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A CROSS-COUNTRY ANALYSIS OF HOUSEHOLD RESPONSE TO ADULT MORTALITY IN RURAL SUB-SAHARAN AFRICA: IMPLICATIONS FOR HIV/AIDS MITIGATION AND RURAL DEVELOPMENT POLICIES

by

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BACKGROUND: A general assumption in some of the literature and in popular discussion is that AIDS-related mortality results in severe labor constraints and increased poverty rates and land scarcity among affected households. The subsequent implication of these assumptions is that HIV/AIDS mitigation policy should prioritize technology and assistance targeted to affected households: agricultural labor-saving technologies and food aid.

Yet there is surprisingly little empirical research to date which can confirm whether this scenario is generally representative of affected households, and how affected household behavior and welfare compare with the non-affected household population. It is not clear that these suggested mitigation policies are appropriate for a majority of affected households and more feasible or desirable relative to alternative investments. In particular, it is also important to seek empirical information to establish the potential for effective food aid targeting in areas of high HIV incidence, while also minimizing negative overall rural income and productivity growth effects.

OBJECTIVES: This paper synthesizes across the results of a set of country studies on the effects of prime-age adult mortality on rural households in Kenya, Malawi, Mozambique, Rwanda, and Zambia, each of which is based on large representative rural household survey sets (Table 1).[1] These findings have implications for the design of efforts to mitigate some of the most important effects of rural adult mortality, and for key development policies and priorities.

Table 1. Selected Characteristics of Rural Household Survey Datasets For Country Studies

Country (Year(s) of Survey)	Sample Size (Population Representation)	Type of Survey	Recall Period of Mortality Information
Kenya (1997,2002,2002)	N=1422 (Smallholders in ag-oriented provinces	Panel	4 yrs. 1997-2000 6 yrs. 1997-2002
Malawi (1990, 2002)	N=420 (Smallholder maize growers in major growing regions	Panel	13 yrs. 1990-2002
Mozambique (2002)	N=4908 (Nationally of small & medium holders	Cross Section (with recall panel on hh composition)	4 yr. recall 1999-2002
Rwanda (2002)	N=1395 (Nationally of smallholders)	Cross Section (with panel on crop area and prod.)	4 yr. recall 1999-2002
Zambia (2000)	N= 6922 (Nationally of smallholders)	Cross Section	5 yr. recall 1996-2000

FINDINGS:

First. We demonstrate that using incidence of prime-age adult mortality due to illness in rural household survey data is a reasonable and cost-effective way to identify households that are most likely affected by HIV/AIDS-related mortality. Because of the strong contribution of AIDS deaths to total deaths in the prime-age range in these highly-infected countries, cases of adult mortality due to illness give a good indication of the effects of AIDS-related death. We likewise document rural adult mortality rates consistent with significant HIV/AIDS deaths in rural areas, and the comparison of these findings to results estimated from sentinel site HIV prevalence data is internally consistent (Table 2). Panel data in Kenya, Malawi, and Rwanda enable us to show that household dissolution rates across these particular surveys are relatively low, and thus lend credibility to the reliability of our estimates of the effects of prime-age mortality on household welfare.

Second. In contrast to the general assumption that HIV-related mortality is typically associated with household heads/spouses, the survey findings show that in four of the five countries researched here, a majority of deceased PA adults are not household heads/spouses, and thus not likely to be the primary breadwinners of the household. This suggests that the potential magnitude of rural PA mortality on rural household agricultural and off-farm incomes and orphaning rates may be less than those predicted by some of the literature. It also helps to explain the relatively low household dissolution rates found in the Kenya, Malawi, and Rwanda panel data sets. When comparing the pre-death household position of deceased individuals with the household position of individuals in non-afflicted households, several

noteworthy points emerge (Table 3). In four of the five countries examined, the proportion of deceased females who were heads or spouses of heads in their households is lower than the proportion of female heads or spouses in non-affected households.

The emerging picture is one of younger female dependents being the primary casualty of prime-age adult mortality, not wives or female heads. The picture is more complicated among men. In Kenya, Malawi, and Rwanda, the proportion of deceased males who were heads or spouses in their households is higher than the proportion of male heads/spouses in non-affected households, while in Mozambique and Zambia, it is the reverse. While death of any kind undoubtedly brings hardship and suffering to affected households, it is important to note that the magnitude of the economic consequences appear to vary according to the extent to which the deceased tend to be primary breadwinners and core members of the household.

Third. In the case of Kenya, Malawi, and Rwanda, it appears that the rural HIV vectors associated with the infection of recently deceased rural adults (i.e. who were infected 5-10 years ago) are not associated with higher relative income and education, as has been found in previous research in Eastern Africa. The implication of these findings is that rural HIV prevention programs in these countries would require a broad range of media to reach both the illiterate and more educated rural population. In addition, these types of findings demonstrate that representative socioeconomic information on deceased and non-afflicted rural adults can be valuable in the design of HIV prevention programs.

Table 2. Survey Findings on Rural Adult Mortality from Illness by Country

Country (Mortality Recall Time Period)	No. HH's With at Least One PA Death #	HH's With at Least One PA Death %	Rural Adult Mortality Rate PA Adults /1000 person yrs)	National Adult HIV Prevalence(Antenatal Sentinal Sites)	
				%	Year of Antenatal Survey
Kenya (4 yrs)	83	5.8	4.9	13.5	2000
Malawi (13 yrs)	72	17.1	9.4	15.0	2001
Moz. (4 yrs)	202	3.7	5.2	13.6	2002
Rwanda (4 yrs)	96	6.0	4.9	8.9	2001
Zambia (5 yrs)	574	8.0	7.4	19.6	1999

Table 3. Household Position of Deceased and Non-Affected Prime-Age Adults by Country

Country	HH Position	Non-Affected Individuals			Deceased Individuals		
		Male	Fem.	All	Male	Fem.	All
		--------- column % ----------			-------- column % -----------		
Kenya	Head/Spouse	24	34	29	59	27	44
	Other Member	76	67	71	41	73	56
Malawi	Head/Spouse	38	54	47	55	54	54
	Other Member	62	46	53	45	46	46
Moz	Head/Spouse	60	69	65	40	13	27
	Other Member	40	31	35	60	87	73
Rwanda	Head/Spouse	47	53	51	56	44	49
	Other Member	53	47	49	44	56	51
Zambia	Head/Spouse	62	76	69	49	44	46
	Other Member	39	24	31	51	56	54

Fourth. In contrast to the general assumption of labor scarcity among affected households, results of household composition analysis demonstrate that affected households do not uniformly appear to have less available PA labor than non-affected households, either because those affected are able to attract new PA members or because they had more PA adults prior to death. This demonstrates the heterogeneity of available ex post PA labor among affected households, and the importance of differentiating among affected household outcomes by characteristics of the deceased individual such as household position. Importantly, higher mean dependency ratios are found in households with a head/spouse death, thus women in these households may well face increased demands on their time for domestic tasks and crop production.

Fifth. The results question the usefulness of a homogeneous conceptualization of "affected households," especially in the context of proposals for targeted assistance, technology development, and other programs/policies. We find that in most cases, although affected households may well have suffered negative effects on household crop production and income, the average affected household has similar ex post land cultivated, total land area, cultivation rates, and total income. But perhaps most importantly, we find that the gender and household position of the deceased appear to strongly condition the effects on the household.

Overall, these findings suggest that poorer households headed by HIV/AIDS widows are in especially precarious positions.

Sixth. The heterogeneity of both the ex post welfare indicators and the magnitude of the effects of adult mortality on household crop production and income have important policy implications. For example, the finding that many affected households have similar household income and land/labor ratios in comparison with their non-affected neighbors suggests that it will be difficult to effectively target food aid, other assistance, or technologies to a homogeneously-defined group of "affected households." Yet certain sub-groups of affected households may well have lower median incomes or land holdings after the death, as appears to be the case with households that have lost a male household head. It should be noted that this involves less than a third of cases in all the countries in this study. Given the importance of careful targeting to reach the "hardest-hit" households while minimizing negative overall rural income and productivity growth effects, the results suggest that further empirical and practical investigation will be required. Another important consideration is the need for targeting to be undertaken in ways that avoid creating incentives for husbands to leave the area so that households can qualify as "female-headed" in order to obtain assistance.

Seventh. The evidence presented here is mixed as to how adult mortality is affecting cropping patterns. The ex post data on crop cultivation cannot speak to potential changes in crop cultivation across the country studies - namely, a shift among affected households towards roots and tubers and a shift away from higher-value crops. Yet the ex post results show that affected households do

not tend to have more relative area cultivated to roots and tubers compared with non-affected households.

However, analysis of mortality effects on cropping patterns in Kenya demonstrates that there are some shifts, although these are strongly conditioned by the gender and household position of the deceased and the initial asset level of the affected household. In Rwanda, controlling for general cultivation shifts among the non-affected households due to changing relative prices, there was a significant increase in production of sweet potatoes among affected households, and a significant decrease in coffee production. These results suggest that some affected households are shifting to less remunerative crops due to either labor constraints or the inability to retain specific production/marketing knowledge of certain cash crops that is lost in the case of a male death. 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.

Eighth. The lack of widespread effects on crop income among affected households as well as similar cultivation rates and area cultivated to roots and tubers relative to non-affected households questions the potential demand for many proposed labor-saving technologies (LSTs) for agriculture. These results suggest that for affected households as a group, the loss of family labor due to a death in the household may not necessarily mean that agricultural labor becomes the limiting input in agricultural production. The macro-level picture emerging from recent demographic population projections, which include the impact of AIDS-related deaths, demonstrates that although the epidemic will reduce life expectancy and population growth considerably in the hardest-hit countries, the epidemic will probably not result in a decline in the aggregate labor-to-available-land ratio. However, at the micro-level, the loss by some households of land, farm assets, and skilled labor may result in greater income and asset inequality.

Ninth. Available time-use data from Zambia suggests that the returns to investing in LSTs for domestic tasks such as food processing and water/fuel gathering is likely to be much higher than those 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. 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. Emerging results from concurrent research drawing on the databases used in the present research will help inform questions of the extent of rural poverty and the kinds of programs needed to help stimulate broad-based rural economic productivity growth in the synthesis countries.

Tenth. In closing, it is important to highlight what we believe may be important, but have not been able to study. One such area for further research is the linkages between affected households and communities, as we will address in cooperating with RENEWAL on a study in Zambia on the interaction between households and communities affected by the AIDS epidemic. Finally, emerging evidence suggests that the poorer strata of households in rural areas are increasingly likely to be victims and to suffer the most severe welfare losses resulting from adult mortality. If additional research confirms these patterns, there will be important HIV/AIDS mitigation as well as prevention implications that are inescapably tied to the need for greater emphasis and attention on agricultural and rural economic development policies to redress constraints to pro-poor and gender-sensitive economic growth. Likewise, research to develop more effective technologies and policies that can foster broad-based rural income growth will better enable communities as well as households to respond to those hardest-hit by the negative effects of AIDS-related adult mortality.