HIV-AIDS Morbidity and Mortality: Impact on Intra-Household Time Allocation Decisions of Rural Malawian Women and Men

Introduction

Malawi is one of the countries seriously affected by the HIV-AIDS epidemic. It is the eighth hardest hit in the world, with an estimated prevalence rate of 14.2% at the end of 2003 (Population Reference Bureau (PRB) 2004). HIV-AIDS is the leading cause of death among those aged 20-49 (Malawi Global Fund Coordinating Committee 2002). The US Bureau of the Census estimated that the crude death rate in Malawi was 22.3 deaths per 1,000 population, but that this would have been about half of this (12.0) in the absence of HIV-AIDS (US Bureau of Census 2002). These statistics indicate serious implications of HIV-AIDS on the Malawi economy. In particular, AIDS morbidity and mortality are reported to be reducing the time that adults can spend on income generating activities, with the burden of care largely borne by women (Garbus 2003). However, no systematic analysis of adult male and female time allocation in Malawi has been conducted to show this. This study will analyze determinants of time allocation decisions for Malawian adult males and females using data on about 1,500 currently married women and about 1,000 husbands of these women. The data were collected in 3 districts of rural Malawi in March to August 2004 by the Malawi Ideation and Change project (MDICP) based at the University of Pennsylvania.

Literature Review

Intra-household labor substitution is found to be an important coping strategy of illness afflicted households to compensate for any production loss (Goudge and Govender 2000, Weisbrod 1973, Nur 1993, and Sauerborn *et al.* 1996). In particular, Sauerborn *et al.* (1996) reported that intra-household labor substitution among healthy members was the most frequently chosen strategy to cope with anticipated production losses from illnesses in Burkina Faso. The ability to re-allocate labor among healthy members depends on several characteristics of the household such as household size, dependency ratio and access to resources. Importance of intra-household time allocation analyses cannot be overemphasized. Sauerborn *at el*. (1996) found that in the predominantly subsistence

farming environment of Burkina Faso, much like Malawi, working as a wage laborer at the expense of working on own farm, was used as a last resort coping mechanism among households lacking assets, credit, and kin support. Beegle (2003) also found small but significant scaling back effects on cultivation of some farm crops in Tanzania due to incidence of an adult male death in the household. These studies concentrated on analyzing general illnesses and deaths. However, few studies have attempted to analyze impacts of HIV-AIDS specific illnesses and deaths. Such analyses are important for quantifying socio-economic impacts of HIV-AIDS. In addition, HIV-AIDS specific illnesses and deaths may have different impacts from other illnesses. Beegle (2003) argues that HIV-AIDS deaths are preceded by *severe* debilitating illnesses that limit daily activities and that these illnesses are concentrated among the working group. In addition, future adult deaths after HIV-AIDS illnesses can easily be anticipated, inducing labor re-allocations even before the death (Beegle 2003).

Data

Cross section data on about 1,500 currently married women and about 1,000 husbands of these women collected in March to August 2004 by the MDICP will be used. The MDICP is an ongoing longitudinal survey in three districts of rural Malawi. The districts are from each region of Malawi: Rumphi in the north, Mchinji in the central, and Balaka in the south. The first wave of the survey and village-level data collection (MDICP1) was done in 1998, the second wave (MDICP2) in 2001, the third wave (MDICP3) in 2004, and the final wave (MDICP4) is scheduled for 2006. A comparison with the 2000 Malawi Demographic and Health Survey (MDHS) shows close correspondence with the MDICP1 on key socio-demographic variables. For example, average age of female respondents is 34 for MDICP2 and 28 for the 2000 MDHS, the percent of women with some schooling is 66% for MDICP2 and 69% for the MDHS, and the percent of households that own a bicycle is 56% for MDICP2 and 48% for the MDHS. Thus, even though the MDICP was not intended to be nationally representative (as was the MDHS), it appears to be generally so. In addition, the quality of the MDICP data appears to be high. Interviewer effects are small and equivalent to those in the MDHS data, and reliability analysis based on a comparison of individual responses in MDICP1 and MDICP2 shows that

consistency compares favorably with that estimated for other studies with a roughly equivalent test-retest period (Bignami-Van Assche *et al*. 2003; Bignami-Van Assche 2003).

The original intentions of the MDICP were to examine the role of social networks in changing attitudes and behavior regarding family size, family planning, and HIV-AIDS in Malawi among married women and men. MDICP3 is uniquely different from the past 2 waves in that biomarker data was collected from the survey respondents for HIV and sexually transmitted illnesses (STIs) of gonorrhea, chlamydia, and trichomonas. This gives the MDICP data an advantage (especially in the future) over other data sets in analyses of impacts of HIV-AIDS related illnesses and deaths on household time allocation decisions. In addition, MDICP3 included a time allocation subsection to enable an analysis of differences in time allocation patterns among the women and men who have been affected by incidents of illnesses or deaths in the household. A dairy of work patterns for the previous work day was administered to all respondents, giving information on hours spent on different activities during the day from the time the respondent woke up to the time they slept. Information from the time diary will be used to construct participation of the women and men in the following broad categories of work: own-farm, off-farm wage/non-wage employment, salaried employment, off-farm self employment, and domestic work.

Information on health status of household members will come from the biomarker data and from questions on self-assessed current health by the respondent. The respondents also gave information on their assessment of current health of other household members. The survey includes information on frequency of illness for each of the household members and whether they are currently seriously ill or not. A question on number of deaths that the household has experienced in the past 3 years as well as the ages at which those deaths occurred was also asked. For the current analysis, the paper will use incidence of deaths of adults as a proxy for the potential impact of deaths from HIV-AIDS since HIV deaths can only be identified in MDICP4. There is some justification for using past deaths. Mortality analyses that were based on attrition due to deaths between

1998-2001 showed that adult mortality in the MDICP surveys tripled compared to mortality rates calculated for the period 1980-1990 using life tables published by the Malawi government (Weinreb and Doctor 2002, Doctor 2003). In these studies, verbal autopsies collected on causes of deaths for the respondents that died between 1998 and 2001 also show that about two-thirds of the deaths appeared to be HIV-AIDS related.

Theoretical Framework and Empirical Estimations

The general framework of a household production model will be utilized, in which a household derives utility from leisure and consumption of its own produced goods. The household also has household production functions for farm and home produced goods. The HIV-AIDS illnesses and deaths affect the household productions through the effect on household income and time allocated to the household and farm production.

Cross-section analysis of the data will involve estimating multivariate probit models for time allocation. In addition, hours of work spent on these activities in past work day will be analyzed. This will involve estimations of tobit models for each of these activities for men and women**.** The model to be estimated will be

$$T^j_i = \beta_0 + \beta_1 X_i + \beta_2 Z_h + \beta_3 D_h + \beta_4 I_h + \beta_5 D_h I_h + \beta_6 D_c + \beta_6 D_r + \varepsilon_i$$

where T^j_i is the amount of time that individual i spends on a particular activity j, X_i is a set of individual i's characteristics such as age, education status, type of family they are in (monogamous or polygamous), and whether they are first or second wife. Z_h include the household's production assets such as age and education of household head, and a household asset mix measure, D_h is a dummy for incident of a past death in the household (using past 1 year and past 2 or 3 years in separate regressions), I_h is a dummy for incident of illness constructed from biomarker and health information, $D_h I_h$ is an interaction term of the death and illness dummy variables, D_v is a set of village characteristics and D_r is a regional dummy.

We expect the incidents of deaths and HIV and other illnesses to affect men and women differentially due to gendered nature of division of labor in Malawi (Nankhuni and

Findeis 2003). The direction of impact on the different activities is not obvious. However, larger impacts on domestic responsibilities for women than for men are expected.

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