The impact of HIV/AIDS and other macrosocial transformations on children's living arrangements in South Africa

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South Africa experienced profound social, political, and demographic changes in the 1990s. During this timeframe, not only did the country witness the historic end of apartheid, it also confronted the onset and rapid rise of HIV/AIDS. Although HIV/AIDS took hold later in South Africa than elsewhere in Sub-Saharan Africa, the country is now facing one of the most serious epidemics in the world (U.S. Census Bureau; UNAIDS). Indeed, adult HIV prevalence from antenatal surveys increased from 1 percent in 1990, to 7.6 percent in 1994 and 27.9 in 2003 (Department of Health, 2003). Based on a combination of vital registration data and estimates derived from AIDS modeling, Dorrington et al. (2001) attributed the significant increase in mortality at young and middle adult ages since the late 1980s to AIDS, and estimated that 40 percent of all adult deaths to people aged 15-49 in 2000 were from AIDS. Projections suggest that these trends in AIDS mortality will shift the age, dependency, and sex ratios of populations most affected by HIV (Gregson et al, 1994). The steep increase in mortality among adults in the most economically productive strata of society is already leading to in a rise in the incidence of orphanhood and widowhood, leaving many children without one or both parents. In particular, levels of orphanhood among black South African children age 0-14 rose significantly in the latter half of the 1990s. Between 1996 and 2001, maternal orphanhood increased from 1.3 percent to 2.2 percent; paternal orphanhood increased from 8.6 percent to almost 10 percent; and dual orphanhood increased from 0.86 percent to 1.25 percent. Merli and Palloni (2006) found these increases in maternal and double orphanhood to be responsive to rises in HIV prevalence across South African provinces. They attributed the weak responsiveness of paternal orphanhood to differential fosterage practices.

The period of rapid growth of HIV/AIDS in South Africa coincided with tremendous political and social changes following the collapse of the *apartheid* regime in the early 1990s. The Apartheid Group Areas Act and the labor migration system it supported kept rural families divided by encouraging male outmigration (Murray 1980, 1987; Russell 1995). These patterns of circular migration continued in post-*apartheid* South Africa (Posel, Fairburn and Lund 2004), with the added features of intensified rural-urban migration flows, broader age groups, and larger fractions of women (Posel and Casale 2002; Collinson et al. 2003; Posel 2003). In addition, growing unemployment throughout the decade, estimated at between 20 and 40 percent (Kingdon and Knight 2001), discouraged African families from settling permanently in urban areas and increased the circularity of migration and the fluidity of rural households. As a result of intense migration flows as well as the legacy of apartheid, families in rural South Africa are spatially divided units (Spiegel, Watson and Wilkinson 1996), relatives disperse to make a living (Russel 2003), and absent members who have migrated to urban areas often retain membership in their rural households, including as household heads (Budlender 2003).

This paper seeks to engage these important issues by investigating how household configurations and living arrangements have changed in the wake of HIV/AIDS and the

end of apartheid. In particular, we evaluate shifts in children's living arrangements between 1996 and 2001, a window of time when the epidemic began to take hold in South Africa through increases in mortality at young and mid-adult ages. A micro level analysis is well suited to investigating the impact of HIV/AIDS since the consequences of the disease are felt most immediately among individuals and households (Booysen 2003). We focus on the living arrangements of children because the environment in which children live and grow has important implications for their wellbeing and the future fabric of society. Further, by looking at trends in children's living arrangements we take an important first step towards understanding how households and communities are coping with the burden of HIV/AIDS. At the same time, an analysis of children's living arrangements during this time period will also shed light on the way that families and households have responded to the greater freedom of movement typified by the post-apartheid era and how the institution of the family is adapting to this extraordinary transition.

The extant literature provides evidence that households affected by HIV/AIDS have fewer adult members, higher dependency ratios, are more likely to be female-headed, and are more likely to dissolve than households that are not affected (i.e. Monasch and Boerma, 2004; Urassa et al., 2001; Hosegood et al., 2004). Although a greater number of orphans are residing in households that have experienced an adult death, households without adult mortality are also absorbing orphaned children (Desmond and Gow, 2002). Further, the risk of child migration is higher in the presence of adult mortality. For example, in the South African province of KwaZulu Natal, an area with particularly high HIV prevalence, the risk of child migration was twice as high in households with adult mortality as opposed to those without (Ford and Hosegood, 2005).

Research has shown that the loss of one or both parents and the ensuing adjustments that are required to cope with this shock negatively affects children's educational and health outcomes (i.e. Beegle et al., 2005; Case and Ardington, 2005; Ainsworth and Semali, 1998). The impact is especially acute for maternal orphans (Case and Ardington, 2005). For instance, Beegle et al. (2005) found that children in the Kagera region of Tanzania who were maternal orphans by the age of 15 were 2 centimeters shorter in adulthood than similar children whose mother did not die. Further, both maternal and paternal orphanhood resulted in substantially lower educational attainment by adulthood, especially if the child was not yet in school when the parent died. Case et al. (2004) suggest that the fact that orphans often live with distant relatives and unrelated caregivers may be a contributing factor in the lower school enrollment of orphaned children.

If death were the only reason for children to be cared for by non-parents, we would expect to find a higher proportion of orphans living without their parents as a consequence of the duration of the epidemic. But in South Africa children may "lose a parent" from migration or divorce as well as death (Bray, 2003; Ramphele, 2002). Conditions requiring the extended family to take in and support their grandchildren include: childbearing outside marriage (Kaufman et al., 2000; Garenne et al., 1999); remarriage and divorce, where daughters leave children from a previous union to live with the grandparents in the event of remarriage or a union with another man (Burman,

1996); and parents' absence due to labor migration (Smit, 2001; Russel, 2003). In addition to exacerbating the risk of HIV/AIDS (Lurie et al., 1997; Lurie et al., 2003; Nunn et al., 1995), increasingly high rates of population mobility impacts children's living arrangements in a manner similar to adult mortality. The above evidence suggests that an increase in prevalence of children living without one or both parents may not be due solely to HIV/AIDS, but could also be a result of high rates of population mobility, single motherhood, or divorce.

Data

In order to investigate the changes in children's living arrangements in South Africa and identify the source of these changes, we draw upon the first two censuses of post-apartheid South Africa conducted in 1996 and 2001. We use the 10 percent public samples of both censuses, which are based on a systematic sample of households stratified by district and province.

The use of census data to uncover patterns and changes in living arrangements of children has several advantages. First, they cover the whole country and will enable us to draw broader conclusions about trends in child living arrangements than is possible from smaller localized studies. Second, the large number of cases in our sample is uniquely suited to accommodate the performance of analyses and comparisons among population sub-groups without the loss of statistical power. Further, we will be able to build on previous research by documenting patterns and trends in children's living arrangements that have been identified in smaller longitudinal studies as placing children at greater risk for negative health and educational outcomes.

Objectives

1. We will formulate a simple framework to interpret aggregate changes in residential arrangements of children and to associate them with large-scale societal changes. We hypothesize the direction and mechanism through which each macrosocial change will affect living arrangements of children.

2. We will provide a description of changes in children's living arrangements and household organization during the 5-year interval between 1996 and 2001. We will focus on changes in the distribution of the type of household where children live by child's age, orphanhood status, province of residence, urban or rural residence, gender of the household head, absence of household members due to migration, household size, and the proportion of household members under 15.

3. We next explore the relationship between children's living arrangements and macrosocial transformations of the 1990s more precisely by predicting the effects of selected variables on children's living arrangements in 1996 and 2001. The hypothesized effects of HIV/AIDS and other macrosocial transformations on the living arrangements of children will determine the choice of variables.

Methods

Although there are a number of compelling typologies of household configurations in which children reside, we chose to define a set of classes or types that, in theory, should be uniquely sensitive to the phenomena under study. We distinguish the following household types where children ages 0-14 reside:

1. Incomplete nuclear households, consisting of a single parent and his/her children;
2. Nuclear households, consisting of parents and children;
3. Extended households, consisting of three generations;
4. Skipped-generation households, consisting of grandparents and grandchildren but no adult children, with or without any other family members;
5. Complex households, any of the above with one or more non-related person;
6. Other, residual category.

Some of the household types in this taxonomy are designed to capture changes associated with the impact of the HIV/AIDS epidemic and changes in migration flows. This is reflected in our use of "skipped-generation household" and "incomplete nuclear household," two categories that are seldom used in conventional classifications of household types.

To carry out the third objective listed above, for each year, we will estimate a multinomial logit model to uncover what factors are likely to explain living arrangements of individual children. The model takes the following form:

$$\lambda_i = \alpha + \beta_i * X_i$$

where $\lambda_i = \log(b(y_i)/p(y_j)$ is the log of the probability of residing in a particular type of household as opposed to another, and X_i and β_i refer to the explanatory variables and their coefficients. For example, we can show children's relative risk of residing in an unconventional type of household (e.g. incomplete nuclear or skipped generation household) as opposed to residing in a nuclear household as a function of selected characteristics, including: child's gender, age, orphanhood status, province of residence, rural or urban residence, and absence of members due to migration.

We estimate several nested models and assess the improvement in the fit statistics. Parameter estimates from the preferred models for 1996 and 2001 will be used to compute the predicted distribution of children's living arrangements by the most important predictors identified in each year, while holding all other individual level variables constant. Differences in patterns by year will be identified and interpreted in light of their consistency with the expected household adaptations to an increase in HIV/AIDS and other macrosocial transformations.

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