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ORIGINAL PAPER

The Impacts of the HIV/AIDS Pandemic and Socioeconomic Development on the Living Arrangements of Older Persons in Sub-Saharan Africa: A Country-Level Analysis

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Abstract This study investigates whether socioeconomic development and the HIV/AIDS pandemic are associated with living arrangement patterns in older persons in 23 sub-Saharan African countries. Country-level aggregate data were taken from previous household surveys and information provided by the United Nations, the World Bank, and the World Health Organization. Results showed that 13.5% of older persons (aged 60 years or over) were living with grandchildren but not adult children (i.e., skipped generation households). Countries higher in HIV/AIDS prevalence had more skipped generation households, and also more older persons living with spouse only and fewer older persons living with other relatives. Countries with higher socioeconomic development had fewer older persons living with children younger than 25 years old and more living with spouse only or with other relatives and unrelated persons. The pandemic and socioeconomic development combine to accelerate the breakdown of the extended family structure so that older persons are less and less likely to reside with, and to receive support from, their children.

Keywords AIDS · Socioeconomic development · Elderly · Orphans · Living arrangements · Africa · Demographic and health surveys · UNAIDS

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Introduction

Sub-Saharan Africa (SSA) is the least developed region globally (UN 2006).[1] Despite great strides in the recent decade, compared to the rest of the world, this region is not only poorest, but also disproportionately affected by armed conflicts, natural disasters, and communicable diseases, most notably AIDS. Yet, with a projected growth rate of 6% in 2009 (IMF 2008), and an annual urban growth rate of 3.79% for the 2000–2005 period (UN Population Division 2008), it is one of the most rapidly developing and urbanizing regions in the world. For instance, in 1960 when countries in the region began to gain independence from their colonial sovereignties, only 15% of the population in the entire region resided in urban areas. By 1990 when the AIDS epidemic began to accelerate in the region, 28% were living in cities and towns, which further rose to 35% in 2005. Educational opportunities, an important indicator of socioeconomic development, have also improved. "While progress has been slow towards achieving the Millennium Development Goals… no other region of the world has seen more [new enrolments] into schools as in Africa" (World Bank 2008, p. 2). Across the entire sub-Saharan region, 66% of primary-school-aged children were enrolled in school in 2004, up from 50% in 1991; the improvement was more obvious for girls, whose enrollments in 1991 and 2004 were 45 and 63% respectively (World Bank 2007). Whereas much attention has been paid to such developments as well as the

[1] Abbreviations are used for certain corporate authors in this article, as follows: HAI = HelpAge International; IMF = International Monetary Fund; PEPFAR = U.S. President's Emergency Plan for AIDS Relief; UN = United Nations; UNAIDS = Joint United Nations Programme on HIV/AIDS; UNICEF = United Nations Children's Fund; USAID = United States Agency for International Development; WHO = World Health Organization.

public health and economic implications of the AIDS pandemic, there has been relatively little discussion of the effects of such factors on the transformation of the family structure that is going on in this region. The study focused on the combined effects of socioeconomic development and the AIDS pandemic on one aspect of family changes in SSA—the living situation of older persons.

Socioeconomic Development and Older Persons

In developing countries around the world, taking care of older persons continues to be the primary responsibility of the family, whereas formal social protection/security (in the most generous case, this includes retirement benefit, maternal benefit, sick pay, disability allowances, health insurances) provided by the state is minimal, if any (e.g., see Hodges 2008). In Africa, aids to older persons also come from other informal support systems that may span over a broad geographical area, such as multi-generational kinship networks and mutual aid societies (see, e.g., Aboderin 2004b; Kaseke 2005). However, the situation is changing quickly as a result of socioeconomic development, so much so that Apt (1996) has called it a "crisis" in caring.

Unlike agrarian economies where production is tied to the land which is passed from one generation to another, the extended family is no longer the unit of economic production in industrial societies. Sociologists have long observed the breakdown of the extended family and the interdependence of family members, as well as the declining status of older persons and support from their adult children in the process of modernization and urbanization. Earlier theories (Burgess 1960; Cowgill 1986) focused on changing social norms of filial responsibility as a result of Westernization and the rise of individualism, as well as the lack of economic resources that an older person can provide to the next generation in exchange for support. More recent work (e.g., Aboderin 2004b; Hashimoto and Kendig 1992) has also emphasized the role of economic hardship in developing countries resulting in working adults directing resources to their children and spouse rather than to their aging parents (see review by Aboderin 2004a).

In developing countries, migration of younger workers from rural to urban areas to look for better economic opportunities is commonplace, resulting in a drain of the middle generation in rural areas. Once settled, these workers are likely to set up new nuclear households in the city. Although these young workers may send money back home, this may occur irregularly and in small amounts due to the cost of living in urban areas. For example, a qualitative study of multi-generational families in Ghana (Aboderin 2004b) found that, unlike the older generation who honored their parents unconditionally when they were younger, the middle and the young generations subscribed less to the traditional moral codes of filial piety. Support for parents was more guided by reciprocity and past parental conduct, and priority was given to the needs of spouse and children over that of parents. Preoccupation with socially constructed needs in modern ways of life (e.g., TV, mobile phone, spending time with friends) had aggravated the financial burden of the younger generations, which, along with their responsibility to the immediate family, made it practically difficult for midlife adults to offer filial support—a situation acknowledged even by the older persons themselves. Social norms have clearly changed, as the younger generations no longer expect to depend on their own children when they themselves become old.

Although there is plenty of anecdotal evidence concerning the breakdown of family support for older persons in Africa (e.g., Apt 1996), systematic and large-scale studies on the issue are rare. Lack of research funding and infrastructure, limited number of skilled local researchers, and bureaucratic red tape are among the major reasons quality data concerning Africa are lacking (Cohen and Menken 2006). A notable exception is the work of Bongaarts and Zimmer (2002) who analyzed data from the Demographic and Health Surveys (DHS) conducted in 43 developing countries around the world between 1990 and 1998. Twenty-three of these countries were in Africa and others were in Asia and Latin America. Sponsored by USAID, these were mainly nationally representative surveys (although certain rural areas in a country may be omitted occasionally due to inaccessibility). African countries had an average household size of 5.3 which was similar to those in Asia (5.2) and Latin America (4.8). However, men in Africa were more likely to live alone than their counterparts in Asia and Latin America. Co-residence with adult children was most likely in Asia and least likely in Africa. Using country as the unit of analysis, the authors examined whether living arrangements of older persons (aged 65+) were associated with indicators of socioeconomic development across countries. Controlling for region and gender of the older person, co-residence with adult children, whether married or not, was less likely when the country had more people with any schooling. Life expectancy, GNP per capita and percentage of population in urban areas did not have any significant effect beyond that of schooling percentage. The finding provided support to the notion that social development is associated with the breakdown of the extended family in the developing world.

At the transnational level, an analogy can be made with the findings of a cross-sectional study of remittances among international skilled and unskilled labor migrants (Faini 2007). The study found that migrants with higher

levels of education (skilled migrants) are less likely than their counterparts with lower levels of education (unskilled migrants) to send money home. Thus, to some extent, education and migration may indeed be contributory factors to the erosion of social capital among members of the same kinship networks.

HIV/AIDS and Older Persons

The *Chronic Poverty Report 2008–2009* (Chronic Poverty Research Center 2008) features a frail, 80-year-old Ugandan grandmother, Lozaj Nabitutilett, who carries a malnourished baby in her arms, with two other grandchildren standing by her side. The photo caption explains that Lozaj's five daughters all died of AIDS and that she is the sole caretaker of her six orphaned grandchildren. Lozaj's predicament captures a grim reality that is all too common in many AIDS-stricken communities throughout SSA: The prevailing HIV/AIDS pandemic has reversed the logic of intergenerational family care, and grandmothers have become the cornerstone of HIV/AIDS afflicted families (Lewis 2005).

By 2005, HIV had infected approximately 65 million people worldwide, almost 40% of whom had died since AIDS was discovered in 1981. SSA continues to bear the greatest impact of the pandemic, accounting for 67% of the 33 million people living HIV in the world in 2007, 70% of the 2.9 million new cases, and 75% of the 2 million AIDS deaths in 2007. Within this region, about half of the infections and death toll are in South Africa alone (UNAIDS 2008; UNAIDS and WHO 2006).

Women are more at risk than men, accounting for 59% of the infections, and younger women (aged 15–24) are three times as likely to be infected as their male counterparts. Many women pass the virus to their babies during pregnancy or through breast feeding; almost 2 million children aged 0–14 in SSA are living with HIV (UNAIDS 2006). The rate of infection in those aged 50 or over is less clear, but this group accounts for about 6% of AIDS cases in Africa (Knodel et al. 2003).

Although the prevalence rates and the magnitude of HIV/AIDS are still very high in several countries (e.g., South Africa has the highest number of persons infected with HIV: 5.7 million; and Swaziland the highest prevalence rate: 26%), there is some evidence that the pandemic has stabilized in the continent, and is steadily on the decrease among various groups in several countries including Botswana, Burkina Faso, Cote d'Ivoire, Mali, Malawi, Zambia and Zimbabwe (UNAIDS 2008). However, an increase in sexual risk-taking behaviors has also been reported in several countries including Burkina Faso where 90% of a sample of serodiscordant couples (couples with only one partner infected with HIV) reported that they did not use condom during their last sexual intercourse (de Walque 2007), and Uganda where the proportion of women and men who reported having sex with a person other than their spouse or partner has grown since 1995 from 12 to 16% for women and from 29 to 36% for men (see UNAIDS 2008). In Lesotho and Mozambique, prevalence rates among pregnant women, and incidence rates among young people (ages 15–24) continue to grow (UNAIDS 2008). Hence, despite the modest gains that have been made, the fight against HIV/AIDS is far from being under control.

There is no doubt that a pandemic of this scale has a major impact at the community level. In a survey conducted in villages in the Okavango Delta in Botswana, participants reported that while they had experienced horrendous shocks such as drought, parching of river channels, and damage to their crops by wildlife, none of these were comparable to the effects of HIV/AIDS on their lives (Kgathi et al. 2007). One of the most significant impacts of the pandemic, that is the focus of this study, is the breakdown of families. Because the household, clan or extended family constitute the basic social unit in African communities (Ayittey 2005; Harrison 2007), the breakdown of the family structure could represent the single most fundamental change to community relations in African societies.

Palloni and Lee (1992) predicted that the increase in widows and orphans would eventually disintegrate traditional kinship relations and family structure, and lead to the emergence of new social relations. Consequently, this region has witnessed the emergence of "skipped" generation households (i.e., households without the middle generation). Called "forgotten families," many households in SSA are now headed by older persons who care for their grandchildren left behind by deceased parents (International HIV/AIDS Alliance and HAI 2003).

Estimates suggested that SSA as a whole had 12 million living orphans due to AIDS (defined as children under the age of 18 who had lost one or both parents to AIDS).[2] in 2005, 79% of the world's total (UNAIDS 2006). This accounted for 28% of all the orphans in the region (UNAIDS et al. 2004). Furthermore, the number of orphans due to AIDS has increased 14-fold from 1990 to 2005 (UNAIDS 2006; UNAIDS et al. 2002). Nearly a quarter of the orphans due to AIDS in this region live in three

[2] For the definitions of orphans, we quote from UNICEF (2009), "UNICEF and numerous international organizations adopted the broader definition of orphan in the mid-1990s as the AIDS pandemic began leading to the death of millions of parents worldwide, leaving an ever increasing number of children growing up without one or more parents. So the terminology of a 'single orphan'—the loss of one parent—and a 'double orphan'—the loss of both parents—was born to convey this growing crisis." This definition is particularly relevant for the SSA situation because, as discussed later in the article, the surviving parent, particularly the father, often does not live with his or her children after the spouse died.

countries: Malawi, South Africa and Tanzania (UNAIDS 2008). Thus, the AIDS pandemic contributes to orphanhood, but is not the only factor. Other diseases (e.g., malaria, tuberculosis) and violent deaths in certain areas are also contributory factors.

Unlike other factors contributing to orphanhood, AIDS as a sexually transmitted disease tends to affect both parents. In 2003, 37.4% of the 12 million orphans due to AIDS were double orphans (both parents lost), but only 0.5% among orphans not due to AIDS (UNAIDS et al. 2004). One would therefore expect to find an increase in the number of child-headed households in the region. However, a recent study by Hosegood et al. (2007) found no evidence of any increase in child-headed households in the three countries with the greatest number of double orphans, namely Malawi, South Africa and Tanzania. This may suggest that most orphaned children are being absorbed into kinship and other community support networks.[3]

Due to the higher prevalence among women, who are infected at an earlier age than men, children are more likely to lose their mother than father to HIV/AIDS (UNAIDS 2004). Moreover, when one parent dies, children are more likely to live with their surviving mothers than with their surviving fathers, who tend to send their children to foster families. Orphans may be separated into different families (usually relatives) to share the burden of care, with approximately half of them (across SSA) being taken in by their grandparents. Orphanhood and orphans not living with the surviving parent are most common in Southern Africa. Orphans due to AIDS are stigmatized in their communities, less likely to attend school, more likely to suffer from underweight, more likely to engage in child labor and to be exploited sexually, not to mention the risk of catching HIV themselves. Children whose father died may also lose rights to inheritance (Guest 2001; Monash and Boerma 2004; UNICEF et al. 2006).

The burden to care for orphaned children has increasingly fallen on older persons. Households headed by older persons caring for orphaned grandchildren tend to live in extreme poverty. In 2004, 72% of the population in SSA lived on $2 or less a day, and 41% on $1 or less a day (World Bank 2007); many of these were older people and children affected by AIDS (HAI 2004; UNICEF et al. 2006). A survey of 40 countries in Africa suggests that households with orphans have an average of two orphans (Monash and Boerma 2004). In order to support the family, many older persons have to extend their work life, provide food, education and medicine, and run the daily errands needed to maintain a larger household. In fact, their burden began earlier when their adult children who became ill often "returned home to die" (when not living with them already) and may introduce opportunistic infections (e.g., tuberculosis) into the household. Because AIDS inflicts a person during his or her prime wage-earning years, older persons are particularly vulnerable financially and psychologically (not to mention the grief of losing their own children), with no one to take care of them while nursing young grandchildren themselves (see review by Knodel et al. 2003). This is particularly worrying due to the minimal social security systems available in these countries (except for a few) and the lack of social and health services in many areas, especially rural communities (Kaseke 2005).

A survey of 40 SSA countries during 1997–2002 (Monash and Boerma 2004) showed that 17% of the households with children were caring for orphans, and that heads of households with orphans tended to be older. Furthermore, among double orphans and single-parent orphans who did not live with either parent, 48% were living with their grandparents, and another 31% with other relatives. Variations within the region were quite noticeable: Over 60% in South Africa, Zimbabwe and Namibia, but about 25% in Cameroon and Mozambique, of this combined group (orphans without surviving or co-residing parent) lived with grandparents. Another survey of 24 SSA countries during 1994–2000 (Zimmer and Dayton 2005) showed that 59.2% of persons aged 60+ were living with adult children (half of which in 3-generation households), but only 8.5 and 8.9% were living alone and with spouse only, respectively. However, 16.5% of the older persons were living with grandchildren without their parents in the same household. This study also showed that the proportion of deaths due to AIDS in a country was strongly associated with the proportion of children being double orphans ($r = .83$) and the likelihood that an older person would be living with a double orphan ($r = .78$). Another study in Mpumalanga, South Africa showed that as many as 22.6% of older persons lived in skipped generation households (Makiwane et al. 2004).

The Study

The foregoing review reveals a converging trend: Older persons are less and less likely to live with their adult children, and to receive psychological and material support from them. Although there are studies that have examined the role of socioeconomic and AIDS-related variables on the living arrangements of older persons, the roles played by these two sets of variables have only been examined in isolation (Bongaarts and Zimmer 2002; Zimmer and

[3] Of note, recent reports from Cote d'Ivoire, Tanzania, and Zambia, indicate that school attendance rates were in fact higher among orphans than non-orphans. This may be credited in part to orphan-focused initiates from international agencies such as PEPFAR (UNAIDS 2008).

Dayton 2005). In ecological terms (Bronfenbrenner 1979), both socioeconomic development and the HIV/AIDS pandemic are the two powerful exosystem forces that impact on the family microsystem in this region of the world, and their simultaneous effects need to be investigated in greater depth.

The study examines the association of socioeconomic development and the HIV/AIDS pandemic with measures of living arrangements of older persons at the country level. In other words, the country is the unit of analysis, not individuals. We expected that the level of socioeconomic development of a country would be negatively associated with the degree to which older persons live with their children. We also expected that the prevalence of HIV/AIDS would be positively associated with the likelihood of living with grandchildren only (i.e., skipped generation households), and negatively associated with living with older adult children (due to AIDS-related mortality). Together, living with children is less likely in countries high on both factors.

It should be mentioned that SSA countries are highly heterogeneous in terms of socioeconomic development as well as the HIV/AIDS pandemic (see UNAIDS 2006; UN 2006). Such diversity across countries provides an excellent opportunity to study the degree to which country-level aggregate variables are associated with each other. This was the approach taken by Bongaarts and Zimmer (2002) and Zimmer and Dayton (2005) to study the relationship between socioeconomic/HIV data and living arrangements of older persons in developing countries, and will be adopted in this study with some methodological refinements. First, Bongaarts and Zimmer (2002) lumped all adult children together in one category and did not separate them into different age categories. No attention was paid to the possible effects of birth order on parental allocation of educational resources. In some communities, depending on the family size, resources, and location, older siblings may be more likely to receive education (see, e.g., Gomes 1984) and to migrate for employment reasons. In other contexts (e.g., South Africa where schooling is compulsory for all children aged 7–15), older siblings from financially distressed households, may likely drop out or sacrifice their schooling unwillingly in order to support their younger siblings (Watters 2008). It is therefore important to examine differential effects of the macro-level factors on the likelihood to live with older versus younger (adult) children.

Second, prior to 2001, orphan estimates were cumulative, meaning that the figures included also those who had died or survived into adulthood (UNAIDS et al. 2002) and were hence grossly inflated, as were the 1997 estimates from UNAIDS used in the Zimmer and Dayton (2005) study. Third, the co-residence of older persons with other relatives and unrelated persons was not examined in previous studies (Bongaarts and Zimmer 2002; Hosegood and Timæus 2005; Zimmer and Dayton 2005). In view of the importance of kinship and neighborhood networks in African communities (Cohen and Menken 2006), these living situations should be studied separately. In the following, we describe the measures used for addressing the research question and how the above methodological issues were handled in this study.

Measures

Socioeconomic development

The Human Development Index published annually by the UN ranks a country on the basis of achievements in health (life expectancy), education (adult literacy rate and school enrolment rate), and the economy (GDP). The theoretical linkage between life expectancy and living arrangements is less clear, and, in view of the small sample size in this study (see below), this variable was dropped. Rather, another variable, percentage of population living in urban areas as a measure of urbanization, was added. Adult literacy rate, which has a near perfect correlation with education enrollment ratio, was also dropped from the final measure of socioeconomic development in order to minimize bias by educational achievement which is represented by two variables in the UN index. The final set of variables included the net education enrollment ratio (primary, secondary and tertiary combined), proportion of population in urban areas, and GDP per capita (PPP) in constant 2000 international dollars. These data were obtained from the UN Statistics Division (2007) and the World Bank (2007) for the year the DHS was conducted in a specific country.

Because the sample size was small, attempts to reduce the number of variables for the purpose of analysis were made. The correlations among these three variables were high (average $r = .61$), suggesting that they tap a common construct. As a result, we formed an index of socioeconomic development by adding the standardized scores of the three variables.

HIV/AIDS pandemic

The retrieval of relevant HIV/AIDS data was more difficult and complicated. UNAIDS and WHO release these estimates every 2 years, and so estimates were not available for every year covered by DHS. Moreover, the estimates may be subject to revision at a later time under new assumptions about different risk factors and AIDS-related mortality, or additional data becoming available due to new surveillance systems established in individual countries (see UNAIDS 2006 for a discussion). For example, the 2001 data were revised in the 2003 update, and the 2003

data were revised in the 2005 update. To use data from different reports published at different times might introduce unknown bias into the analysis. The different definitions of "orphan" used over the years, as highlighted above, also introduced another difficulty.

We first analyzed WHO (2002) data for the year 2001 using the following variables: orphans due to AIDS as a proportion of the total population aged 0–14, HIV/AIDS prevalence rate, and mortality rate due to AIDS. We found that these three indicators were highly intercorrelated (average $r = .93$) among the African countries, suggesting that any one indicator can represent the other two in this sample. We chose to analyze the prevalence rate, which we believed would best represent the scale of the pandemic in different countries.

That different formulas were used to estimate HIV/AIDS prevalence rates as mentioned above presents another issue. There is an advantage of using estimates from the same year throughout in order to control for the margin of errors across countries. Furthermore, prevalence rates do not change drastically over a 2 year interval (see UNAIDS 2004, 2006). For these reasons, we obtained the 1999 prevalence estimates from UNAIDS (1999) which is the "mid-year" of the DHS period covered in this study (see below).

Living arrangements

Recently, the UN has compiled the living arrangements of persons aged 60 or over from different census and household surveys around the world (UN Population Division 2005). The report contains these data at the country-aggregate level for 28 SSA countries from DHS conducted between 1991 and 2001. For reasons mentioned above, we limit this study to the 23 countries in which the DHS was conducted between 1997 and 2001. Living arrangements (%) were divided into the following categories: (a) living alone, (b) living with spouse only, (c) living with children 25 years or older, (d) living with children under 25 years of age but not older children, (e) living with grandchildren but not children, (f) not living with children but with other relatives, and (g) living with unrelated persons.

Results

The data for the countries are presented in Table 1. As mentioned above, the countries were quite varied in terms of socioeconomic development, HIV/AIDS prevalence, and living arrangement, even within the same sub-region. On the whole, countries in Western and Middle Africa had lower HIV/AIDS prevalence rates than those in Eastern and Southern Africa, but the small number of countries in Middle and Southern Africa precluded further statistical analysis. Living with grandchildren without the middle generation was more common in Ethiopia, Ghana, Malawi, Rwanda, Zambia, Zimbabwe and South Africa. More women than men lived with grandchildren, and when they lived with adult children, women were more likely to live with older than with younger adult children. Across the 23 countries included, 9.2% of older men and 17.1% of older women (or 13.5% overall) lived with grandchildren whose parents were absent.

The main analysis was a series of ordinary least squares regressions of living arrangement on gender, socioeconomic development and HIV/AIDS prevalence. Each living arrangement variable was analyzed separately. Following Bongaarts and Zimmer (2002), data for men and women were included as separate entries in the dataset, hence 46 "cases" in total for each regression analysis. Tolerance statistics (>.90) showed that collinearity was low for all the analyses. The results are presented in Table 2.

Results showed that the set of predictors explained all the living arrangement variables, except for living alone, quite well, with R^2 ranging from .37 to .86. Neither socioeconomic nor HIV/AIDS factors contributed to the explanation of living alone. The strongest effect was due to gender, which was associated with virtually every living arrangement variable (except living with unrelated persons). Compared to men, women were more likely to be living alone, with older adult children, with grandchildren only, and with other relatives. They were, however, less likely to live with spouse only and with adult children below 25 years of age.

Moreover, countries that were more developed had more older persons who lived with spouse only, with other relatives, and with unrelated persons. In fact, it was the only variable that explained cross-country differences in living with unrelated persons in the same household. Moreover, older persons in these countries were less likely to live with children under the age of 25.

Controlling for gender and socioeconomic development, HIV/AIDS prevalence rates were associated with several living situations across countries. Older persons in countries with more HIV/AIDS cases were more likely to live with spouse only and to live with grandchildren but not adult children. They were also less likely to live with older adult children as well as other relatives, than those in countries with lower prevalence rates.

Discussion

This study examined, aside from gender differences, the effects of socioeconomic development and HIV/AIDS prevalence on the living arrangements of older persons in SSA, a region that is developing and modernizing rapidly,

Table 1 Country data

Country	Year	NEE (%)	Urban (%)	GDP	Persons aged 60 or over living with (%)							
					Alone	Spouse only	Child ≥ 25	Child < 25	Grand-child	Other relative	Unrelated person	HIV/AIDS rate[a]
Eastern Africa												
Ethiopia	2000	34	16	814	1.6	5.8	26.6	50.1	10.4	3.8	1.7	106
					8.6	3.3	40.7	14.1	21.8	8.8	2.8	
Kenya	1998	50	31	1,050	9.0	18.8	22.6	35.3	9.8	2.0	2.4	139
					25.2	10.9	28.6	13.2	17.9	3.8	0.6	
Madagascar	1997	39	28	809	4.3	10.7	32.0	34.0	13.6	3.1	2.2	1
					11.3	6.1	41.5	13.3	19.1	6.7	2.0	
Malawi	2000	72	15	583	8.4	15.7	17.4	34.9	18.3	4.4	0.9	160
					13.9	8.2	28.0	13.4	30.7	5.5	0.3	
Mozambique	1997	25	37	692	11.0	19.0	13.6	35.3	10.1	10.4	0.7	132
					18.1	9.0	40.1	12.0	12.8	7.9	0.2	
Rwanda	2000	52	6	931	4.4	8.4	19.1	50.2	14.6	2.3	1.1	112
					8.1	4.7	27.6	22.7	33.6	2.6	0.7	
Tanzania	1999	32	32	509	7.3	9.7	25.8	38.3	9.5	7.6	1.8	81
					7.9	4.8	48.1	8.2	15.5	15.0	0.4	
Zambia	2001	45	40	808	5.5	11.5	26.9	35.0	15.9	4.5	0.8	199
					12.3	8.1	37.5	7.2	27.0	6.4	1.6	
Zimbabwe	1999	65	35	2,738	8.1	11.7	24.8	36.6	12.3	5.0	1.5	251
					9.4	6.9	39.6	11.9	24.2	6.7	1.5	
Western Africa												
Benin	2001	49	43	991	9.0	6.2	31.1	44.5	4.6	3.8	0.8	24
					11.6	4.4	45.1	14.0	14.0	9.6	1.3	
Burkina Faso	1999	23	18	1,000	2.3	7.5	24.8	55.3	6.0	3.7	0.6	64
					2.4	6.6	47.2	23.3	7.8	11.1	1.5	
Côte d'Ivoire	1999	38	46	1,679	4.9	4.0	40.3	32.2	5.5	10.4	2.7	108
					2.8	2.5	48.3	7.4	9.1	25.9	4.1	
Ghana	1998	43	37	1,854	20.1	7.3	22.5	36.7	8.6	4.7	0.0	36
					22.7	3.1	31.7	10.4	25.6	6.2	0.4	
Guinea	1999	28	32	1,978	1.6	5.0	37.0	47.8	4.9	3.4	.3	15
					3.0	3.3	57.5	15.0	8.1	11.8	1.2	
Mali	2001	29	31	854	5.1	18.3	14.6	53.1	6.5	2.4	0.2	20
					9.8	18.4	34.3	17.3	12.2	7.5	0.6	

Table 1 continued

Country	Year	NEE (%)	Urban (%)	GDP	Persons aged 60 or over living with (%)							
					Alone	Spouse only	Child ≥ 25	Child < 25	Grand-child	Other relative	Unrelated person	HIV/AIDS rate[a]
Niger	1998	15	20	741	1.4	6.9	33.8	43.5	11.3	2.3	0.6	14
					5.9	3.5	50.2	12.7	17.1	9.3	1.2	
Nigeria	1999	45	43	830	3.3	9.5	28.9	48.2	6.8	2.5	0.8	51
					10.7	6.2	44.4	14.8	12.8	9.3	1.9	
Senegal	1997	35	45	1,347	1.6	1.8	54.6	30.4	2.7	7.9	1.1	18
					1.1	0.7	70.8	4.4	3.1	19.4	0.5	
Togo	1998	62	32	1429	6.9	6.7	35.1	37.8	6.7	6.3	0.6	60
					8.9	4.2	47.8	11.7	13.9	12.8	0.6	
Middle Africa												
Cameroon	1998	61	47	1,800	8.0	8.8	30.9	32.3	6.6	12.0	1.4	77
					8.6	4.7	46.4	8.4	9.8	20.6	1.6	
Chad	1997	29	23	833	5.0	12.1	17.2	54.6	6.4	4.5	0.3	27
					17.7	3.9	37.2	10.3	14.5	14.1	2.2	
Gabon	2000	83	81	6,175	12.3	17.5	23.8	16.9	8.5	15.7	5.4	42
					9.9	11.8	37.5	6.0	8.6	19.5	6.7	
Southern Africa												
South Africa	1998	95	50	8,633	8.0	18.0	37.6	15.0	12.7	6.8	2.0	199
					8.2	7.4	48.6	6.5	21.0	6.7	1.6	

Note: For living arrangements, data on the first row of each country refer to men, whereas those below refer t o women. NEE = net education enrolment, Urban = urban population, GDP = GDP per capital (PPP) in constant 2,000 international dollars, Child ≥ 25 = chilidren 25 years or older, Child < 25 = children under 25, Grandchild = grandchildren only but no adult child, HIV/AIDS rate = adult (aged 15–49) prevalence per 1,000

[a] 1999 data for all countries

Table 2 Regression of living arrangement of persons aged 60 or over on gender, socioeconomic development, and HIV/AIDS prevalence

	Alone	Spouse only	Child ≥ 25	Child < 25	Grand-child	Other relative	Unrelated person
Gender (female)	.35*	−.52**	.61**	−.86**	.52**	.46**	.05
Socioeconomic development	.12	.24*	.18	−.34**	−.19	.45**	.64**
HIV/AIDS prevalence	.12	.27*	−.26*	−.03	.51**	−.32*	−.18
R^2	.16	.43	.45	.86	.51	.43	.37

Note: Figures shown are standardized regression coefficients, unless otherwise specified

* $p < .05$, ** $p < .001$

and has had a long history of the HIV/AIDS pandemic. The different times and pace at which countries develop socially and economically, and the different times when the HIV/AIDS pandemic started and accelerated (or decelerated) across countries, provide an excellent context for studying the effects of macro social, economic and public health conditions on the changing family structure involving older persons.

Consistent with other studies (e.g., Hosegood and Timæus 2005; Zimmer and Dayton 2005), older women were more likely to be living alone than older men. Across the world, this trend was associated with the fact that women tend to outlive men and that they are less likely to marry again when widowed (UN Population Division 2005). Moreover, men tended to live with younger rather than older adult children. This may be explained by the fact that men tend to marry and have children at a later age (UN Statistics Division 2007), and so with age being constant, men were more likely to live with younger adult children. Furthermore, across the world, older women are more likely than older men to live with other relatives, reflecting the fact that women invest more in maintaining a kinship network and tend to depend on a broader scope of relationships for support (Cheng and Chan 2006; UN Population Division 2005).

Socioeconomic development was associated with fewer older people living with younger adult children in a country; as much as 86% of the variation in this living arrangement across countries was explained by socioeconomic development and gender in combination! No association was found between socioeconomic development and living with older adult children. This study therefore extends the previous literature (Bongaarts and Zimmer 2002) by showing that the effect of socioeconomic development on co-residence with adult children in developing countries is not the same depending on the age of the child. In developing countries in general, and in Africa in particular, it is common for young people with better occupational skills to migrate from villages to cities and towns where better wages are paid. The exposure to Western and urban lifestyle is often a catalyst for changing traditional concepts of filial responsibility (Aboderin 2004a, b), thus not only separating older parents and their children physically, but also culturally. Although some authors have underscored the financial benefits of remittances for poor households (e.g., Gupta et al. 2009), especially the ensuing gains made by children (Bock and Johnson 2002), like other regions of the world (UN Department of Economic and Social Affairs 2008), SSA countries have also witnessed a decline in traditional filial obligations. Owing to economic hardships in industrializing societies and the consequent concentration of resources on the younger rather than the older generation, the overall impact of remittances on the welfare of older persons has been questioned (see reviews by Aboderin 2004a; Hashimoto and Kendig 1992). In fact, in Cameroon, it has been found that remittance from migratory workers fail to serve as a social security for older persons in the household of origin unless a sizable inheritance is expected—the amount of remittance is positively correlated with the value of the older parents' possessions (land, livestock, etc.)– so that the poor get poorer (Schrieder and Knerr 2000). Thus the lack of emotional and instrumental support from migrated children is not necessarily compensated by material gains.

Aside from its effect on living with younger adult children, socioeconomic development was also associated with living with other relatives and unrelated persons. One can see from Table 1 that living with other relatives was most common in Gabon and Cameroon. In these countries, which were well above the median in the region's development index, about 20% of the women lived with other relatives. There appeared to be a gender by development interaction but the small sample size precluded a formal test of this hypothesis. In an era of rapid economic and social changes, living with relatives and friends when adult children are not available represents a strategy to pool together resources for mutual material and social support, particularly in poor communities. It suggests the way African communities are changing in the face of modernization and urbanization. In communities with little state welfare provision and a strong tradition of kinship and neighborhood support, this form of household does not carry the stigma as it would in Western or Asian societies and can therefore be rather adaptive.

By contrast, countries with higher HIV/AIDS prevalence tended to have more older persons living with grandchildren only, but fewer older persons living with children 25 years or older. This is consistent with the common observation that, in these communities, adult mortality, along with other factors (most notably, mobility; see Zimmer and Dayton 2005), leads to the emergence of skipped generation households. As revealed in this and other studies (Merli and Palloni 2006; Zimmer and Dayton 2005), around 14% of older persons live with grandchildren but not adult children in the sub-Saharan region. Women are more likely than men to live in skipped generation households, suggesting that many more widows than widowers are caring for their orphaned grandchildren alone. The burden placed on these older women, particularly in view of the fact that women are more financially vulnerable than men (HAI 2004), is tremendous.

Because AIDS mortality was concentrated in those aged 25–49 (especially those in their 30s or 40s) during the period of the present surveys (Bicego 1997),[4] living with children under 25 years old was not associated with the HIV/AIDS pandemic. In this region, multigenerational families are still the norm (Hosegood and Timæus 2005; Zimmer and Dayton 2005), despite the joint effects of AIDS mortality and socioeconomic development. Because of the higher fertility rates in the older days, families with migrated or deceased adults might still have other young/midlife adults in the household. Hosegood and Timæus' (2005) 2 year longitudinal study in rural South Africa suggested that other young, family members often move in to help out when a family member passes away, so that a skipped generation household may be converted to a multigenerational household at a later time. Alternatively, movements between households also happen, such as young children being sent to live with other relatives. Nevertheless, it is important to note that households with the middle generation missing have become a rather common family structure in SSA, certainly more common than other more conventional forms of household, such as living with spouse only (Table 1). Moreover, such living arrangements tax the resources of those in the family, whether living together or apart, particularly the grandparents. The number of skipped generation households is expected to increase further as the impact of the AIDS pandemic is more fully felt in some countries (see UNAIDS 2006).

The degree to which HIV/AIDS was prevalent in a country was also associated with fewer older persons living with other relatives. This could be due to the necessity to take care of orphaned grandchildren, especially when one was widowed. In Africa, it is common for widows to move into other relatives' households, especially those on the matrilineal side. The need to care for young grandchildren would make it difficult to move in with other relatives. In fact, oftentimes, relatives play the role of foster parents and share the burden of care in separate households. Alternatively, these older persons might be stigmatized due to AIDS in the family and are avoided by others. The reasons are likely to be complex and not well understood. In terms of the combined effect of HIV/AIDS pandemic and socioeconomic development, they appeared to cancel each other's effect out in whether older persons and extended kin tended to live together in the same household in these SSA communities.

Limitations

First, the data were aggregated to the country level and could not reveal the processes by which families cope with HIV/AIDS threat and socioeconomic changes. Second, due to the small number of countries involved, certain ideas could not be tested, such as interaction effects among the variables. Other than possible interactions with gender, it is possible that the HIV/AIDS pandemic interacts with socioeconomic development to hasten the dissolution of traditional family structures. Alternatively, it is plausible that socioeconomic development is associated with better health outcomes (e.g., through preventive interventions and increased access to antiretroviral treatment), thus restoring the autonomy of the ailing adult child as a support provider for older persons in the long run. Third, also due to small sample size, the effect of orphans due to causes other than AIDS was not examined, as it would have an effect on family structure as well. Fourth, the cross-sectional nature of the dataset does not allow examination of other interesting hypotheses. For example, how do changes in HIV/AIDS prevalence relate to changes in the living arrangements of older persons? Does socioeconomic development predict household size over time? Such questions cannot be answered without longitudinal data on living arrangements.

Finally, although the measure of socioeconomic development includes urbanization, the effect of which on living arrangements has been studied, separate data on living arrangements in urban and rural areas might reveal more information as urban and rural living arrangements may differ. For instance, skipped generation households may be more common in rural than in urban areas (Zimmer and Dayton 2005), where the conditions are more deprived. Given the limited infrastructures often available in rural communities, and the scant opportunities for employment beyond farming, the financial costs associated with transporting AIDS patients to health services, medical fees, and

[4] The mortality age due to AIDS-related diseases is decreasing. Those aged 20–29 and 30–39 now have the highest mortality rate in sub-Saharan Africa (UNAIDS 2006).

funeral expenses in case of death are an even greater burden for villagers. Indeed, this difficulty of access to care and opportunity may partially explain the rural exodus and increased urbanization in SSA. Hence future studies should take a closer look at the effects of these factors on rural versus urban communities.

Despite these limitations, this is, to the best of our knowledge, the first study that investigates the simultaneous effects of socioeconomic development and the HIV/AIDS pandemic on the living arrangements of older persons across countries. The findings reveal many patterns in living arrangements that vary systematically with the level of socioeconomic development and HIV/AIDS prevalence across countries in the sub-Saharan region. The converging pattern is decreasing children's support for older persons while increasing burden on them to take care of younger family members. Together, these two forces lead to more older persons living with spouse only, with grandchildren in the absence of parents, or with unrelated persons, but fewer living with adult children, whether younger or older. On a continent where traditional knowledge and wisdom are still transmitted from one generation to another through oral history, and where the passing of an older person has been equated to the burning of a library, it is of great concern that many grandparents in HIV-afflicted families have been abandoned to their fate. Regardless of whether a grandparent is heading a HIV-affected household or not, it should shame and diminish us all to neglect some of the most caring and vulnerable members of our societies. Interventions to support these people are urgently needed. An initial step may be to devise and enforce policies that combine target cash support with legal services and psychological counseling to grandparents heading HIV-affected households in both rural and urban communities. UNICEF (2007) estimated that up to 80% of HIV-afflicted families in poor countries (including those headed by older persons) can be effectively assisted through well-designed social cash programs. As a more long-term strategy, countries will need to consider the consequences to the communities when today's grandparents pass away themselves. As Chazan (2008) has recently cautioned, we may need to brace for more devastating changes to African families in the years to come.

References

Aboderin, I. (2004a). Modernisation and ageing theory revisited: Current explanations of recent developing world and historical Western shifts in material family support for older people. *Ageing & Society, 24*, 29–50.

Aboderin, I. (2004b). Decline in material family support for older people in urban Ghana, Africa: Understanding processes and causes of change. *Journal of Gerontology: Social Sciences, 59B*, S128–S137.

Apt, N. A. (1996). *Coping with old age in a changing Africa*. Aldershot, UK: Avebury.

Ayittey, B. N. G. (2005). *Betrayal: Why socialism failed in Africa?* New York: Foundation for Economic Education. Retrieved online on December 15, 2007 at: http://www.fee.org/publications/notes/notes/Betrayal.asp.

Bicego, G. (1997). Estimating adult mortality rates in the context of the AIDS epidemic in sub-Saharan Africa: Analysis of DHS sibling histories. *Health Transition Review, 7*(Suppl 2), 7–22.

Bock, J., & Johnson, S. E. (2002). Male migration, remittances, and child outcome among the Okavango Delta Peoples of Botswana. In C. S. Tamis-LeMonda & N. Cabrera (Eds.), *Handbook of father involvement: Multidisciplinary perspectives* (pp. 308–335). Mahwah, NJ: Lawrence Erlbaum Associates.

Bongaarts, J., & Zimmer, Z. (2002). Living arrangements of older adults in the developing world: An analysis of demographic and health survey household surveys. *Journal of Gerontology: Social Sciences, 57B*, S145–S157.

Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.

Burgess, E. W. (Ed.). (1960). *Ageing in Western societies*. Chicago: University of Chicago Press.

Chazan, M. (2008). Seven 'deadly' assumptions: Unravelling the implications of HIV/AIDS among grandmothers in South Africa and beyond. *Ageing & Society, 28*, 935–938.

Cheng, S.-T., & Chan, A. C. M. (2006). Relationship with others and life satisfaction in later life: Do gender and widowhood make a difference? *Journal of Gerontology: Psychological Sciences, 61B*, P46–P53.

Chronic Poverty Research Center. (2008). *The chronic poverty report 2008–09: Escaping poverty traps*. Manchester, UK: Author.

Cowgill, D. O. (1986). *Aging around the world*. Belmont, CA: Wadsworth.

Cohen, B., & Menken, J. (Eds.). (2006). *Aging in sub-Saharan Africa: Recommendations for furthering research*. Washington, DC: National Academic Press.

de Walque, D. (2007). Sero-discordant couples in five African countries: Implications for prevention strategies. *Population and Development Review, 33*, 501–523.

Faini, R. (2007). Remittances and the brain drain: Do skilled migrants remit more? *The World Bank Economic Review, 21*(2), 177–191.

Gomes, M. (1984). Family size and educational attainment in Ghana. *Population and Development Review, 10*(4), 647–660.

Guest, E. (2001). *Children of AIDS: Africa's orphan crisis*. Pietermaritzburg, South Africa: University of Natal Press.

Gupta, S., Pattillo, C., & Wagh, S. (2009). Impact of remittances on poverty and financial development in sub-Saharan Africa. *World Development, 37*, 104–115.

Harrison, D. A. (2007). African households: Censuses and surveys (A general demography of Africa) (review). *Social Forces, 85*(4), 1812–1813.

Hashimoto, A., & Kendig, H. L. (1992). Aging in international perspective. In H. L. Kendig, L. C. Coppard, & A. Hashimoto (Eds.), *Family support to the elderly: The international experience* (pp. 3–13). Oxford: Oxford University Press.

HelpAge International. (2004). *Age and security*. London: Author.

Hodges, A. (2008). *Perspective for social protection of West and Central Africa.* London, UK: Child Rights Information Network (CRIN). Electronic document retrieved on December 15, 2008 at: http://www.crin.org/docs/Perspectives%20for%20Social%20Protection%20in%20West%20and%20Central%20Africa.doc.

Hosegood, V., Floyd, S., Marston, M., Hill, C., McGrath, N., Isingo, R., et al. (2007). The effects of high HIV prevalence on

orphanhood and living arrangements of children in Malawi, Tanzania, and South Africa. *Population Studies, 61*, 327–336.
Hosegood, V., & Timæus, I. M. (2005). The impact of adult mortality on the living arrangements of older people in rural South Africa. *Ageing & Society, 25*, 431–444.
IMF. (2008). *Regional economic outlook: Sub-Saharan Africa*. Washington, DC: Author.
International HIV/AIDS Alliance and HelpAge International. (2003). *Forgotten families: Older people as carers of orphans and vulnerable children*. Brighton, UK: Author.
Kaseke, E. (2005). Social security and older people: An African perspective. *International Social Work, 48*, 89–98.
Kgathi, D. L., Ngwenya, B. N., & Wilk, J. (2007). Shocks and rural livelihood in the Okavango Delta, Botswana. *Development Southern Africa, 24*, 289–308.
Knodel, J., Watkins, S., & VanLandingham, M. (2003). AIDS and older persons: An international perspective. *Journal of Acquired Immune Deficiency Syndrome and Human Retrovirology, 33*, S153–S165.
Lewis, S. (2005). *Race against time*. Toronto, ON: Anansi.
Makiwane, M., Schneider, M., & Gopane, M. (2004). *Experiences and needs of older persons in Mpumalanga*. Mpumalanga, South Africa: Report to Human Science Research Council and Department of Health and Social Services.
Merli, M. G., & Palloni, A. (2006). The HIV/AIDS epidemic, kin relations, living arrangements, and the African elderly in South Africa. In B. Cohen & J. Menken (Eds.), *Aging in sub-Saharan Africa: Recommendations for furthering research* (pp. 117–165). Washington, DC: National Academic Press.
Monash, R., & Boerma, J. T. (2004). Orphanhood and childcare patterns in sub-Saharan Africa: An analysis of national surveys from 40 countries. *AIDS, 18*(Suppl 2), S55–S65.
Palloni, A., & Lee, Y. J. (1992). Some aspects of the social context of HIV and its effects on women, children, and families. *Population Bulletin of the United Nations, 33*, 64–87.
Schrieder, G., & Knerr, B. (2000). Labour migration as a social security mechanism for smallholder households in sub-Saharan Africa: The case of Cameroon. *Oxford Development Studies, 28*, 223–236.
UN. (2006). *Human development report 2006*. New York: Author.
UNAIDS. (1999). *Table of country-specific HIV/AIDS estimates and data, end 1999*. Geneva: Author.
UNAIDS. (2004). *2004 report on the global AIDS epidemic*. Geneva: Author.
UNAIDS. (2006). *2006 report on the global AIDS epidemic*. Geneva: Author.
UNAIDS. (2008). *2008 report on the global AIDS epidemic*. Geneva: Author.
UNAIDS, UNICEF, and USAID. (2002). *Children on the brink 2002: A joint report of new orphan estimates and program strategies*. Geneva: UNAIDS.
UNAIDS, UNICEF, and USAID. (2004). *Children on the brink 2004: A joint report of new orphan estimates and a framework for action*. Geneva: UNAIDS.
UN Department of Economic and Social Affairs. (2008). *Regional dimensions of the ageing situation*. New York: UN.
UNICEF. (2007). *The impact of social cash transfers on children affected by HIV/AIDS*. New York: Author.
UNICEF. (2009). Orphans. Retrieved January 31, 2009 from http://www.unicef.org/media/media_44928.html (n.d.).
UNICEF, UNAIDS, and PEPFAR. (2006). *Children affected by AIDS: Africa's orphaned and vulnerable generations*. New York: UNICEF.
UNAIDS and WHO. (2006). *AIDS epidemic update: Dec, 06*. Geneva: UNAIDS.
UN Population Division. (2005). *Living arrangements of older persons around the world*. New York: United Nations.
UN Population Division. (2008). *World urbanization prospects: The 2007 revision population database*. Retrieved September 24, 2008 from http://esa.un.org/unup/index.asp?panel=1.
UN Statistics Division. (2007). *United Nations common database*. Retrieved June 23, 2007 from http://unstats.un.org/unsd/cdb/cdb_help/cdb_quick_start.asp/ (n.d.).
Watters, K. (2008). *Non formal education and training opportunities for youth living in the rural areas of South Africa* (Association for the Development of Education in Africa's working draft, Doc 2.1.16). Presented at the Biennale on Education in Africa, Maputo, Mozambique.
WHO. (2002). *Report on the global HIV/AIDS epidemic 2002*. Geneva: Author.
World Bank. (2007). World development indicators. Retrieved June 21, 2007 from http://www.worldbank.org/ (n.d.).
World Bank. (2008). *Africa: Overview*. Retrieved September 24, 2008 at http://go.worldbank.org/AVMHFKFVI0.
Zimmer, Z., & Dayton, J. (2005). Older adults in sub-Saharan Africa living with children and grandchildren. *Population Studies, 59*, 295–312.