Title: Food security and household vulnerability in a South African context of high HIV prevalence

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Abstract
To document household-level food insecurity in a context of high HIV prevalence, and to determine whether it differed by whether a household has been affected by HIV/AIDS and other vulnerability factors, we used data from a longitudinal study in KwaZulu-Natal. Food insecurity was high in the cohort: 66% of households reported at least 1-2 days without adequate food in the previous month; 70% reported at least 1-2 months without adequate food in the previous year. Regarding extreme food insecurity, 19% reported >10 days without adequate food in the previous month; 20% reported five or more months without adequate food in the previous year. Orphan households were more likely to report severe food insecurity (23% reporting >10 days in previous month vs.16% for non-orphan households, p=0.0291). Households that reported severe food insecurity in the past month had substantially lower per capita annual income (South African Rand 901 vs. 2707, p<0.0001).

Background
In South Africa, poverty and HIV/AIDS threaten the health and human development of people throughout the life course, from children orphaned by AIDS to HIV-infected adults and caregivers who often care for both orphans and their own adult children living with AIDS. AIDS can overwhelm families by draining resources and diminishing the number of productive workers and caregivers in each household. Even prior to the AIDS epidemic, many households in South Africa were living in poverty, partly due to high rates of unemployment and insufficient work opportunities. Confronted by AIDS, already poor households face enormous added challenges in meeting their basic needs, maintaining food security, keeping children in school, and fulfilling health and child care needs. In KwaZulu-Natal (KZN), the province with the highest HIV prevalence in South Africa and the site of the current study, 39 percent of pregnant women tested HIV positive in 2005(1); 10 percent of households are caring for orphans(2); 61 percent live below the country's poverty line; and the unemployment rate for 2004 was estimated between 26 to 40 percent(3).

For the purposes of this study, a household is considered "food secure" if it meets 100% of its food needs; household food insecurity is characterized by either short-term or chronic lack of access to food(4;5). Using this definition, it is estimated that approximately 14 million South Africans are food insecure, with women, children, and the elderly particularly vulnerable(6). A national survey on food poverty in South Africa estimated that about 43% of households are considered food poor; rural areas (62%), black African households (56%), and female-headed households (52%) are disproportionately affected(7). KZN is the third-most food insecure province in the country behind the Eastern Cape and Northern Cape, as documented by the National Food Consumption Survey(8). In that survey, children's food intake was lowest in

households that were experiencing hunger, and in KZN, a significant association was found between child hunger and low anthropometric status(8).

In general, insufficient food security negatively affects health and quality of life either directly or indirectly through nutritional status(8-10). Poor health in turn can exacerbate poverty through loss of income and productivity(11); loss of income then again fuels food crisis and hunger(12). A few very limited studies suggest that this pattern holds true with HIV/AIDS—that the burden of pre-existing food insecurity intensifies the challenges posed by HIV/AIDS to the already fragile social and economic fabric of many South African families(13), as well as that households affected by HIV/AIDS become more vulnerable to food insecurity due to reduced income and/or care burden. In fact, however, remarkably few studies have examined the prevalence or extent of food security in AIDS-affected households.

Objectives

The goal of the study was to document the prevalence of household-level food insecurity in this cohort, and to determine whether it differed by whether a household has recently been affected by HIv/AIDS (proxied by household orphan status) and other key demographics. Specific research questions include the following:

- What proportion of households experienced food insecurity in the prior 30 days, and in the past 12 months?
- Do levels of food insecurity differ by household orphan status and/or demographics (e.g. household size, gender of household head, income)?

Methods

The study utilizes data collected by the Amajuba Child Health and Wellbeing Research Project (ACHWRP) between September 2005 and June 2007. Sample selection of orphans and their households took place using randomized stratified cluster sampling from 60 of 252 schools in the district. The study population were predominantly Zulu-speaking children aged 9-16, resident in the district and attending school at the time of sampling. Only “recent orphans”, defined as children who had lost one or both parents to any cause during a six month period between March 2004 and August of 2004, were included as “index children”. Three comparison non-orphan children were then randomly selected from the same school, grade, and age as index-orphan children. Study households were classified into three groups: orphan-only, non-orphan-only, and mixed households. Of 637 households enrolled in Round 1, 598 were re-interviewed in Round 2; 24 households relocated out of the district, and 16 withdrew.

The household questionnaire documents the basic household demographic and economic conditions including household size, identity of head of household, and deaths in the previous 12 months. The household questionnaire also captures detailed household-level information on housing type and condition, assets, sources of income by type, receipt of grants by type, and total amount of grants. Questions on food security and care burden were added in Round 2.

To estimate the level of food insecurity in the sample, we first calculated degree of food insecurity for each household, both for the previous month and the previous year (“secure” or “not secure”), then calculated prevalence rates for each measure for the sample as a whole and stratified by household orphan status and other relevant demographic characteristics such as income level and gender of household head; Mantel-Haenszel chi-square tests were used to test for differences in categorical variables such as orphan status or household head gender; t-tests were used for continuous variables such as income.

For the multivariate analysis which is currently underway, logistic regression models were constructed via a combination of forward-stepwise and forced entry techniques to

identify associations between food insecurity and household characteristics and to identify independent household-level demographic, economic, and social correlates of food security, in two separate sets of models (food insecure in previous month and previous year). Those variables that were found to be significantly associated with food insecurity in bivariate analysis were then used to construct multivariate models using the following equation:

$$Food\ security = \alpha + \beta1*orphanstatus + \beta2*factor1 + \ldots \beta n*factorN + covariates + \varepsilon$$

Household demographic and economic characteristics are used as covariates.

This abstract presents preliminary findings from household-level analysis of the food security questions added in Round 2, in addition to questions on household demographics, economics, and care burden. The paper to be presented at the Fifth African Population Conference will include multivariate analysis of the associations, as well as assessment of the interrelationships between food security and household care burden,

Findings

Food insecurity was high among the entire sample, as 66% of households reported experiencing at least 1-2 days without adequate food in the previous month, and 70% reported at least 1-2 months without adequate food in the previous year. In terms of extreme food insecurity, 19% reported more than 10 days without adequate food in the previous month; 20% reported five or more months without adequate food in the previous year.

In bivariate analysis, households that cared for orphans were more likely to report the most severe degree of food insecurity (23% reporting more than 10 days without adequate food in the previous month, compared to 16% for non-orphan households, $p=0.0276$). We found no difference in food insecurity according to gender of household head. Households that reported severe food insecurity in the past month had substantially lower per capita annual income (South African Rand (ZAR) 901 vs. 2707); the finding held with similar income differences for severe food insecurity in the past year ($p<0.0001$ for both associations). Households that received grants were marginally more likely to report severe food insecurity in the past year ($p=0.10$). In initial multivariate analysis, both household orphan status and household income emerged as independent correlates of food insecurity in the previous month.

Conclusions

Although preliminary, our findings suggest that food insecurity is indeed an issue of critical concern in this area of KwaZulu-Natal that is severely affected by HIV/AIDS, as the overall prevalence of food insecurity is very high. It also appears that households recently affected by HIV/AIDS are disproportionately affected, which may further increase their poverty and vulnerability. The relationships with income and other economic and demographic characteristics bear further investigation.

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