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# 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 of orphanhood (namely, double, paternal and maternal) 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 predisposition of men to seek*

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*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. The death of the father had no detrimental effect, despite the fact that paternal orphans were typically found in the poorest households.*

*KEYWORDS:*
education, extended family, orphans, poverty, Zimbabwe

**Introduction**

In southern African countries HIV is spreading extensively and is causing devastation in urban areas and—unlike the situation 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 34 million children aged 0–14 years at their last birthday are currently believed to be orphans[4] in Africa, of whom almost one third (11 million) have lost their parents due to AIDS (UNAIDS et al. 2002). In Malawi, Zambia and South Africa, 9 per cent, 12 per cent and 10 per cent of children respectively are reported to have lost one or both parents due to AIDS. 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, et al. 1999, Zimbabwe National AIDS Council et al. 2002).

The most recent available national-level data (Machirovi 2000) (Table I) show substantially more children who have lost their fathers only (9.7%) than children whose mothers have died but whose fathers are

[4] Namely, with one or both parents deceased

Table I: Levels of paternal, maternal and double orphanhood among children under 15 years of age in Zimbabwe, 1999

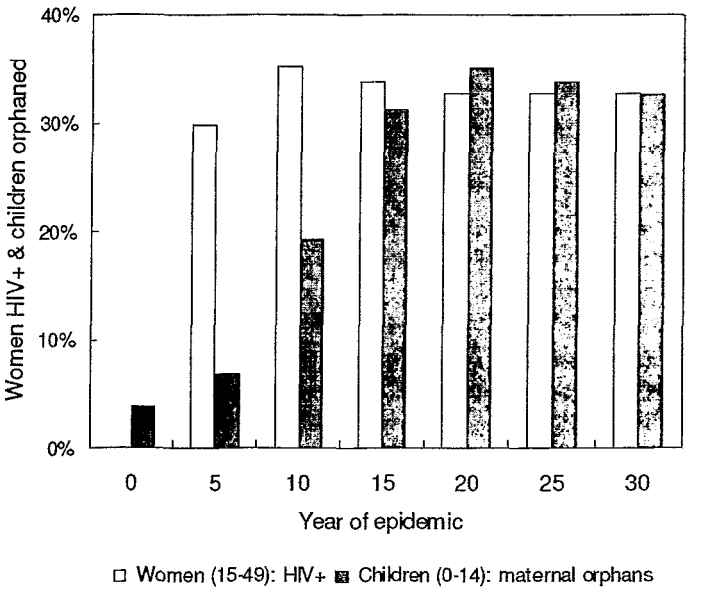
| Location | Father only died | | [illegible] | Both parents died | |
|---|---|---|---|---|---|
| | Freq. | % | Freq | Freq. | % |
| National | 1057 | 9.7 | [illegible] | 240 | 2.2 |
| Urban | 174 | 6.3 | [illegible] | 41 | 1.5 |
| Rural | 886 | 10.9 | [illegible] | 195 | 2.4 |
| Manicaland | 212 | 11.2 | [illegible] | 55 | 2.9 |

(SOURCE: ZIMBABWE DEMOGRAPHIC AND HEALTH SURVEY, 1999)

still alive (2.7%) and children who have lost both parents (2.2%). A similar pattern is seen in both 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 10 to 15 years (Fig. I), as adults who are currently living with HIV succumb to AIDS (Preble 1990, Gregson et al. 1994).

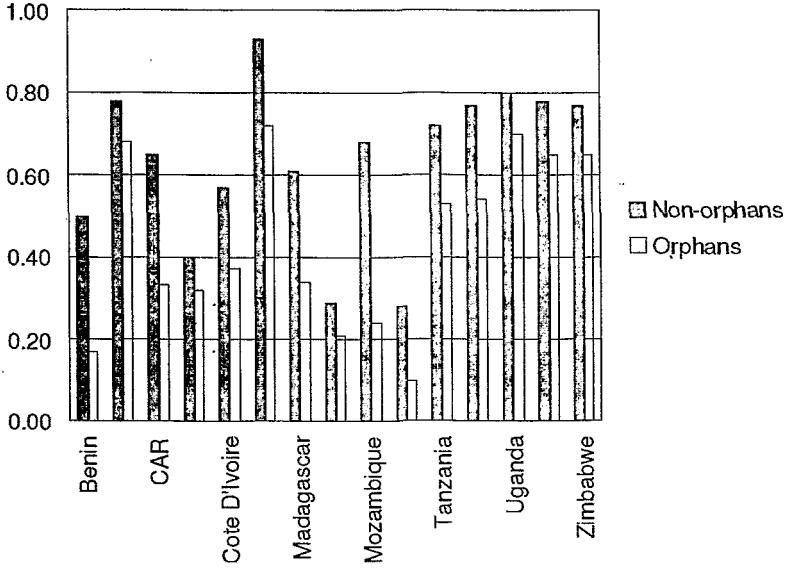
That orphaned children are amongst those most severely affected by HIV epidemics is beyond question. However, the precise implications for children's well-being and the development of different forms of orphan experience by size and stage of HIV epidemic remain poorly understood. Early studies suggested that HIV epidemics were having relatively little impact on the socioeconomic condition of orphans (Ryder et al. 1994) or on their access to education (Lloyd and 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 and Blanc 1996, Ntozi 1997, Urassa et al.

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




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 (Foster et al. 1997, Seeley 1993) leading to lower school attendance (Konde-Lule 1997, Muller et al. 1999) and disrupted education (Sengendo and Nambi 1997), especially among orphaned children. This is especially unfortunate because, quite apart from the importance of schools in allowing children to acquire the skills and qualifications for a child's development and future career prospects; school attendance, characterized, 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).

Fig II: School enrolment among orphaned and non-orphaned children aged 10–14 years in 15 countries in sub-Saharan Africa (Kelly 2000)




In a recent review of data from 15 African countries (Fig. II), 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 socioeconomic 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 caregivers seem likely to influence the care and educational opportunities that the child receives. These factors have received little attention.

Most studies of the effects of orphanhood on education done to date have focused 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 et al. 2001, 2002). The Medical Research Council of Zimbabwe approved the procedures followed in this survey (Ref. 02187). The study areas consisted of 12 sites paired according to their socioeconomic 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 8386 households in a preliminary household census in the study sites. After the project aims

and objectives were explained, 8233 (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 socioeconomic 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).

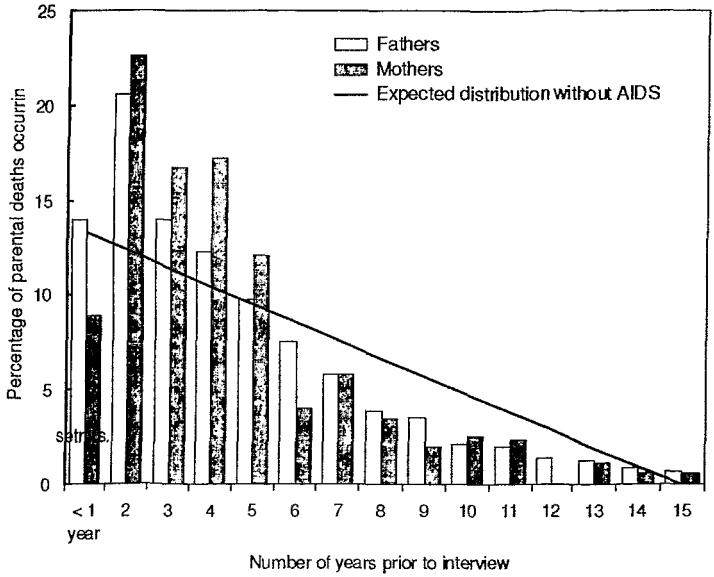
The SPSS-PC and STATA version 7 statistical packages were used for data entry and cleaning and for data analysis, respectively Levels of paternal, maternal and double orphanhood were calculated and compared for each category of study area. The socio-demographic characteristics of the heads of the household (as a proxy for primary caregiver) in which children were living and their relationships to the children were tabulated and contrasted by the children's orphan status. Similar tabulations were prepared for factors previously shown to be good summary indicators of the socioeconomic 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 Fig. III 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 II). As expected (Gregson et al. 1994,

Fig III: 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




Hunter 1990), 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 socioeconomic 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

**Table II: 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**

| | Father only died | | Mother only died | | Both parents died | | Male HIV | | Female HIV | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| All 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 sttls. | 333 | 12.4 | 41 | 1.5 | 62 | 2.3 | 86 | 16 | 235 | 25 |
| Subsist.farmg. | 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.

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*

Table III shows that 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,

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

| Characteristic of household head | Both parents died | | Father only died | | Mother only died | | Neither parent died | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| **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/fostered | 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/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 |
| N | 190 | | 1263 | | 229 | | 11690 | |

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

**Table IV: Socioeconomic status of children's households by orphan status**

| | Both parents died | | Father only died | | Mother only died | | Neither parent died | |
|---|---|---|---|---|---|---|---|---|
| **Socioeconomic indicator** | **Freq.** | **%** | **Freq.** | **%** | **Freq.** | **%** | **Freq.** | **%** |
| 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 |
| N | 190 | | 1263 | | 229 | | 11690 | |

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, regardless of type, orphans 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.

*Socioeconomic status of child's household by child's orphan status*

There was some variation in the socioeconomic status of the households in which orphaned and non-orphaned children lived (Table IV). Previous

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

| | Boys | | Girls | | Boys and girls | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| **Parents' survival status** | | | | | | |
| **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

analyses have shown that the form of construction of the principal household dwelling and radio and bicycle ownership are good indicators of variation in socioeconomic 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- or adolescent-headed households owned radios and bicycles than was the case in other households (*P<0.05*).

**Table VI: Factors associated with primary school entry in children aged 5–7 years**

| | Boys | | Girls | | Boys and girls | |
|---|---|---|---|---|---|---|
| **Factor** | OR | p | OR | p | 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

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

Table V 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 four 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 four 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 VI show that a boy or girl is approximately five times as likely to have started school by the time he or she reaches the age of 6 as they were when they reached the age of 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 ($P>0.05$).

**Table VII: Primary school completion rates in children aged 13–15 years, by parents' survival status**

| | Boys | | Girls | | Boys and girls | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| **Parents' survival status** | | | | | | |
| **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 - 4yrs 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 - 4yrs 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

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

Table VII 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 four 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

**Table VIII: Factors associated with primary school completion in children aged 13–15 years**

| | Boys | | Girls | | Boys and girls | |
|---|---|---|---|---|---|---|
| | OR | p | OR | p | OR | p |
| Factor | | | | | | |
| 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 TWO YEARS AGO

children with different histories of orphanhood, girls were found to be significantly *more* likely to have completed primary school than boys (Table VIII). 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 socioeconomic strata in eastern Zimbabwe. The results provide evidence for a recent increase in the overall prevalence of orphanhood in these areas. Children in each socioeconomic 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; that

is, in relation to the HIV prevalence levels found in the different socioeconomic strata. By comparison with 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 socioeconomic 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 is 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. Children living in institutions or on the street were therefore 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 socioeconomic strata, rates of paternal orphanhood are consistently highest. This fits the pattern seen so far in most sub Saharan African populations (Bicego et al. 2002, Gregson et al. 1999). 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 et al. 1996) and also in a study in rural Tanzania (Urassa et al. 1997). 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 and Garnett 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 et al. 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 caregiver 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 concerning 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, 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 do, indeed, 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 socioeconomic 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 dispossession (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 et al. 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 socioeconomic classes were infected in the early stages of the HIV epidemic in Zimbabwe (Gregson et al. 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 socioeconomic 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 that 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. 1997) 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 dropout appear to vary within sub Saharan Africa. In Uganda, sociocultural, economic, policy and political obstacles to the education of women were found to explain the 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, thereby inadvertently interrupting their schooling. However, a faster male than female student dropout 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 include greater motivation among girls to complete the curriculum before they are withdrawn from school, 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 dropout 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 et al. 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 socioeconomic conditions. Aid agencies have recently begun to pay school fees for orphans in some of our study areas: this 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 et al. 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. In this case, failure to control for age within the three-year age-interval, 5–7 years, would have misleadingly indicated that orphans typically start school earlier than other children. This is not, in fact, the case. Official international agencies have used data that 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 (UNAIDS et al. 2002). The latter may well be true (Bicego et al. 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 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 (such as the size and age of HIV epidemic) and socioeconomic contexts. 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, among other things, to their having fewer relatives employed in the formal sector or to these relatives being less accessible. In either event, our results emphasise the crucial importance of the 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 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. Such interventions 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).

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