HIV/AIDS Mortality and Household Composition in Rural South Africa

Enid Schatz, *University of Missouri*
Sangeetha Madhavan, *University of Maryland*

Introduction

The HIV/AIDS scourge has been attaining epidemic proportions in sub-Saharan Africa over the past 10 years. Southern Africa has been hit particularly hard with adult prevalence rates hovering around 22% in South Africa, 21% in Namibia, and 37% in Botswana (UNAIDS 2003). While it is clear that the disease affects entire households and families, there is a need for systematic analysis of these relationships. The few empirical studies on the effects of HIV/AIDS on households suggest a drastic alteration in household organization as well as capacity to cope with the disease. Contributing to this growing body of research on the social and structural impacts of HIV/AIDS, we conduct secondary analyses of data from the Agincourt Health and Demographic Surveillance System (AHDSS) situated in the Mpumalanga province of South Africa. This longitudinal data source provides census information on over 11,000 households in 21 adjacent villages in rural South Africa collected for over a decade. In this paper, we investigate relationships between HIV/AIDS related mortality and the composition of these rural South African households.

Given the unique gender and age distribution of HIV/AIDS mortality, with younger women (20-29) and older men (35-49) having higher mortality rates (Barnett & Whiteside 2002; Baylies & Bujra 2000; Carpenter *et al.* 1999; Loewenson & Whiteside 1998), we expect to find that an HIV/AIDS death in a household results in a gender and age composition that is different from households where there has been another type of adult death, or no adult death at all in the previous decade. This paper tests this hypothesis with empirical data from rural South Africa.

Background

This analysis builds on previous work on household change in Agincourt in the period 1992-2003 (Madhavan & Schatz *in press*). We found that household composition has changed in significant ways over the period. The average household size decreased from 6.5 in 1992 to 6.0 in 2003, while the proportion headed by females increased from 28% in 1992 to 36% in 2003. Within households, the standard dependency ratio decreased significantly from 1.12 to 0.84 while the proportion of households with at least one maternal orphan doubled over the period from 2.8% to 5.5%. Despite concerns about increasing numbers of child headed households, we found that less than 1% of households in the study site were child-headed at both points in time. Finally, we

found no change over time in the percent of households we designated as "skipped-generation" or multi-generational households. There are many factors that could explain these changes including access to employment, increased mobility, fertility decline, to name just a few. In this paper, we focus on the contribution of adult HIV/AIDS mortality in explaining these changes.

The hypothesis driving this analysis has two components: (1) mortality affects household structure and composition beyond the obvious loss of a household member and (2) HIV/AIDS mortality engenders an age and gender distribution that is different from other causes of death. The death of an adult household member has effects beyond simply the loss of that person. Depending on the age and gender of the deceased, there might be a significant change in proportion of members who are working, engaging in child care, etc. The impact of adult HIV/AIDS mortality on a household is multi-faceted with new strains on household resources and increased caregiving responsibilities mainly taken on by women and the elderly (Barrientos et al 2003; Ferriera 2004; Knodel & Saengtienchai 2005; Knodel & Zimmer 2006; Schatz *in press*; Schatz & Ogunmefun 2005). Therefore, coping mechanisms as manifested in particular patterns of household size and composition are likely to be different from other causes of death. These may include specific gender, age, and headship configurations that differ from households that have not experienced an adult HIV/AIDS death. Migration is another strategy to which household members may resort after a death in order to replenish income sources and one that might be more prevalent in households that have experienced an HIV/AIDS related death. Although migration in southern Africa has traditionally been the purview of men, the number of young women migrating from the study area to more urban areas has increased dramatically (Collinson *et al.* 2000, Posel *in press*).

Data and Methods

The Agincourt Health and Demographic Surveillance System (AHDSS) study site is situated in Mpumalanga Province, which has one of the highest antenatal HIV/AIDS prevalence rates in the country: 34.8% in 2005 (National Antenatal Survey 2005). Despite the advent of the availability of antiretroviral drugs at no less than one hospital in the region, there is every indication that the situation continues to worsen. Mortality has worsened in the period 1992-2003, with HIV/AIDS being responsible for 73% of this increase (Kahn et al. *in press*).

The longitudinal AHDSS has collected data annually since 1992 in 21 villages with a population of approximately 72,000 people in 11,600 households. Each update includes (1) household

census, (2) vital events and (3) verbal autopsy (VA) to identify cause of death. The VA is a structured interview conducted within one year of a death. It is administered to relatives or friends of the deceased. It covers symptoms of illness, duration of illness and treatment sought. Two trained physicians then independently examine the data to diagnose probable cause of death. Comparison of causes of VA results with hospital death certificates at the AHDSS fieldsite have demonstrated that the VA provides enough information to make a valid diagnosis for both child and adult mortality (Kahn et al. 2000). In the absence of serotesting, the VA provides a reasonable estimate of HIV/AIDS related mortality in the area. An examination of the validity of the VA instrument for identifying HIV/AIDS deaths in particular is currently underway in the study area (Kahn personal communication). In this analysis, we use the VA data to distinguish HIV-related deaths from other causes of death.

Measures of household composition in this analysis include size, age distribution, gender distribution, and several types of dependency ratios.[1] In addition, we also examine the age and gender of household head, multi-generational residential arrangements, number of temporary migrants[2] in the household, number of foster children in the household and number of maternal orphans in the household.[3] These measures represent features of the household that we believe to be most sensitive to adult mortality, in particular HIV/AIDS related mortality.

We will employ OLS and logistic regression to examine the relationship between (1) the occurrence of a death since 1992 and household structure in 2003, and (2) type of death (HIV-related or other) and household structure in 2003. As of 2003, there were approximately 11,600 extant households and just under 900 households that dissolved at some point between 1992 and 2003. Given that a death could lead to the dissolution of a household, we will conduct a separate analysis of these households to explore whether or not a death, or an HIV/AIDS death in particular, occurred in the short or long term prior to dissolution.

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[1] In addition to the traditional dependency ratio (dependents divided by working age adults), we will also look at other ratios that may pick up local coping strategies, e.g. children under age 18 divided by pensioners (men 65+, women 60+).

[2] Temporary migrants are identified as *de facto* household members by the household head during the annual census, despite the fact that they may spend as much as 6 months time away from the household.

[3] A foster child is defined as a child whose mother does not live with the child, usually due to illness, labor migration or cultural norm. A maternal orphan is defined as a child under the age of 15 whose mother is dead. For each child there is a variable that denotes "mother's status"; mothers are identified as living (in household, village, elsewhere) or as dead. Thus, we can differentiate between orphaned and fostered children. Children are linked only to their mothers in the AHDSS, however, so paternal and double orphans (both parents are dead), as well as children living in households without their fathers, are not identifiable.

Based on existing analyses of verbal autopsy trends, there have been 4,939 deaths spread out over 3,847 households since 1992. We also know that approximately 18% of these households experienced at least one HIV/AIDS death in the period 1992-2003 (761 HIV/AIDS deaths in 693 unique households). While it is clear that multiple HIV/AIDS deaths would engender different effects within the household, small sample sizes do not permit this level of analysis (68 households had more than one HIV/AIDS death). The clustering of deaths is becoming more common in the AHDSS site; therefore, quantitative and qualitative analyses of this type of clustering will be included in future work. Control variables include socioeconomic status of the household and nationality of household members for the ever-experienced death models. The second set of models examining the impact of type of death also will include age and gender of deceased and duration since death. We also will test for interaction effects of type of death and duration since death, gender of deceased and age of deceased.

Preliminary Results

Preliminary descriptive analyses suggest that there are significant differences in household composition between households in which there has and has not been an adult death (see Table 1). The designation 'other causes of death' includes deaths from all causes other than HIV/AIDS or TB (i.e. communicable and non-communicable diseases, as well as violent deaths and accidents). There are differences between household composition measures in households with an adult TB death and those with a death from another cause. These reasons for these differences will be pursued in the final paper. There are few differences, however, in various measures of household composition between households in which there was HIV/AIDS adult mortality and those in which there was a death from other causes. As stated above, in the final paper we will take this analysis further by conducting logistic regressions examining associations between an HIV/AIDS adult death, another adult death, and no death in a household with the various measures of household composition. We will also examine possible interactions, and control for possible intervening variables.

The results from this paper will suggest ways in which household composition are being impacted by adult deaths, both from HIV/AIDS and other causes. These analyses will provide a basis for public health interventions and policy related to the viability of households and particular household compositions in the HIV/AIDS era.

Table 1: 2003 Household Characteristics and Cause of Death[1]

	Households by Specific COD			All Households (N=11664)	
	HIV/AIDS	TB	All Other CODs	All Causes	No Death
Number of Extant Households	434	156	2440	3030	8634
Avg Household Size	7	7	7	6.9	5.8
% Female Headed	46.7	59.5	45.5	46.4	32.1
% Male Headed	53.3	40.5	54.5	53.6	67.9
Avg Age of HH Head	48.8	52.1	51.9	51.5	48.6
Avg Dependency Ratio	0.69	0.69	0.59	0.61	0.64
Avg Female Dependency Ratio	1.7	1.8	1.6	1.6	1.7
Avg Number Generations	2.4	2.5	2.5	2.5	2.2
Percent "Skipped Generation"	6	6	6	6	6
HH with at least 1 maternal orphan	111 (25.6)	21 (13.5)	297 (12.2)	429 (14.1)	217 (2.5)
HH with at least 1 fostered child	77 (17.8)	27 (17.4)	474 (19.4)	578 (19.1)	1220 (14.1)
Number of Dissolved Households (871)	100	57	660	817	54
TOTAL N	534	213	3100	3847	8688

[1] The deaths included in this table only represent the most recent death in each unique household. The paper will examine all deaths in each household.