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ANALYSIS OF ADULT MORTALITY WITHIN RURAL HOUSEHOLDS IN MOZAMBIQUE AND IMPLICATION FOR POLICY*

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BACKGROUND: This paper has four main objectives: 1) To present a cost-effective method of investigating the effect of prime-age mortality on rural households by adding a mortality component to on-going nationally-representative household surveys; 2) to investigate who is afflicted with prime-age mortality due to illness, by analyzing the characteristics of the deceased individuals (gender, age, and position within the household at the time of death) and of the affected households (geographic location, and ex post income and landholding); 3) to investigate how the households with prime-age (PA; 15-49 years of age) adult death or illness respond by adjusting household composition and their agricultural activities; and 4) to discuss the implications of household responses to PA adult death for agricultural policies and programs, and for their role in mitigating the effects of PA adult mortality.

To this end, information on household demographics for the 1999-2002 period is used to analyze changes in household size and composition for both affected and non-affected households. Next, information from the death/departure and illness demographic survey components about household response strategies are evaluated by characteristics of the deceased individual as well as of the household to better understand the factors that influence the choice of adjustment response.

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DATA AND METHODS: Mozambique's Ministry of Agriculture and Rural Development (MADER) included a demographic/health/ mortality component in its nationally-representative rural household survey (n=4908) primarily oriented toward obtaining agricultural and income information (TIA 2002). This approach enables us to examine empirically the impact of (PA) adult mortality on rural households' demographic composition, agricultural production, cropping patterns, and incomes. We use incidence of PA adult mortality due to illness to identify households that are most likely affected by AIDS-related mortality. Because of the strong contribution of AIDS deaths to total deaths in the PA range in high-prevalence countries (Ngom and Clark, 2003), cases of adult mortality due to illness give a good indication of the effects of AIDS-related death. For example, we find a high Pearson correlation (54%) between Urban/Rural Adult HIV prevalence by province (2001; from antenatal sentinel site data) and Rural Adult Mortality Rates due to illness (1999-2002) from the TIA 2002 survey. Our principle methods of analysis include: 1) Descriptive analysis of post-death mean/median household outcomes between affected households (those with a PA adult death) and non-affected households (those without a PA adult death); 2) Analysis of qualitative data on household responses to PA adult illness, death, and departure; and 3) Probit regression analysis of factors influencing household strategy responses.

FINDINGS AND POLICY IMPLICATIONS: While not all PA adult deaths due to illness in Mozambique can be attributed to HIV/AIDS, this paper presents evidence from this and other research that suggests a strong relationship between PA adult mortality and HIV/AIDS, and thus enables households with a PA death due to illness to serve as a reasonable proxy for HIV/AIDS-affected households.

Although rural income growth from 1996-2002 mirrored the impressive macroeconomic growth (50% growth in mean per capita real income during 1996-2002) during this time period, results from TIA 2002 show that rural household incomes in Mozambique are still very low and their distribution is highly unequal. Within this context of widespread rural poverty and stagnant agricultural

productivity, HIV/AIDS prevalence in Mozambique has increased dramatically since the mid-1990s.

The recently released 2002 HIV/AIDS statistics from a survey of 36 antenatal clinics (predominantly urban) indicate an overall HIV prevalence of 13.6% nationally, although provincial estimates range from a high of 26.5% in Sofala, a coastal trade city in the Center to 7.5% in Cabo Delgado, a relatively remote province in the North. Basic mortality statistics from TIA 2002 show that 4.2% of households suffered the death of a PA adult from January 1999 to September 2002, most of which were due to illness, while another 2.7 % of households had a PA adult currently suffering from a prolonged illness during 2001/02.

Literature and popular discussion on AIDS in rural Africa typically associates HIV/AIDS-related mortality with household heads and their spouses. By contrast, TIA survey results show that only one-third of the deceased PA adults in Mozambique were household heads/spouses. A potential implication of this finding comes from recent research in Kenya (Yamano and Jayne, 2004), which found that households with a head/spouse death tended to suffer larger impacts on household composition, cropping, crop income, and assets. Assuming that a similar relationship exists in Mozambique between the household position of the deceased and the magnitude of effects, we might expect the relatively low proportion of head/spouse deaths in Mozambique to lessen the potential magnitude of prime-age mortality on household livelihoods.

Although some literature and popular discussion suggests that affected households face severe agricultural labor constraints, this paper presents several basic demographic findings that suggest that such constraints are not likely as severe as predicted, at least for many affected households. First, because affected households are on average larger than non-affected households prior to a PA adult death, their post-death labor availability is comparable to that of non-affected households. Second, nearly one in eight households with a PA adult female death bring in a new PA adult female, thus at least partially replacing the economic activity of the deceased. Third, average post-death land/labor ratios of affected households are not significantly different from those of non-affected households.

These results demonstrate the heterogeneity of household labor endowments and responses to PA adult death among affected households, which questions the general assumption that affected households face severe agricultural labor constraints.

It is also often assumed that the effects of PA adult mortality on household agricultural production and income will result in the impoverishment of many affected households. Although affected households may have incurred significant losses of income and/or land access (we do not investigate this in this paper due to data limitations), the survey findings demonstrate that the average *ex post* (post–death) income of affected households is not significantly lower than that of non-affected households. This finding suggests that effective targeting of mitigation programs, such as food aid, for HIV/AIDS-affected households would be difficult, as only some affected households appear to be poorer than non-affected households.

Certain sub-groups within the affected households (those in the Center which have suffered the death of male head/spouse, for example) do appear to have lower median incomes or land holdings after the death (e.g., some widow-headed households or those with high dependency ratios). Given the importance of careful targeting to reach the "hardest-hit" households while minimizing negative overall income and productivity growth effects of food aid, the results suggest that further empirical and practical investigation is required.

Analysis of strategies adopted by affected households in response to PA adult mortality shows that 44% reduced their crop area while 22% reduced weeding on existing area. This suggests that not all affected households appear to face a binding labor constraint in agriculture. Probit regression analysis shows significant effects of household compositional changes, characteristics of the deceased, and region on the probability that an affected household will reduce cultivated area in response to a PA adult death. This further demonstrates that household responses to adult mortality are more heterogeneous than depicted by some of the literature, and implies limited potential demand by affected households for labor-saving agricultural technologies (LSTs).

While some literature recommends that priority be put on developing labor-saving agricultural technology in response to AIDS-related labor loss (du Guerny 2002), there are several reasons to question this strategy, especially as a blanket recommendation. Given scarce financial and human capital resources in Mozambique, decision makers should consider how the potential returns

to labor-saving technologies (LSTs) for agriculture might compare with technologies which could reduce labor demands for household domestic tasks such as food processing (hammermills or other food processing technologies for maize and cassava) and gathering water and fuel (community wells; fuel-efficient stoves).

Available time-use data from neighboring Zambia (Blackden, 2003) suggests that the returns to investing in LSTs for such domestic tasks is likely to be higher than for LSTs in agriculture given that more hours per household would likely be saved by the former, and that such technologies would also benefit many poor but non-affected households.

More fundamentally, the development and dissemination of agricultural LSTs faces the challenge that the Mozambican agricultural research and extension system currently is able to reach relatively few farmers. Shifting the focus of the limited financial and human capacity of the national agricultural research and extension system to respond to the needs of a relatively small group of geographically-dispersed farm households would undoubtedly strain the capacity of the system, and may divert resources from the development and dissemination of technologies appropriate for the vast majority of farm households. Another complication is that additional resources will likely be required to effectively target affected households due to their geographic dispersion and heterogeneity of land/labor ratios.

Caution is therefore warranted before scarce agricultural research funds are inordinately diverted to labor-saving crop and input technologies intended for HIV/AIDS-affected households. Given the extent of rural poverty and the need for broad-based rural economic productivity growth in Mozambique, these results indicate that policy makers must find an appropriate balance between investments in long-term rural economic productivity growth and targeted assistance to AIDS-affected households and communities.

Results from other studies suggest that poorer rural households headed by HIV/AIDS widows are in especially precarious positions (Mather et al, 2004). Targeted assistance to the 'hardest-hit' affected households need not only include, where possible, food aid and appropriate technology, but also improved land tenure security for widows and the development of land rental markets could enable such households to hold on to their land assets and to earn income from allowing others to make productive use of their land. Finally, addressing the gender bias in agricultural production and marketing knowledge and cash crop and non-farm opportunities could contribute significantly to improved income potential for many households, especially those which lose a male head and are subsequently less likely to have access to cash crop and/or non-farm opportunities.

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* The report which this "flash" reviews is available at: http://www.aec.msu.edu/agecon/fs2/mozambique/researchreports.htm

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