads of paternal orphans were the least likely to have received secondary education or be in professional or skilled employment probably because of historical sex differentials in school attendance.

Overall, orphans, regardless of type, were more likely than other children to be found living with household heads who had received no school education (combined OR, 1.56, *P<0.001*) and/or who were currently unemployed (OR, 1.66, *P<0.001*). However, we found very few living in child-headed households.

Socio-economic status of child's household by child's orphan status

There was some variation in the socio-economic status of the households in which orphaned and non-orphaned children lived (Table 4). Previous analyses have shown that the form of construction of the principal household dwelling and radio and bicycle ownership are good indicators of variation in socio-economic status among households in rural Manicaland (Lewis 2000). In the current study, orphans (in general) were more likely to be living in pole and dagga dwellings (OR, 1.37, *P=0.001*). Double orphans were the least likely to be living in brick structures with sheet rather than thatched roofs (*P=0.003*) but were also the most likely to be resident in households that owned bicycles (*P>0.05*). Paternal orphans were just as likely to live in houses of more modern construction as non-orphaned children but fewer of their households owned a radio (*P=0.001*) or a bicycle (*P<0.001*).

In part, these findings reflect the demographic differences between the heads of households in which children with different orphanhood backgrounds reside. For example, smaller proportions of the female and child/adolescent-headed households owned radios and bicycles than was the case in other households (*P<0.05*).

Primary school entry among children aged 5-7 years by parents' survival status

Table 5 shows the proportions of children currently aged 5-7 years who have commenced primary school education by sex and survival status of their parents. Very similar proportions of boys and girls have commenced school. Those whose parents have died recently are equally likely to have started school as children whose parents are still alive. On the other hand, children who lost one or both parents more than 4 years previously were actually more likely to have started school. This may be due, in part, to the small numbers of these young children who have parents who died more than 4 years in the past. However, children whose parents' died further into the past tend to be older and, other things being equal, an older child is more likely to have started school than a younger one. The results of the logistic regression analysis presented in Table 6 show that a boy or girl is approximately 5-times as likely to have started school by the time he or she reaches age 6 as they were when they reached age 5 and so on. Once this is taken into account by using logistic regression, orphaned children of any given age were just as likely to have started school as non-orphans of the same age (*P>0.05*). The logistic regression analysis results also confirm that there is no difference between the ages at which boys and girls start school (*P>0.05*).

Primary school completion rates in children aged 13-15 years by parents' survival status

Table 7 shows the proportions of children aged 13-15 years at last birthday who have completed primary school education by sex and survival status of their parents. Overall, as with school commencement, the recent death of a father or mother appears to make little difference to a child's chances of having completed primary school. Children whose fathers died further into the past appear more likely to have completed primary school whilst the opposite is true for children whose mothers died more than 4 years ago. Double orphans were found to have a similar chance of having completed school as other children. However, the number of double orphans aged 13-15 years identified in the study populations is relatively small (n=73).

Once logistic regression analysis is used to take into account differences in age between the boys and girls in the study and between children with different histories of orphanhood, girls were found to be significantly *more* likely to have completed primary school than boys (Table 8). It was found that the longer ago a child's mother had died, the slimmer were the chances that the child had completed school. However, children whose fathers had died further into the past were actually *more* likely to have completed primary school - even than those children of similar age whose fathers were still alive. This trend was statistically significant for girls but not for boys. Loss of both parents (double orphanhood) had no independent effect on a child's chances of having completed primary school so was excluded from the final logistic regression model.

Discussion

In this paper, we have presented data from a large-scale quantitative study of the impact of HIV on orphanhood in four socio-economic strata in eastern Zimbabwe. The results provide evidence for a

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recent increase in the overall prevalence of orphanhood in these areas. Children in each socio-economic stratum are more likely to have lost their father than to have lost their mother or both parents. Disproportionately high numbers of children in the most rural strata are paternal or double orphans - i.e.: in relation to the HIV prevalence levels found in the different socio-economic strata. By comparison to non-orphaned children, more paternal orphans live in female-headed households while more maternal and double orphans live in elderly- or adolescent-headed households. Orphaned children live in (statistically) significantly poorer households as indicated by the education and employment levels of their household heads, the structure of the main residential dwelling, and (for paternal orphans) ownership of household assets. However, the differences are relatively modest and a sizeable minority of double orphans lived in households of relatively high socio-economic status. Neither a child's sex nor his or her orphan status affects age at entry into primary school. Maternal death has an adverse effect on the chances of having completed primary school within the 13-15 year age-group. The greater the number of years it is since the mother died, the smaller the chance that a young man or woman will have completed school. However, paternal death is associated with an *increase* in the chance of having completed primary school by any given age. This was particularly so for girls for whom the greater the number of years since the father died, the greater the chance of having completed primary school.

The data presented here are drawn from a population-based household survey. Therefore, children living in institutions or on the street were not enumerated and the overall level of orphanhood recorded (12.5%) may have been under-estimated. Overall, relatively few children live in orphanages in Manicaland (Foster *et al.* 1995) and the study areas (as well as the province as a whole) are predominantly rural, so the discrepancy is probably small. Even so, under-enumeration of street children in the small towns could be one factor contributing to the relatively low levels of orphanhood found in these locations. Lower underlying mortality in urban areas due to higher local

standards of living and healthcare service provision probably also contributes. However, urban-rural migration during and following the parent's illness is almost certainly now the most important factor, especially for paternal orphans for whom the discrepancy between local levels of HIV prevalence and orphan prevalence is most pronounced. Likely reasons would include 'push' factors such as loss of employment and thus income by the parent and shortages of accommodation and the high cost of living in urban areas as well as 'pull' factors such as the availability of relatives in the rural areas to provide care and support and the desire to be buried in the rural 'home' close to the ancestral spirits. The latter can be a strong motive for moving even before death due to the high cost of hiring a hearse. More generally, orphan levels can be under-estimated in household surveys due to short-term mobility and confusion of the identities of foster and biological parents (Foster *et al.* 1995).

Despite these differences in the relative levels of paternal, maternal and double orphanhood between socio-economic strata, rates of paternal orphanhood are consistently highest. This fits the pattern seen so far in most sub-Saharan African populations (Gregson, Zaba & Garnett 1999; Bicego, Rutstein & Johnson 2002). In a parallel qualitative study in our research fieldwork areas, we found that some widows report children conceived subsequently through sexual relations with (still) surviving brothers of their deceased husbands as having lost their fathers. This practice has been described previously in Zimbabwe (Drew, Foster & Chitima, 1996) and also in a study in rural Tanzania (Urassa *et al.* 1996). Thus, overstatement of paternal orphanhood relative to maternal orphanhood in household surveys could explain a part of this apparent differential. However, more significant factors are likely to include the older average age of fathers, higher underlying (non-AIDS) male adult mortality, faster progression from HIV infection to death amongst men due to their typically older ages at infection (Darby *et al.* 1996) and, possibly, higher male than female infection rates during the initial phase of the HIV epidemic (Gregson & Garnett

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2000). There will almost certainly be substantial further rises in all forms of orphanhood over the next 10 years due to the cumulative effects of a sustained period of extremely high adult mortality (Gregson, Garnett & Anderson 1994) but the latter two factors would suggest that increases in maternal and double orphanhood will be disproportionately great.

The survey instrument did not include a direct question to establish the identity of the primary care-giver for each individual child enumerated. However, there was a question which established the relationship of each member of a household (including children) to the head of that household. We therefore investigated the family relationships between children and their heads of households and used data on the socio-demographic characteristics of the latter as indications of the likely nature and quality of care that children within any given household were likely to be receiving. Subject to the caveat mentioned above re: children living in orphanages or on the street, the data indicate that most children are still cared for within the extended family system and, at any given point in time, few are living in child-headed households. Only small numbers of mainly double and maternal orphans were not related to the head of household in which they were resident.

An issue of concern, particularly in relation to whether orphaned children experience stigma and discrimination within their extended families, is the question of whether they are found disproportionately within poorer households and, if so, whether this is principally because death rates are higher in poorer families and/or because orphaned children's closest surviving relatives tend to be poor or because better-off relatives are unwilling to care for them.

Our data suggest that orphaned children indeed do tend to be found disproportionately in poorer households. An exception to this was that quite a number of double orphans were found in seemingly better-off households. Double orphans appear to face a dichotomy of experience: some

are taken in hand by relatively well-off relatives (perhaps within generally more affluent families) whilst others fall through the extended family safety net (Foster 2000) and end up living in isolated elderly- or adolescent-headed households or, in a few cases, with non-relatives. Paternal orphans did not seem to be disadvantaged in the sense that they were equally likely to live in dwellings of more modern construction. However, their households often lacked assets associated with higher socio-economic status. One interpretation of this could be that these children typically remain with their mothers in the same households that they stayed in when their fathers were alive but that they lack household assets because of property grabbing (Gilborn *et al*. 2001) or because assets have been sold off to pay for the late father's healthcare and funeral costs or the children's own school fees. Fewer of the households of maternal orphans owned a bicycle but otherwise these households did not appear to differ from those of non-orphans.

The propensity for orphaned children to be living in poorer households in Manicaland and, indeed, in Zimbabwe as a whole (Bicego, Rutstein & Johnson 2002), is unlikely to result from higher HIV-associated mortality amongst poorer adults. The latter may develop AIDS more quickly because of poor nutrition and healthcare. However, greater proportions of people in the higher socio-economic classes were infected in the early stages of the HIV epidemic in Zimbabwe (Gregson, Waddell & Chandiwana 2001) and therefore mortality has so far been higher amongst the better-off - except, of course, to the extent that the additional healthcare costs faced by people with HIV will have acted as a drain on their resources. Thus, it seems likely that many orphans are slipping down the socio-economic scale from initially better-off to subsequently poorer households. The question remains as to the extent to which this is because the immediate family has suffered the loss of its principal breadwinner as opposed to stigma or discrimination within the family.

Most double and paternal orphans in Manicaland live with their closest surviving relatives who are generally female or elderly. Maternal orphans often face stigma in the sense that the father remarries and the new wife declines to care for his previous children. As a consequence, these children are frequently placed with other female or elderly relatives. The result is that all forms of orphans tend to live in poorer households largely because they reside in female- and elderly-headed households which are themselves typically poorer due to the lack of a breadwinner in formal employment. An important caveat to this is that we did not collect information on economic inputs to households from non-co-resident relatives. Elsewhere in sub-Saharan Africa, these external inputs are unusual (Urassa *et al.* 1996) but they could be significant in Zimbabwe where employment in the formal sector is more common. In an earlier study of child-headed households, we found evidence of supportive visits and material assistance from members of the extended family (Foster *et al.* 1997). Thus, indicators such as the employment status of the household head could give a false impression of the economic resources available to household residents.

The results on primary school completion are interesting. Sex differentials in school entry and drop-out appear to vary within sub-Saharan Africa. In Uganda, socio-cultural, economic, policy and political obstacles to the education of women were found to explain lower rates of female school enrolment (Atekyereza 2001). Families may give greater priority to boys' education while traditional customs pertaining to the social status of women may have become incorporated into the economic and political framework and thereby inadvertently interrupt their schooling. However, a faster male than female student drop-out rate at primary school level was found in a rural population in Tanzania (Urassa *et al.* 1997). In the current study, we recorded a higher primary school (grade 7) completion rate for girls than for boys in the age-group 13-15 years in a setting where the cost of primary school attendance is low (but now rising) and overall educational attainment is high by contemporary African standards. The reasons for this are not clear but could

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include greater motivation among girls to complete the curriculum before they are withdrawn from school and/or to do well in the hope of being allowed to continue to secondary school. Of course, higher or faster female primary school completion does not preclude the possibility that more boys will ultimately progress to and complete secondary school. At this point, other factors such as early pregnancy and marriage can lead to a higher female drop-out rate.

The contrasting educational experience of children who lose their fathers and mothers was unexpected. The loss of a mother is thought to have a detrimental effect on a child's education (Kelly forthcoming) because of the greater psychological distress (Makame, Ani & Grantham-McGregor 2002) it can cause. However, the death of the father actually appears to *enhance* a child's educational prospects. This is despite the fact that paternal orphans seem to live in relatively disadvantaged socio-economic conditions. Aid agencies have recently begun to pay school fees for orphans in some of our study areas which may be sustaining their school attendance rates (Kelly forthcoming). In addition, paternal orphans may be more likely to receive support from non-resident family members. This could be partly because widowed women are better placed to obtain assistance from relatives than widowed men. Being more dependent on financial assistance from their children as they grow old than widowed men, these women may also be more motivated to see them obtain educational qualifications. The statistical association between death of a father and primary school completion was particularly strong for girls. Thus, another factor could be that, when women become more closely involved in decisions on the education of their children, they give greater priority to the schooling of girls than do men. This finding is also consistent with the idea that girls could be more motivated to continue in school (Aspaas 1999).

Paternal orphans have been found to have higher school enrolment rates in at least one previous study - a national survey in Zambia conducted in 1998 (Zambia CSO 1998). In an analysis of

pooled data for Kenya, Tanzania and Zimbabwe, paternal orphans aged 11-14 years were found to be neither more nor less likely to fall behind at school – unlike maternal and double orphans - (Bicego, Rutstein & Johnson 2002). As in the current study, the large baseline category in these studies (children whose father and/or mother are still alive) includes children whose parents are terminally ill. If it is assumed that these children's education is adversely affected, their exclusion from the baseline group would be expected to yield somewhat more detrimental effects for both paternal and maternal loss.

Important incidental findings in relation to education were: (i) the importance of controlling fully for age of child when comparing the experiences of orphaned and non-orphaned children; and (ii) the strong linear relationship between length of time since parental death and a child's chances of completing school. Our analysis of primary school entry rates illustrated how simple comparisons of data for orphans and non-orphaned children that do not take account of the older average age of orphans within any chosen age-interval can give misleading results. i.e.: in this case, failure to control for age within the 3-year age-interval, 5-7 years, would have indicated that orphans typically start school earlier than other children which is not, in fact, the case. Official international agencies have used data which show that smaller proportions of orphaned than non-orphaned children in the age-range 10-14 years are still in school as the basis for statements that orphans suffer a disadvantage in education (e.g.: UNAIDS, UNICEF & USAID 2002). The latter may well be true (Bicego, Rutstein & Johnson 2002), but there is a danger that the extent of such disadvantage will be exaggerated and official estimates discredited.

The second finding highlights the important but generally overlooked point that the effects on children of losing one or both parents frequently accumulate over time. The severity of the effects of orphanhood will often be progressive. Even keeping in mind that a deceased parent could have

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been sick for some time and that this illness could have affected the child's well-being including his or her education, it makes sense, for example, that the longer it is since the mother died, the greater are the chances that the child will have dropped out of school. Thus, to isolate the nature of the impact of orphanhood, it can be useful to stratify data on different aspects of the well-being of children by the length of time since their parent(s) died.

The consistency of our results with findings from studies in other populations is variable. This must reflect differences in study methodology but also differences in local epidemiological (e.g.: size and age of HIV epidemic) and socio-economic context. An example of the latter might be that, if sickness-related urban-rural migration does contribute to the 'discrepancy' between HIV and orphan prevalence levels in urban and rural areas, such a discrepancy should be less apparent in countries with smaller formal sector economies and less developed urban-rural transport infrastructures. However, the implications could also be different. Following the same example, children in rural households in less developed countries could suffer more relative disadvantage than their counterparts in Zimbabwe due *inter alia* to their having fewer relatives employed in the formal sector and these relatives being less accessible. In either event, our results emphasise the crucial importance of development of rural economies and health and education services as strategies for cushioning the impact of HIV epidemics as well as being essential ends in themselves.

From the foregoing, it is clear that cross-sectional survey data provide useful but incomplete information on the processes through which orphans are found disproportionately in poorer households and on the factors that underlie observed differentials in primary school completion. Longitudinal and in-depth studies of family dynamics in the face of accumulating sickness and mortality are required to obtain a more complete understanding of these processes and their

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consequences. In this way, it may be possible to identify opportunities for interventions that support rather than undermine extended family and indigenous or church-based community care arrangements and that are therefore more likely to be sustainable as the effects of HIV epidemics grow and less likely to exacerbate the contemporary underlying tendency towards social dislocation (Foster *et al.* 1996).

Figures legends

Fig 1: Simulated trends in HIV prevalence and maternal orphanhood in a population subject to a major HIV epidemic (SOURCE: Gregson et al. 1994).

Fig 2: School enrolment among orphaned and non-orphaned children aged 10-14 year in 15 countries in sub-Saharan Africa (SOURCE: UNESCO 2000)

Fig 3: Distributions of paternal and maternal orphans by number of years since parental death, Manicaland, Zimbabwe, 1998-2000 and from a mathematical model simulation based on adult deaths rates for Zimbabwe in the mid-1980s

References

Ankrah, E.M. 1993. The impact of HIV/AIDS on the family and other significant relationships: the African clan revisited. *AIDS Care* **5**, **1**, 5-22.

Aspaas, H.R. 1999. AIDS and Orphans in Uganda: Geographical and Gender Interpretations of Household Resources. *The Social Science Journal* **36**, **2**, 201-226

Atekyereza, P.R. 2001. The education of girls and women in Uganda. *Journal of Social Development in Africa* **16**, **2**, 115-146.

Bicego, G., Rutstein, S. and Johnson, K. 2002. Dimensions of the emerging orphan crisis in sub-Saharan Africa. *Social Science and Medicine* (in press).

Darby, S.C., Ewart, D.W., Giangrande, P.L.F., Spooner, R.J.D. and Rizza, C.R. 1996. Importance of age at infection with HIV-1 for survival and development of AIDS in UK haemophilia population. *Lancet* **347**, 1573-1579.

Drew, R., Foster, G. and Chitima, J. 1996. Cultural practices associated with death in the north Nyanga District of Zimbabwe. *Journal of Social Development in Africa* **11**, 79-86.

Foster, G., Shakespeare, R., Chinemana, F., Jackson, H., Gregson, S., Marange, C. and Mashumba, S. 1995. Orphan prevalence and extended family care in a peri-urban community in Zimbabwe. *AIDS Care* **7**, **1**, 3-17.

Foster, G., Makufa, C., Drew, R., Kambeu, S. and Saurombe, K. 1996. Supporting children in need through a community-based orphan visiting programme. *AIDS Care* **8**, **4**, 389-403.

Foster, G. Makufa, C., Drew, R. and Kralovec, E. 1997. Factors leading to the establishment of child-headed households: the case of Zimbabwe. *Health Transition Review* **7**, Supplement 2, 155-168.

Foster, G. 2000. The capacity of the extended family safety net for orphans in Africa. *Psychology, Health and Medicine* **5**, **1**, 55-62.

Gilborn, L.Z., Nyonyintono, R., Kabumbuli, R. and Jagwe-Wadda, G. 2001. *Making a Difference for Children Affected by AIDS: Baseline Findings from Operations Research in Uganda*. Washington D.C., Horizons Program and Kampala, Makarere University.

Gregson, S. and Garnett G.P. 2000. Contrasting gender differentials in HIV-1 prevalence and associated mortality increase in eastern and southern Africa: artefact of data or natural course of epidemics? *AIDS* **14**, Supplement 3, S85-S99.

Gregson, S., Garnett G.P. and Anderson R.M. 1994. Assessing the potential impact of the HIV-1 epidemic on orphanhood and the demographic structure of populations in sub-Saharan Africa *Population Studies* **48**, 435-458.

Gregson, S., Waddell, H. and Chandiwana S.K. 2001. School education and HIV control in sub-Saharan Africa: from discord to harmony? *Journal of International Development* **13**, 467-485.

Gregson, S., Zaba, B. and Garnett G.P. 1999. Low fertility in women with HIV and the impact of the epidemic on orphanhood and early childhood mortality in sub-Saharan Africa. *AIDS* **13**, Supplement A, S249-S257.

Gregson, S., Nyamukapa, C., Garnett, G.P., Mason, P.R., Zhuwau, T., Careal, M., Chandiwana, S.K. and Anderson, R.M. 2002. Sexual mixing patterns and sex-differentials in teenage exposure to HIV infection in rural Zimbabwe. *Lancet* **359**, 1896-1903.

Hunter, S.S. 1990. Orphans as a window on the AIDS epidemic in sub-Saharan Africa: initial results and implications of a study in Uganda. *Social Science and Medicine* **31**, 681-690.

Kamali, A., Seeley, J.A., Nunn, A.J., Kengeya-Kayondo, J.F., Ruberantwari, A. and Mulder, D.W. 1996. The orphan problem: experience of a sub-Saharan Africa rural population in the AIDS epidemic. *AIDS Care* **8**, **5**, 509-515.

Kelly, M.J. 2000. *The Encounter between HIV/AIDS and Education*. Harare, UNESCO.

Kelly, M.J. Forthcoming. *The school response to the educational needs of orphans and children affected by HIV/AIDS.*

Konde-Lule, J.K. 1997. The impact of AIDS on families in Rakai District, Uganda. *XI International Conference on HIV and AIDS*, Vancouver, Canada.

Lewis, J.J.C. 2000. Orphanhood prevalence in rural Zimbabwe. Dissertation submitted for MSc in Applied Statistics, University of Oxford, Oxford.

Lloyd, C. and Blanc A. 1996. Children's schooling in sub-Saharan Africa: the role of fathers, mothers and others. *Population and Development Review* **22**, **2**, 265-298.

Machirovi, L.M. 2000. *Zimbabwe Demographic and Health Survey 1999*. Harare, Zimbabwe Central Statistical Office and Macro International.

Muller, O., Sen G. and Nsubuga A. 1999. HIV/AIDS, orphans and access to school education in Kampala, Uganda. *AIDS* **13**, **1**, 146-147.

Ntozi, J.P.M. 1997. Effects of AIDS on children: the problems of orphans in Uganda. *Health Transition Review* **7**, Supplement 1, 23-40.

Preble, E.A. 1990. Impact of HIV/AIDS on African children. *Social Science and Medicine* **31**, **6**, 671-680.

Ryder, R.W., Kamenga, M., Nkusu, M., Batter, V. and Heyward, W.L. 1994. AIDS orphans in Kinshasa, Zaire: incidence and socioeconomic consequences. *AIDS* **8**, **5**, 673-679.

Seeley, J. 1993. The extended family and support for people with AIDS in south-west Uganda: a safety net with holes? *AIDS Care* 5, 117-122.

Sengendo, J. and Nambi, J. The psychological effect of orphanhood: a study of orphans in Rakai district. *Health Transition Review* **7**, Supplement 1, 105-124.

Sewankambo, N.K., Carswell, J.W., Mugerwa, R.D., Lloyd, G., Kataaha, P., Downing, R.G. and Lucas, S. 1987. HIV infection through normal heterosexual contact in Uganda. *AIDS* **1**, **2**, 113-116.

Timæus, I. 1998. Impact of the HIV epidemic on mortality in sub-Saharan Africa: evidence from national surveys and censuses. *AIDS* **12**, Supplement, S15-S27.

UNAIDS, UNICEF & USAID. 2002. *Children on the Brink, 2002*. Washington D.C., TvT Associates

UNAIDS 2002. *Report on the Global HIV/AIDS Epidemic, 2002*. Geneva, UNAIDS and WHO.

Urassa M., Boerma, J.T., Ng'weshemi, J.Z.L., Isingo, R., Schapink, D. and Kumogola, Y. 1997. Orphanhood, child fostering and the AIDS epidemic in rural Tanzania. *Health Transition Review* **7**, Supplement 2, 141-154.

Zambia Central Statistical Office. 1998. *Living Conditions Monitoring Survey: Preliminary Report*. Lusaka, Zambia Central Statistical Office.

Zimbabwe National AIDS Council, Zimbabwe Ministry of Health & Child Welfare, The MEASURE Project and CDC Zimbabwe. 2002. *AIDS in Africa during the Nineties: A Review and Analysis of Survey and Research Results*. Chapel Hill, Carolina Population Center, University of North Carolina.
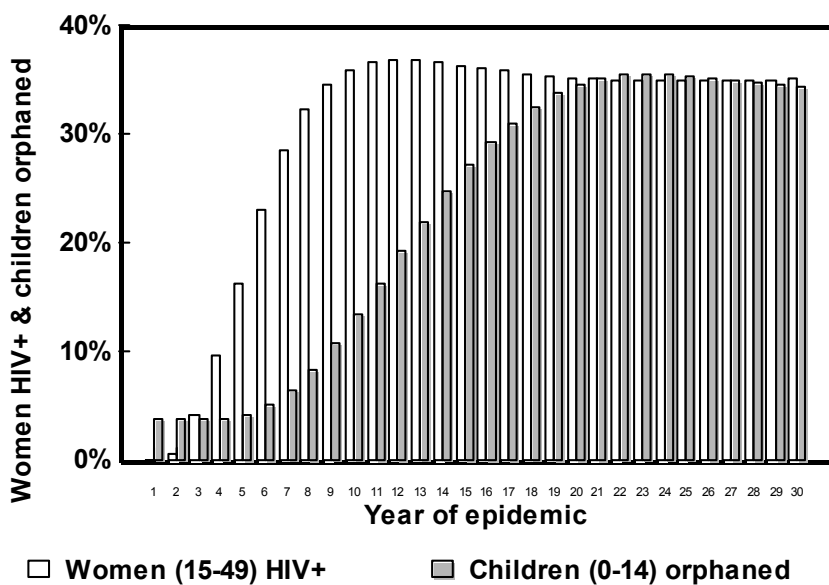
**Simulated trends in HIV prevalence & maternal orphanhood
in a population subject to a major HIV epidemic**
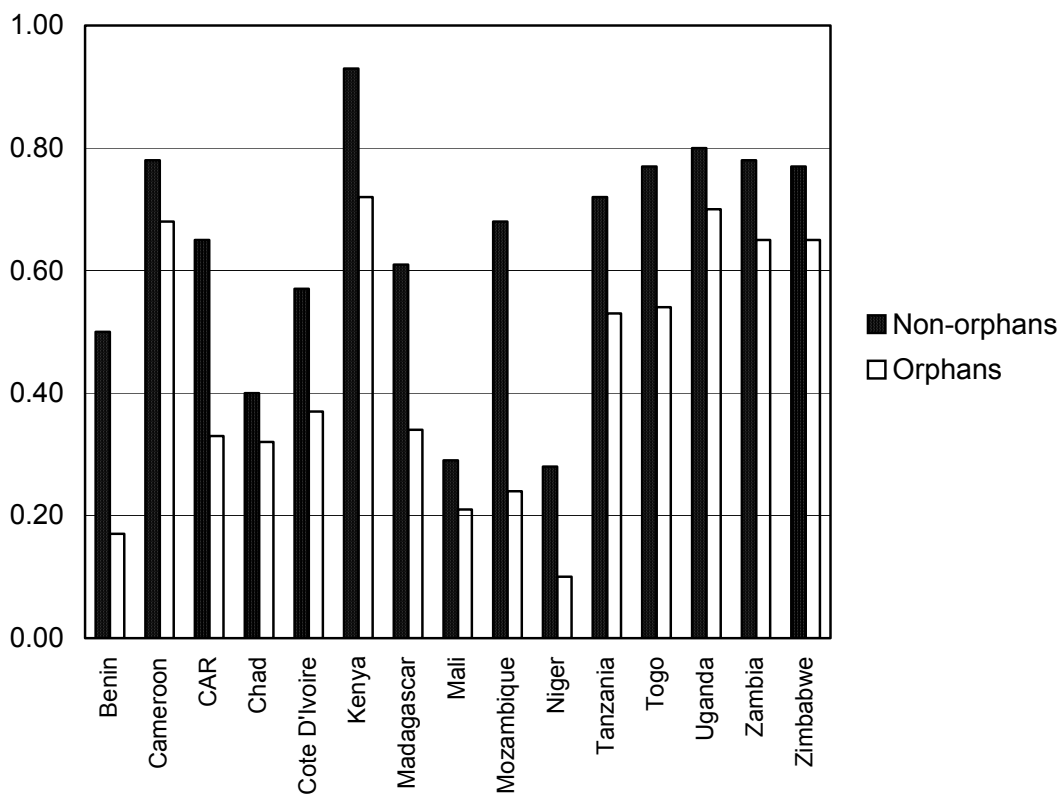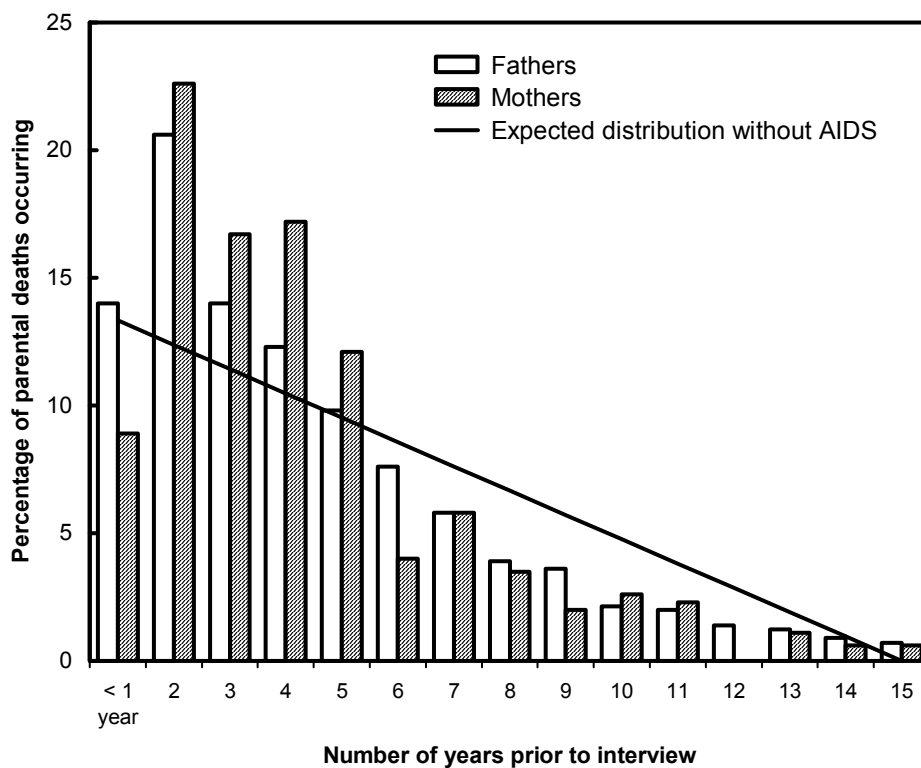
Table 1: Levels of paternal, maternal and double orphanhood among children under 15 years of age in Zimbabwe, 1999

Location	Father died only		Mother died only		Both parents died	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
National	1057	9.7	294	2.7	240	2.2
Urban	174	6.3	75	2.7	41	1.5
Rural	886	10.9	220	2.7	195	2.4
Manicaland	212	11.2	55	2.9	55	2.9

(SOURCE: ZIMBABWE DEMOGRAPHIC AND HEALTH SURVEY, 1999)

Table 2: Levels of paternal, maternal and double orphanhood among children under 15 years of age and HIV prevalence in adults aged 17-44 years by type of area in Manicaland, Zimbabwe, 1998-2000

Location	Father died only		Mother died only		Both parents died		Male HIV		Female HIV	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
All study areas	1263	9.4	229	1.7	190	1.4	738	19	1300	28
Small towns	143	8.8	29	1.8	7	0.4	198	27	325	46
Estates	287	7.6	63	1.7	44	1.2	288	18	345	28
Roadside settlements	333	12.4	41	1.5	62	2.3	86	16	235	25
Subsistence farming	500	9.4	96	1.8	77	1.4	166	15	395	22

Data on father or mother's survival status not known or missing for 2.8% (383/13755) of children.

Table 3: Relationship of children to head of household by child's orphan status

Characteristic of household head	Both parents died Frequency	Per cent	Father died only Frequency	Per cent	Mother died only Frequency	Per cent	Neither parent died Frequency	Per cent
Gender								
Male	95	50.0	263	20.8	142	62.0	8458	72.4
Female	92	48.4	989	78.3	87	38.0	3166	27.1
Data missing	3	1.6	11	0.9	0	0.0	66	0.6
Age group								
Under 18	1	0.5	4	0.3	0	0.0	19	0.2
18-24	34	17.9	44	3.5	21	9.2	492	4.2
25-59	103	54.2	982	77.8	143	62.4	9280	79.4
Over 60	45	23.7	192	15.2	56	24.5	1541	13.2
Data missing	7	3.7	41	3.2	9	3.9	358	3.1
Relationship to child								
Grandparent	76	40.0	278	22.0	74	32.3	1776	15.2
Parent	0	0.0	834	66.0	94	41.0	9292	79.5
Parent-in-law	0	0.0	6	0.5	0	0.0	21	0.2
Spouse	0	0.0	0	0.0	0	0.0	28	0.2
Sibling	35	18.4	36	2.9	13	5.7	79	0.7
Other relative	39	20.5	81	6.4	41	17.9	369	3.2
Adopted/foster parent	6	3.2	19	1.5	6	2.6	54	0.5
Not related	5	2.6	7	0.6	1	0.4	51	0.4
Data missing	29	15.3 *	2	0.2	0	0.0	20	0.2
Education level								
None	25	13.2	163	12.9	31	13.5	954	8.2
Primary	76	40.0	765	60.6	107	46.7	5814	49.7
Secondary or above	77	40.5	260	20.6	76	33.2	4171	35.7
Data missing	12	6.3	75	5.9	15	6.6	751	6.4
Employment level								
Professional or skilled	32	16.8	117	9.3	49	21.4	3005	25.7
Unskilled or manual	96	50.5	853	67.5	133	58.1	6727	57.5
Unemployed	58	30.5	283	22.4	47	20.5	1769	15.1
Data missing	4	2.1	10	0.8	0	0.0	189	1.6
	190		1263		229		11690	

* 29 double orphans were erroneously recorded as living with a biological parent.

Table 4: Socio-economic status of children's households by orphan status

Socio-economic indicator	Both parents died		Father died only		Mother died only		Neither parent died	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Radio ownership	105	55.3	593	47.0	129	56.3	6501	55.6
Bicycle ownership	37	19.5	191	15.1	35	15.3	2141	18.3
House type:								
Brick - sheet roof	107	56.3	844	66.8	160	69.9	7806	66.8
Brick - thatched roof	60	31.6	296	23.4	45	19.7	2889	24.7
Pole and dagga	19	10.0	115	9.1	23	10.0	870	7.4
Data missing	4	2.1	8	0.6	1	0.4	125	1.1
	190		1263		229		11690	

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Table 5: Primary school entry rates in children aged 5-7 years, by parents' survival status

Parents' survival status	Boys Frequency	Per cent	Girls Frequency	Per cent	Boys and girls Frequency	Per cent
Father's survival						
Alive at survey date	662	46.6	670	47.3	1332	47.0
Died - < 4yrs ago	35	41.2	46	50.0	81	45.8
Died - 4 yrs or more ago	23	54.8	30	56.6	53	55.8
Mother's survival						
Alive at survey date	702	46.4	729	47.6	1431	47.0
Died - < 4yrs ago	14	46.7	9	45.0	23	46.0
Died - 4 yrs or more ago	4	80.0	8	100.0	12	92.3
All children	720	46.5	746	47.8	1466	47.2

School entry defined as having completed at least one year of primary school education.

Children excluded if data on either parent's survival or year of death missing.

Table 6: Factors associated with primary school entry in children aged 5-7 years

Factor	Boys OR	p	Girls OR	p	Boys and girls OR	p
Time since father died (years)	0.91	0.191	0.99	0.909	0.96	0.367
Time since mother died (years)	1.01	0.939	1.39	0.241	1.14	0.388
Age	5.04	<0.001	5.21	<0.001	5.12	<0.001
Sex (female)	-		-		1.16	0.131
Number of children	1548		1560		3108	

OR: adjusted odds ratio calculated using logistic regression analysis to take account of confounding factors

Table 7: Primary school completion rates in children aged 13-15 years, by parents' survival status

Parents' survival status	Boys Frequency	Boys Per cent	Girls Frequency	Girls Per cent	Boys and girls Frequency	Boys and girls Per cent
Father's survival						
Alive at survey date	696	62.1	741	67.5	1444	65.1
Died - < 4yrs ago	45	51.1	69	73.4	114	62.6
Died - 4 yrs or more ago	57	65.5	96	79.3	153	73.6
Mother's survival						
Alive at survey date	760	62.2	853	69.6	1613	65.6
Died - < 4yrs ago	24	51.1	35	79.5	59	64.8
Died - 4 yrs or more ago	14	51.9	18	56.3	32	54.2
Both parents died (double orphans)	20	54.1	30	83.3	50	68.5
All children	798	61.6	906	69.1	1704	65.3

Children excluded if data on either parent's survival or year of death missing.

Table 8: Factors associated with primary school completion in children aged 13-15 years

Factor	Boys OR	Boys p	Girls OR	Girls p	Boys and girls OR	Boys and girls p
Time since father died (years)	1.04	0.212	1.09	0.011	1.07	0.007
Time since mother died (years)	0.87	0.015	0.89	0.039	0.88	0.001
Age	2.58	<0.001	3.32	<0.001	2.89	<0.001
Sex (female)	-		-		1.47	<0.001
Number of children	1296		1312		2608	

OR: adjusted odds ratio calculated using logistic regression analysis to take account of confounding factors
The parents of children whose fathers/mothers are alive at the interview date are treated as having died zero years ago