

Household Responses to Prime Age Adult Mortality in Rural Mozambique: Implications for HIV/AIDS Mitigation Efforts and Rural Economic Development Policies

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Motivation

- Mozambique's economy is highly dependent on agriculture
- Estimated HIV Prevalence rate of 13.2% among adults
- Department of Policy Analysis and Department of Rural Extension are assisting in developing the Ministry of Agriculture's strategy to deal with HIV/AIDS

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Motivation (cont)

- Simple economic logic posits that AIDS is associated with labor losses (during illness and with death) and thus labor-saving technology should be the focus of agricultural research and extension
- Questions:
 - What is the effect on agricultural labor (quantity, quality)?
 - Will labor-saving technology in agriculture help address potential constraints?
 - As a result, should Mozambique's public sector agricultural investments focus on these technologies?

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Objectives

1. To evaluate demographics changes in households with a prime-age death, using nationally representative household survey data, to understand HH labor availability
2. To determine the strategies used by households to respond to illness/death
3. To identify implications for design of **agricultural** programs and policies, in a context of overall policies

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Background: Mozambique

- Mainly rural, with 80% of population in rural areas, involved in agricultural sector; 75% of income from agriculture
- Small-scale, subsistence agriculture, with limited market participation and little use of purchased inputs
- Three main regions:
 - South
 - Center
 - North
- Medium/high HIV prevalence: 13.2% nationally
 - High variability (rural/urban; regions)

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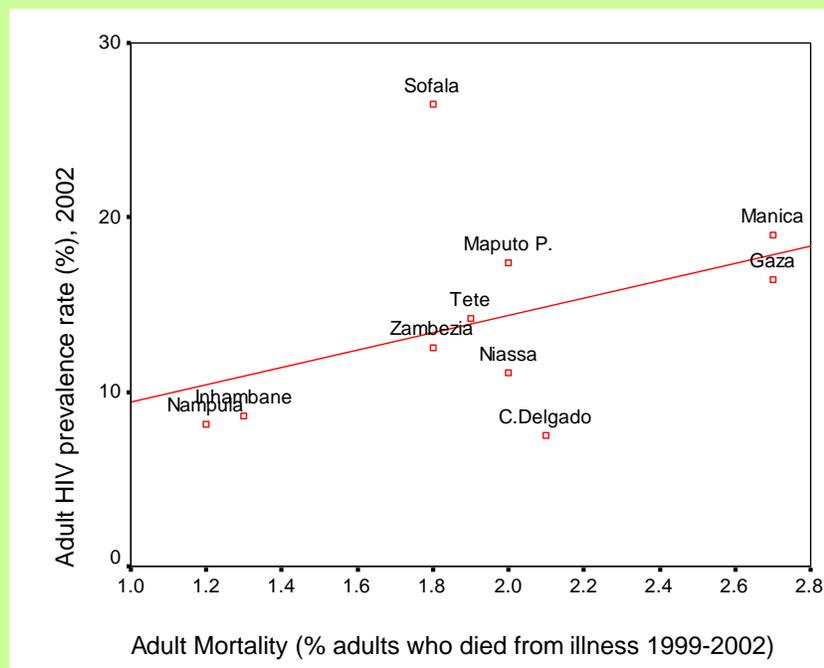
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Methods

- Add demographic and mortality component to TIA 2002 survey:
 - TIA: Nationally representative household survey:
 - Agricultural production, income, assets, market participation
 - Mortality component asked HHs about individuals who died over past ~4 years: year of death, cause of death, etc.
- Use prime age adult deaths due to illness (declared by respondents) as a proxy for HIV/AIDS deaths
 - Prime age adults: 15-49 years
 - Compare “non-affected” HHs with “affected” HHs

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Figure 1. Provincial HIV Prevalence Rates for 2002 (Urban and Rural) and Rural Adult Mortality 1999-2002



Source: Ministry of Health, November 2003 and TIA, 2002. Adults 15-49 years.

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Age and Sex Distribution of Adults Who Died of Illness Compared to Non-Affected Adults

1. Non-Affected Adults:

15-24 yrs. M=41% F=42% Total=41%

25-49 yrs M=59% F=58% Total=59%

2. PA Adults Who Died of Illness:

15-24 yrs. M=21 % F=31 % Total= 27 %

25-49 yrs M=79 % F=69 % Total= 73%

→ Deceased generally older than general population

→ Deceased men generally older than deceased women

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TIA 2002 Rural Mortality Information

Table 2. Distribution of Adults Who Died of Illness Compared to Other Adults, Based on Role In Household And Age Groups

Category	% of Non-Affected PA Adults		% of Deceased PA Adults	
	Head / Spouse	Other	Head /Spouse	Other
All PA Adult Age Groups	65 %	35 %	27 %	73 %
15-24 yrs	34 %	66 %	7 %	93 %
25-49 yrs	86 %	14 %	35 %	65 %

→ Many who died are not head or spouse

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Household Characteristics

- Income and Income/AE:
 - Median values lower for HHs with male death, esp. in Center
 - Generally spread evenly across income quartiles (except male death in Center, more likely in lower 2 income quartiles)
- Cultivated land area:
 - Generally lower among affected households
 - 1.05 ha for non-affected vs. 0.88 for affected
 - % cultivated: Lower, esp. for male death in South and North
- Regional differences in demographics:
 - South: More PA adults in HHs, more elderly, larger HH size (5.5 persons in 2002)
 - North: More “nuclear” HHs, with fewer PA adults, smaller HH size (4.5 in 2002)
 - Center: Basically between the two in terms of PA adults, dependency ratios, etc.

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Demographic changes: Difference in differences

- Compute the change in HH composition from 1999 (prior to death) and 2002 (after death) for affected HHs
- Compute change in HH composition for nonaffected HHs (excluding those with either illness or death)
- Compute the difference between the two, to net out possible trends in time

$$\Delta X_a = X_{a,1999} - X_{a,2002}$$

$$\Delta X_n = X_{n,1999} - X_{n,2002}$$

$$DID = (\Delta X_a - \Delta X_n)$$

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Table X. Difference-in-Differences in Household Composition 1999-2002, by Gender of Deceased Prime-age Adults

Household Composition	Male PA death $\Delta XM - \Delta XO$		Female PA death $\Delta XF - \Delta XO$	
	Number	<i>t-stat</i>	Number	<i>t-stat</i>
Household Size	-1.11	-11.26	-1.34	-9.36
Male adults	-0.99	-21.43	0.01	0.18
Female adults	-0.01	-0.11	-0.92	-14.25
Boys	0.00	-0.07	-0.06	-0.77
Girls	-0.21	-3.43	-0.20	-2.82
Young Children	0.05	0.57	-0.14	-1.71
PA adults	-0.98	-12.70	-0.81	-9.90
Elderly adults	-0.02	-0.30	-0.09	-1.39
Household Size (AE)	-1.04	-17.31	-0.87	-9.01
Dependency ratio	0.54	5.12	0.23	1.71

Source: TIA 2002. Authors estimations.

ΔXM = Change HHs w/male death ; ΔXF = Change HHs w/female death;
 ΔXO =Change Other HHs

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Demographic changes: Compared to nonaffected HHs

- For all HH with a death:
 - Significant change in HH size and in adult equivalents (reduction rather than growth)
 - Loss of an adult, not fully recovered
 - Decline in young girls (rather than growth in number of young girls)

- Cases of male death vs female death:
 - Loss of adult male not recovered, but loss of adult female partially recovered
 - Loss of adult males resulting in significantly higher dependency rate; with adult female death, relationship less strong

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Summary on Demographics and Demographic Changes

- Affected HHs are generally not more likely to be poor in income or land than non-affected HHs
 - Some categories of HHs may have more difficulties than others
 - HHs with male death and few remaining adults
- Some HHs show signs of probable labor constraints
 - Higher dependency rates
 - Increase in households with only 1 adult present
- Other HHs show signs of dealing with labor loss partially through bringing in new members
 - Particularly true in cases of female death

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Strategies to Mitigate the Effects of a Prime-Age Death on Agricultural Activities

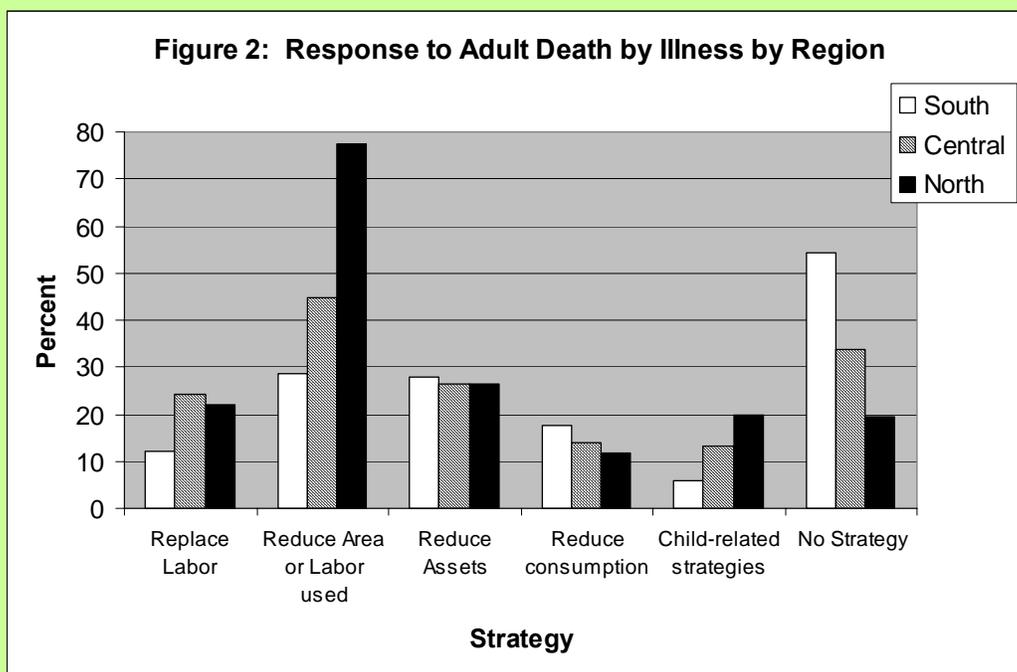
- Open-ended question to respondent: maximum of three responses allowed in reference to each deceased individual
- Actual Question: “Identify the 3 most important strategies undertaken by your household in order to minimize the effects of the death (departure) of this person on your agricultural and livestock activities”

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Strategies

- Post-coded adjustment strategy groups:
 - Labor replacement
 - Hire labor, work more, children in field
 - Reduce area cultivated or labor used
 - Less land cultivated, less weeding
 - Asset reduction
 - Sell livestock, other assets
 - Child-related strategies (may be underestimated)
 - Take children from school, send away
 - Consumption reduction strategies
 - Poorer quality diet, fewer meals
 - No strategy identified

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Figure 3: Response to Departure, Illness, and Death by Illness of a Prime-Age Adult

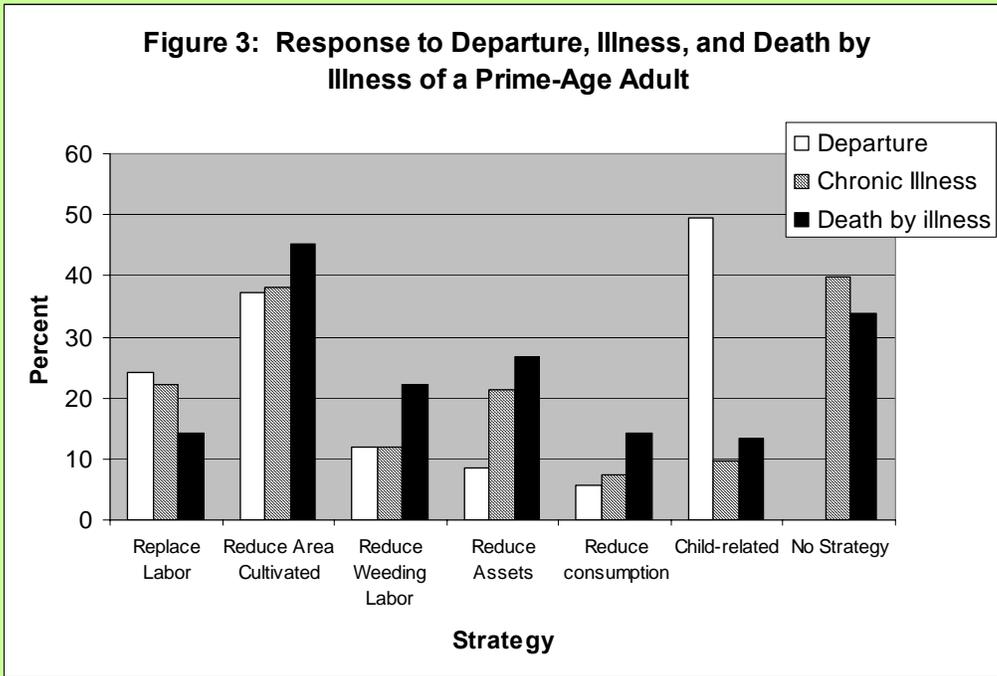


Figure 4: Strategies in Response to Prime-Age Adult Death From Illness, by Gender of Deceased

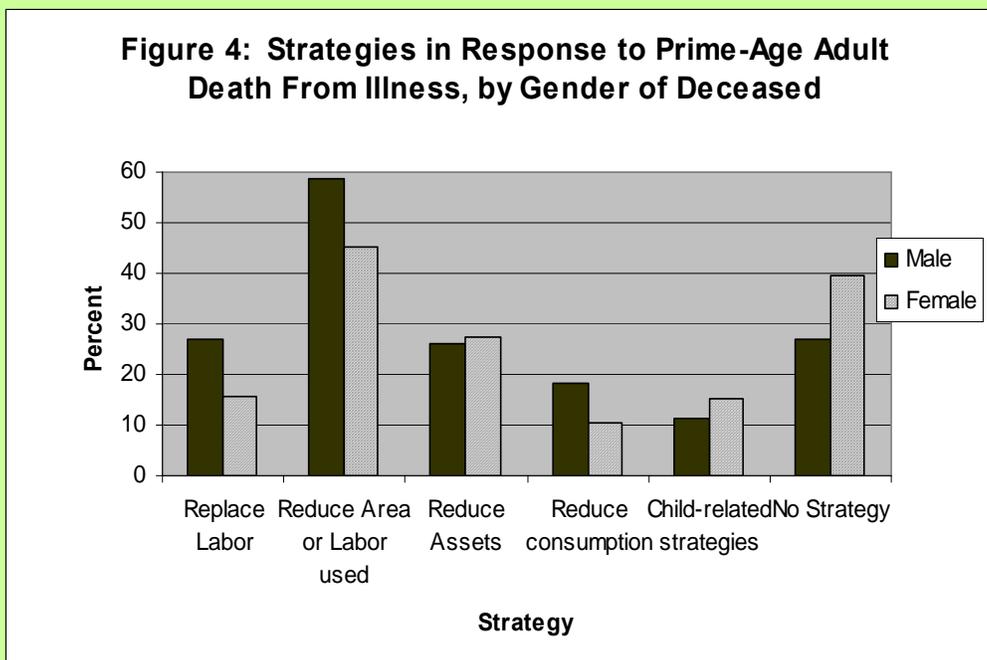
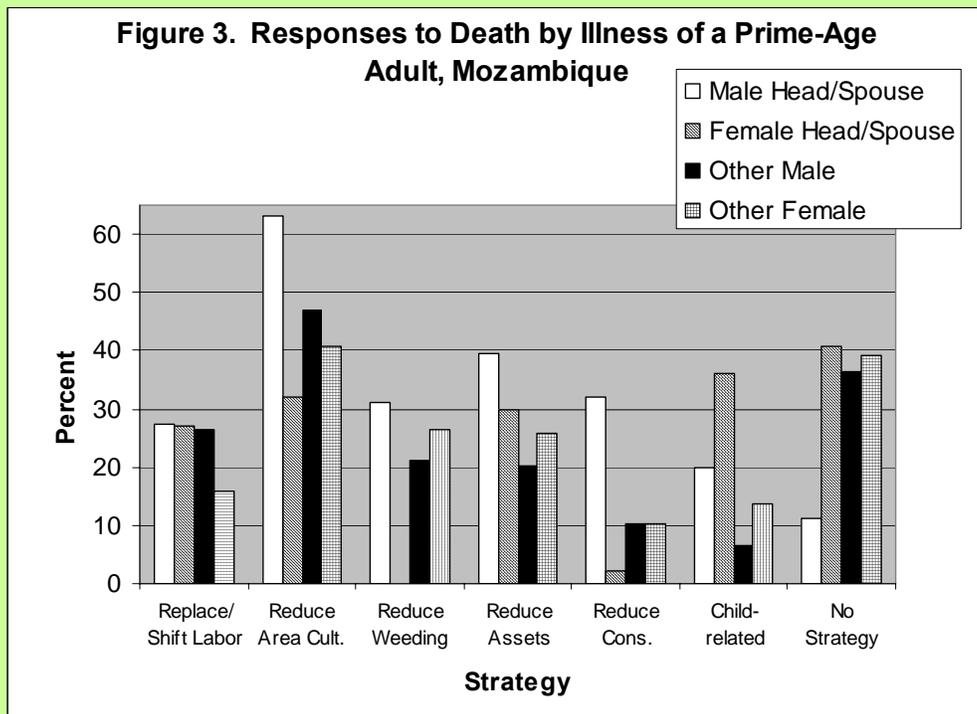


Figure 3. Responses to Death by Illness of a Prime-Age Adult, Mozambique



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Who is Adopting Which Strategies and What is Associated With This?

- 1-Hire labor or increase use of mutual help (Annex Tables 7 & 8)
 - This strategy more likely with male death than female death (**)
 - Compared to those who don't use strategy, users have higher income per capita, higher land/AE, more AE's, and larger decline in HH AE's
- 2-Increased use of child labor
 - More likely with death of HH head/spouse (*)
 - Users have lower income per capita, more total land/AE, and larger decline in AE

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Who is Adopting Which Strategies and What is Associated With This?

- 3-Reduce area cultivated--most common strategy but still only 44 % of cases
 - More likely with male death, particularly male head/spouse (**)
 - Users have lower income per capita, lower AE's (*)
- 4-Reduce labor spent on weeding
 - More likely with death of male head/spouse compared to female head/spouse (*)
 - Users have lower income per capita, lower AE (*); higher land/AE

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Who is Adopting Which Strategies and What is Associated With This?

- 5-Reduction of cash, livestock, or other assets
 - More likely with female death (*) or death of head/spouse (*)
 - Users have slightly higher income
- 6-Send children away
 - More likely with female death (*), especially death of a head/spouse (**)
 - Users have higher income, lower land/AE, lower AE's
- 7-No strategy declared
 - Very unlikely with death of male head/spouse (**)
 - More likely that no strategy was declared by HH with death of other member (**) or female (*)

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Table 8. Probit Estimates of Marginal Effect on Reported Use of Strategy “Reduction in Area Cultivated” by Households with a Prime-Age Adult Death due to Illness

Factors	Use of Strategy “Reduction in Area Cultivated” (Yes=1, No=0)	Mean Value
Constant	-0.312*** (-3.30)	
Central Region	0.172* (1.73)	0.438
North Region	0.535*** (4.83)	0.207
2002 HH Total Area /Adult Equivalents (AE)	0.013 (0.43)	0.635
2002 HH Total Income / AE	-0.000 (-1.01)	2198
% change in HH Adult Equivalents 1999-2002	0.449** (2.40)	0.168
Deceased was Male Head/Spouse	0.238** (2.20)	0.138
Death occurred in 1999 or 2000	0.089 (1.17)	0.406
Principal access road to village is paved	- 0.197** (-2.14)	0.245
Factory in village	0.383** (2.26)	0.057
Hammer Mill in this village or adjoining village	-0.124 (-1.47)	0.471
Principal village water source is outside of village	-0.061 (-0.64)	0.183
Ln(Agricultural Population Density) ^a	-0.112 (-1.15)	0.182
^a (# prime-age adults in village / total village area cultivated) *** significant at the 0.01 level ** significant at the 0.05 level * significant at the 0.10 level Coefficients calculated as dF / dX (z stat in parentheses)		N = 212 LR chi2(12) = 49.5 prob > chi2 = 0.0000 Log Likelihood= -118.0 Psueudo R2 = 0.173

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Implications For Ministry of Agriculture for Policy and Programs?

- Inclusion of demographic/death enquiry section in TIA 2002 provides estimates of rural mortality rates and enables analysis of affects on households and their responses, even if not perfect

Conclusions

- Affected households in many cases look like other Mozambican households; only some affected hhs are ex post in the poorest category
 - PA male head/spouse death, with nuclear family, leaving just 1 PA adult female to support hh
- HHs most likely to need assistance may be most unlikely to adopt new agricultural technology
- Greatest time savers (especially for women) may be interventions in water, fuel search and food processing/preparation
- Animal traction, weed control and other technologies may help increase agricultural productivity may be good, but the justification is not based on HIV/AIDS

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Conclusions (cont.)

- Heterogeneity of strategies indicated suggests that simple economic logic fails to capture all the dynamics occurring in these households
 - Intra-household labor allocation important
 - Capacity to bring in new members or hire labor makes a difference
- Poverty is widespread in Mozambique – need to evaluate interventions based on a broader set of criteria than just HIV/AIDS
- The rural area hardest hit by HIV/AIDS is the South, where agriculture is secondary to other activities and has the lowest potential

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Conclusions (cont.)

- Strategies of hhs will depend on various factors:
 - HH demography both before and after death
 - HH assets/resources and income sources
 - Intra-household allocation of labor
 - Extent to which other hhs in community, extended family are directly hit by HIV/AIDS
 - Strength of social networks in rural communities
 - Extent of HIV in rural areas
- Thus, interventions cannot be designed based solely on research in other contexts
 - Time Use Studies particularly important, as well as demographics

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**Thank
you**



**Muito
Obrigado**

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Implications For Policy & Programs

- Heterogeneity of spatial and socioeconomic characteristics of affected households & individuals
 - Provincial and/or regional differences in mortality rates suggest need for geographical targeting
 - Preponderance of PA deaths among non-HH heads/spouses implies some targeting emphasis on young adults if rates of increase in prevalence are to decrease
 - Wide levels of income and literacy among affected individuals requires appropriate and targeted education materials/strategies.

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Implications For Policy & Programs - III

- Households with adult death shocks suffer loss of labor, assets, and knowledge
 - Some affected households are reducing area cultivated and/or reducing labor inputs (weeding) which will likely reduce productivity
 - No signs of large shifts in cultivation to labor-saving crops, etc.

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Technological Policy & Development

- Heterogeneity in adjustment strategy responses by characteristics of affected households and deceased members
 - This suggests caution in diversion of agricultural/livestock research funds to just labor-saving crop and input technologies
 - The loss of family labor due to a death in the household does not mean that ag. labor necessarily becomes the household's principal production constraint – some HH's are able to replace ag. labor
 - In addition, not all affected HHs reduce area cultivated – less than half HH's indicate reduction in cultivated area or labor applied as an adjustment strategy

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Technological Policy & Development

- Labor-saving innovations and investments that would reduce labor demands on women's HH activities (gathering cooking fuel / water, food processing) would likely be more beneficial for the majority of affected households than labor-saving crop/input technologies
 - In addition, these innovations would benefit ALL rural HHs -- especially the poorest -- not just the affected
- MADER must work to preserve balanced attention to non-affected as well as affected households
 - The principal problem for the rural economy is that rural incomes of non-affected HH's remains very low, especially in lower income quartiles
 - agriculture research and extension funds are scarce; overall productivity growth is needed for all rural households

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Implications For MADER: Land, Food and Other Policy & Assistance to Affected HHs

- Households with a female death seem to be better able to replace labor than those with a male death
 - Some focus on households with a male illness or death
 - Consider home-based care and assistance for ill people combined with health care training for potential care givers
 - However, it is essential to target food assistance to reach the most vulnerable yet avoid market disincentive for non-affected households
- Households with a male death are more likely to reduce area cultivated
 - Critical to secure land rights for widows and/or her children so that HH assets are not further reduced and to allow secure land rental as an income strategy
- Consider using nutrition supplements and ARVs to keep people active as long as possible