IMPACTS OF PRIME AGE ADULT MORTALITY ON RURAL HOUSEHOLD INCOME, ASSETS, AND POVERTY IN MOZAMBIQUE: ANALYSIS WITH THE TIA PANEL DATA SET

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KEY FINDINGS

Using a three-year panel of 4,058 Mozambican households surveyed in 2002 and 2005, we measure how prime-age (PA) adult mortality due to illness affects rural household size and number of adults, crop and non-farm income, total household income, and asset levels.

1) Effects of PA mortality vary considerably by the gender and household position of the deceased individual as well as by region. Results show that when PA males die, households are less able to bring in new adult members, are more likely to lose access to livestock and landholdings, and to suffer income effects. Households in the North/Center with a PA male head death average 25% loss in crop income; in the South, PA male death is associated with an 88% reduction in non-farm income.

2) In spite of these income reductions, net income per adult equivalent (AE) among households with a PA death is not significantly different from those households without a death. Households with a death are also not any more likely than other households to have net income in 2005 below the expenditure-based poverty line.

3) Nevertheless, asset losses, demographic and income shifts all point to vulnerability to future income and asset shocks, especially households with a PA male death.

INTRODUCTION: HIV/AIDS is not the only life-threatening disease in Mozambique, but its rise has resulted in increasing mortality rates in the most productive years of people in rural areas. With an estimated HIV prevalence rate of 16.4% in Mozambique, policy makers are challenged to develop poverty reduction and economic growth strategies given the loss of many working adults. To understand the dynamics in households with adult deaths, it is critical to look at the household both before a death takes place and after, as they struggle to retain people, assets and income in spite of the loss.

While most surveys related to HIV/AIDS are developed by health professionals and look at the health and nutrition related components, this survey was guided by agricultural professionals, using techniques from the health field, but taking a unique approach to the broader aspects of rural household livelihoods.

This research uses Mozambican panel data to look at the short-term dynamics of rural households that have faced the loss of a prime age (PA) adult (15-59 years of age) to understand if and how policies and interventions might be developed to respond to the epidemic. The research evaluates the impact of PA adult mortality (and to a limited extent, morbidity and elderly mortality) on the following aspects: demographics of rural households; land and livestock assets; income from various sources (crops, non-farm, and total income); and poverty and mobility above and below the poverty line. The research looked at the gender of the person who died and their role in the household, to determine if those factors might affect the impacts. Additionally, regional differences are evaluated. Finally, given the identified impacts and factors influencing the impacts, researchers identify the implications for policies and interventions.

METHODS AND DATA: There was initial work on mortality effects with TIA 2002 (Mather et al., 2004), but without following households over time, it was difficult to understand the dynamics of income and other aspects. In 2005, Ministry staff revisited 4058 households of 4908 households in TIA 2002 for a panel data set over the period 2002-2005. The TIA 2005 survey instrument covers most of the same topics as TIA 2002. The panel is particularly valuable in assessing the impact of adult mortality since knowledge of prior assets, income, and demographics allows us to measure the changes more accurately. The early work indicated that it matters whether the person who dies is male or female, so that is one key characteristic in analyses. Regional differences are also examined here, due to differing livelihood systems, demographics, and HIV/AIDS transmission vectors between the South on one side and the North and Center on the other. For technical details on how the panel data set analysis was conducted and statistical problems were considered, see Mather and Donovan 2007.

EFFECTS ON HOUSEHOLD COMPOSITION:
Intuitively, we expect that if a household loses one adult member to HIV/AIDS or other illness, the change in number of adults will be -1. However, Mozambican rural households are dynamic, with many reasons for entry and exit of members. Preliminary analysis, simply looking at number of household members, comparing the households without a death to households with a male or female death, shown in Figure 1, households with a male death demonstrate a reduction in prime age adults, the key labor source for households.

Table 1 demonstrates the results using multiple regression techniques. On average, a PA male death results in a significant loss of 1.1 adults, whereas a female death results in a loss of 0.3 adults. When we look at the changes in adult equivalents (AE) (incorporating elderly and children into the estimate), the difference is even more dramatic (-1.27 AE with a male death versus -0.34 AE with a female death). Analysis shows that when household lose an adult female, they generally incorporated a new female adult member through re-marriage or other means. However, when a male dies, households have a much harder time attracting a new male to enter.

Figure 1 Number of Prime Age Adults (15-59) in TIA 2002 and TIA 2005
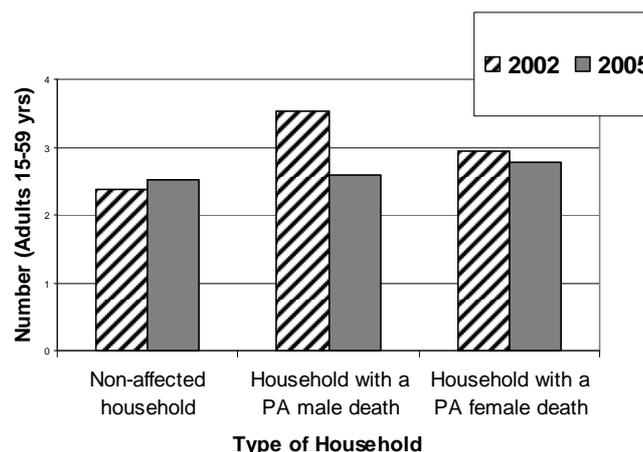
EFFECTS ON LANDHOLDING AND LIVESTOCK ASSETS: Land tenure is a complicated issue in Mozambique due to the mixed system for attributing land use rights (traditional customary allocation and administrative allocation). Matrilineal systems are found more frequently north of the Zambezi River, whereas patrilineal systems predominate in the rural areas of the South. As shown in Table 1, there are significant effects on landholding and livestock assets, depending on who has died and the region in which the household is located. In the North and Center, death of an adult male significantly reduced household landholdings by 20%, while the livestock assets declined an average 34% using Tropical Livestock Units in cattle equivalents. As shown in the full report, when stratified by role in the household, the death of a PA male head is significant in the North/Center, whereas there is a significant reduction when a non-head (or spouse) male dies in the South.

EFFECTS ON INCOME: Given that a PA death may have different impacts depending on the source of income, the research looked separately at net crop income, cash crop income, grain income, off-farm income (including remittances), and total income. The key results are highlighted in Table 1. Looking first at net crop income, with a PA male death nationally there is highly significant reduction of 42%, compared to a statistically non-significant small decline with PA female death. PA male death effect is strongest in the North/Central region.

Table 1 Impact of Adult Mortality on Household Demographics, Assets, and Income, by Gender and Region											
	National				**Center/North**				**South**		
	PA male death		PA female death		PA male death		PA female death		PA male death		PA female death
		**				**					
No. of adults	-1.049	*	-0.254	*	-1.038	*	-0.318	*	-1.073	**	-0.135	ns
Landholding	-20.5%	**	-18.3%	*	-20.2%	*	-22.0%	*	-20.0%	ns	-10.8%	ns
Livestock	-34.3%	**	9.7%	ns	-37.9%	**	4.3%	ns	-21.6%	ns	17.4%	ns
Crop income	-41.5%	**	-8.0%	ns	-49.4%	**	-13.5%	ns	-10.9%	ns	4.1%	ns
Non-farm income	-72.9%	**	25.7%	ns	-63.4%	ns	94.3%	ns	-88.9%	**	-54.1%	ns
Total income	-25.2%	**	18.4%	ns	-26.4%	**	11.9%	ns	-21.3%	ns	26.1%	ns
Total income/AE	3.8%	Ns	37.4%	ns	1.6%	ns	40.8%	ns	9.4%	ns	27.3%	ns

Source: TIA 2002 and TIA 2005.
Note: NS = not significant; * = significant at 10% level; ** = significant at 5% level; and ***=significant at 1% level. PA=Prime age (15-59 years).

For non-farm income, the death of a PA adult male has a significant negative impact on non-farm, especially in the South, with an average decline of 89%. Further analysis will need to look at non-farm income sources to understand how remittances and other sources shift, depending on who dies and their role in the two basic regions, as the disaggregated results found in the full report are contrary to prior belief of a negative impact on non-farm income.

When all sources of income are combined, only a PA male death significantly reduces net household income, by an average of 25%. When further evaluated, the reduction is strongly associated with a male head death in the North/Center. The lack of significant effect of a female death may be related to two key aspects. One, many households brought in new adult members when an adult female died, minimizing the labor loss to the household. Secondly, female labor tends to be associated with unskilled labor for which it is easier to find substitutes. When a male dies, especially a male head of household, the household is often unable to bring in a new male adult, so the household loses the labor of the male, but also the skills and social capital of that male.

When we evaluate the net household income on per adult equivalent (AE) basis, we find that the affected households appear to be similar to non-affected households, and there are no significant net impacts of the PA adult deaths on income/AE. When the number of adults declines, there are lower AE values, but also lower consumption demands on the household as a whole. Since these results are only for the short term, the losses of assets may over time result in losses in income/AE that are not evident here.

EX-POST POVERTY AND MOBILITY ABOVE AND BELOW THE POVERTY LINE: To evaluate the possibility that households with a death are more likely to become poor after a death, researchers used an estimated expenditure poverty line from the national *Inquérito dos Agregados Familiares* (IAF) for net household income/AE. The researchers determined the shifting of households between three groups: 1) poor (households below the poverty line); 2) extremely poor (households with net income/AE below 50% of poverty line); and non-poor (households above the poverty line). The results in Table 2 show that there is extensive income mobility for both affected and non-affected households. Affected households show no greater tendency to fall into poverty than other households on aggregate looking at the 2002-2005 period.[1]

Table 2: Mobility above and below the Poverty Line, 2002-2005		
	Type of Household	
Poverty Categories	**With at least 1 PA death**	**With no PA deaths**
	(% of households)	
Stayed Poor	49.7	50.4
Became Poor	18.2	15.3
No longer Poor	21.5	17.1
Stayed Non-poor	12.8	14.9

1 The more disaggregated results found in the full report suggest that households with a PA male death are more likely to fall or remain below the poverty line.

POLICY IMPLICATIONS:

Policy Implication 1: Heterogeneity of affected households and impacts. Our findings that mortality impacts vary significantly by the gender and household position of the deceased, in addition to region in which the household lives. These findings suggest that "affected households" are not a homogenous group. Indicators beyond 'adult mortality' are required to help identify affected households most in need of immediate assistance, such as households with a male head death and/or those with low asset and nutritional indicators. In addition, different interventions may be needed, depending upon the types of losses suffered by the household.

Policy Implication 2: Regional Determination of Effects and Needs. Since households, their livelihood strategies, and the impact of an adult death vary by region, mitigation strategies and programs should be developed to address the key losses for each region. In the North and Center, there are high losses to crop income when a male dies, indicating the need to ensure income opportunities for women left as widows. In the South, male deaths result in high non-farm income losses, such that women in the South need to have greater access to the high value nonfarm income opportunities to avoid becoming poor when their spouse dies.

Policy Implication 3: **Need to Address Resiliency.** Land and livestock losses accompanied by the loss of adult labor and skills point to vulnerability to future shocks, in spite of 2005 net income/AE patterns which are similar between the two household groups. Interventions can be designed to replace livestock assets in the South or to ensure land access by widows and their children. In households with a male death, these actions would help them to attract new adult members.

Policy Implication 4: Policies and Interventions Can both Attack Poverty and the Effects of HIV/AIDS.
While it is important to provide a safety net for the hardest-hit households to protect their assets, investing in pro-poor agricultural productivity growth is likely to be an effective means by which to respond to the HIV/AIDS epidemic in rural Mozambique. Policies to reduce poverty and promote growth are also valuable in the context of HIV/AIDS and other illnesses, especially those policies that seek to ameliorate lack of opportunities for women in income generation (cash crops, non-farm) which may relate to educational and agricultural extension strategies

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