

# Measuring the Effects of Prime-Age Mortality on Rural Households: Kenya, Mozambique, Rwanda, and Zambia

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USAID Annual Review, MSU  
March 10, 2004

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## Current Understanding of HIV/AIDS' Effects on Rural Households

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- Macro-level studies: highly variable findings
  - Sachs: 35% decline in GDPs in highly infected countries
  - Others: less than 1/2% decline in annual GDP growth
- Micro-level studies: few representative and quantitative
  - Growing number of studies in AIDS “hot spots”
  - Little attention to counterfactuals
- Empirical understanding of how rural HHs respond to AIDS remains very weak

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# Objectives

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1. To demonstrate complementary method to investigate the effects of prime-age mortality on rural households
2. To determine the characteristics of afflicted individuals and affected households
3. To measure the effects of adult mortality on households
4. To identify implications for design of agricultural programs and policies

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# Methods

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- Add demographic and mortality component to on ongoing nationally representative HH surveys
- Ask HHs about individuals who died over past 3-4 years; cause of death (illness), symptoms, etc.
  - Use death of prime-age adult (age 15-49) by illness as rough proxy of HIV/AIDS death
  - Compare Affected households with Non-Affected (control group)
- Using cross-sectional data, longitudinal data where possible
- Undertaken with agricultural sector funding

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# Countries studied

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- Kenya (1997 and 2000)
- Rwanda (2001, 2002)
- Zambia (2001)
- Mozambique (2002)
- Malawi (1991, 2001)\*

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# Support for Method Used: Relationship between HIV/AIDS and Adult Mortality

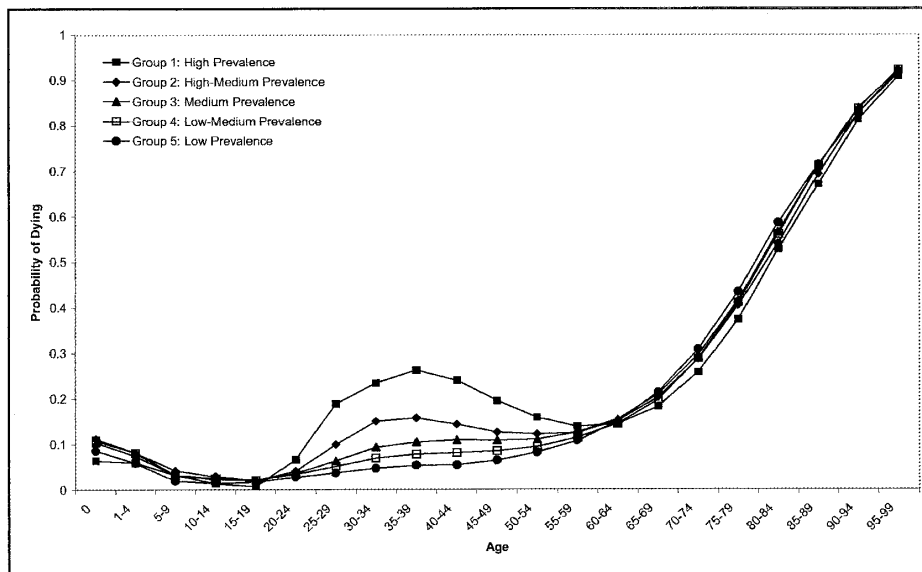
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- Strong Correlation between HIV Prevalence and Adult Mortality Rates
  - Across Sub-Saharan Africa countries
  - Within countries, across provinces
- Similar individual characteristics for HIV positive and deceased adults
  - Females: 25-35; Males 35-45

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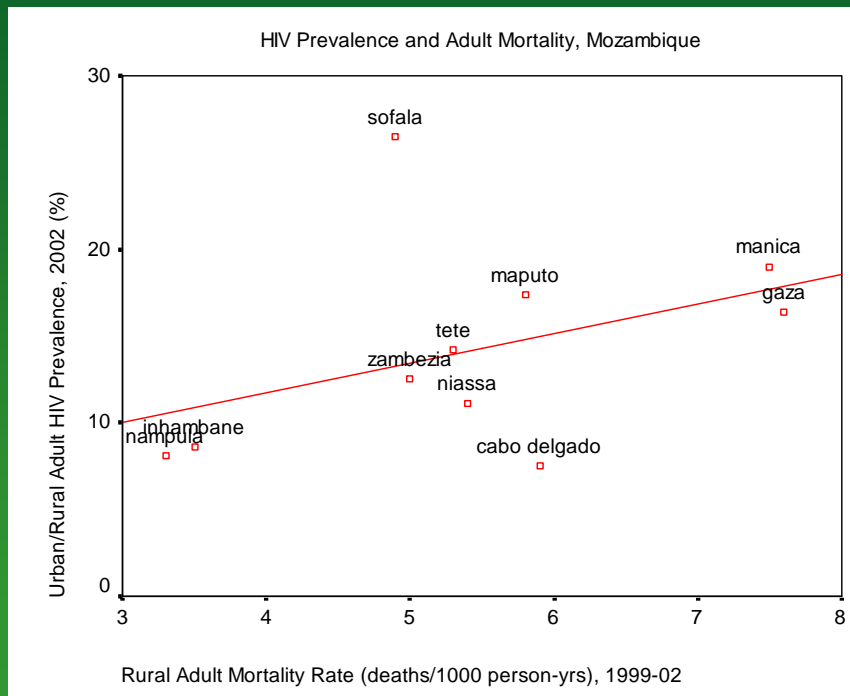
# Figure 1. Illustration of Effects of HIV/AIDS on Male Prime-Age Death

Median UN Projected Male Age-Specific Probability of Dying 2000-2005 by HIV Prevalence Group for 35 Countries in Africa with HIV Prevalence Estimates of 1.0 percent or Greater. (source: UN AIDS Wall Chart, accessed July, 2003, UN Population Prospects 2002 Revision, and the UNAIDS 'Barcelona Report' Report on the Global HIV/AIDS Epidemic, 2002)



Source: Ngom & Clark. Adult Mortality in the Era of HIV/AIDS: Sub-Saharan Africa  
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# Relationship Between Urban/Rural HIV Prevalence and Rural Adult Mortality Rates, Mozambique



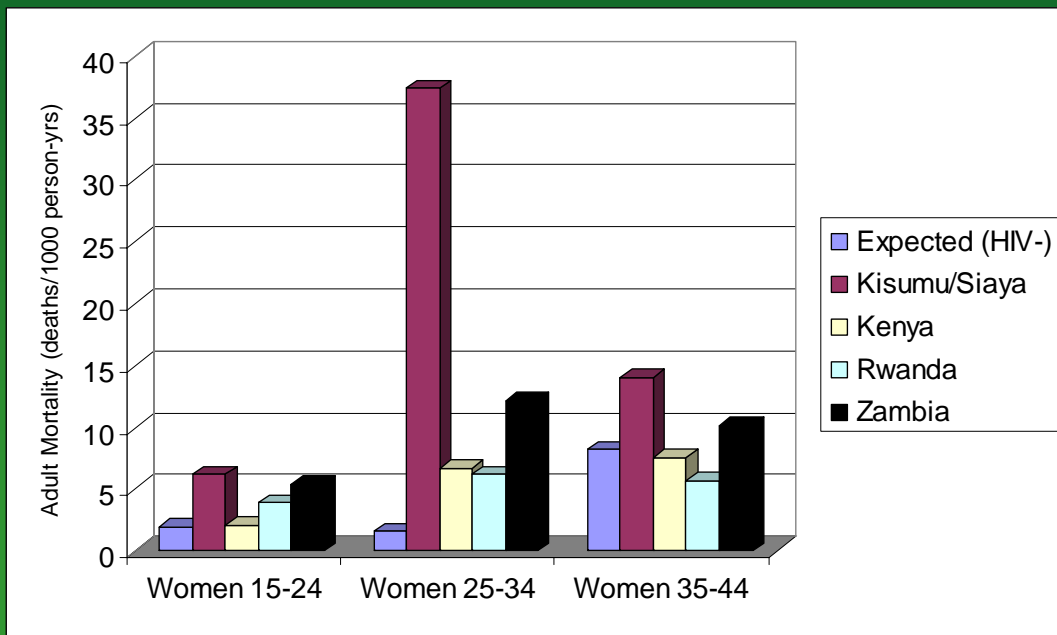
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# Relationship between HIV Prevalence and Adult Mortality Rates

- Strong positive correlation between Provincial Adult HIV prevalence and Adult Mortality Rates
  - Spearman rank correlations for the 4 countries:
    - Range from +0.30 to +0.67
    - All are +0.50 and higher when excluding one “urban” outlier (Rwanda, Moz)

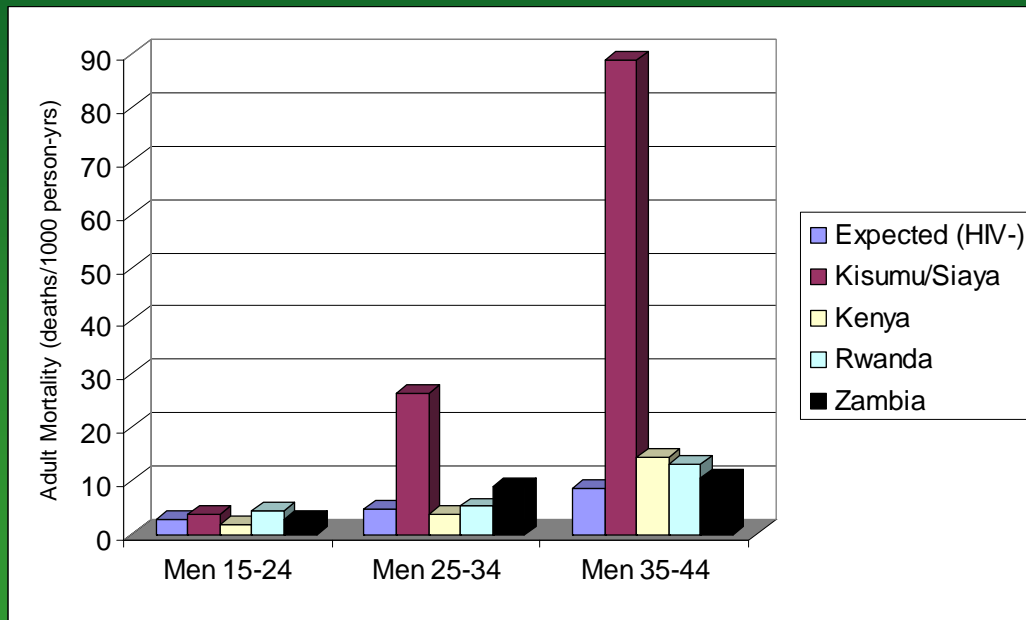
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## Rural Adult Mortality Rates – Women expected (based on HIV- rates) vs. actual



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## Rural Adult Mortality Rates – Men expected (based on HIV- rates) vs. actual



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## Characteristics of Deceased Individuals

- Conventional Wisdom (CW) on afflicted adults:
  - Household head/spouse
  - Higher education
- Findings (Moz, Zambia):
  - Non-afflicted: 2/3rds head/spouse (1/3rd "other")
  - Deceased: 1/3rd head/spouse (2/3rds "other")
- Range of education levels among deceased
- IMPLICATIONS:
  - Informative for HIV Prevention program targeting?
  - Dependency Ratios, Agricultural Production

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## Ex Post Characteristics of Affected HHs

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- CW: Affected HHs typically forced into poverty and lose land access
- Finding: On average, not predominantly poorer (income or land per capita)
- IMPLICATION: questions efficacy of targeting interventions to “AIDS-affected” households
  - food aid, vouchers, cash, school grants, etc

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## Effect on Household Composition and Labor Availability

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- CW: Affected HHs face severe labor shortages and higher dependency ratios
- Findings: Some affected HHs reduce labor used
  - 57% in Rwanda
- Yet Loss of Adult Labor not always 100%
  - more likely bring in new members (especially when female has died)
- Affected HHs do not necessarily have less available adult labor *ex post*
- Dependency Ratios not higher on average

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## Effect on Area Cultivated & Cropping

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- CW: Affected HHs reduce area cultivated and/or relative area in higher-value crops
- Finding: Decline in area cultivated/cash crops for some affected HHs
  - Male head
  - poorer HHs
  - smaller HH size prior to death

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## CW: Focus on Labor-Saving Ag. Technologies?

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- Many afflicted households still have high labor/land ratios
- Adult mortality also depletes assets
- IMPLICATION: results question the potential demand for labor-saving ag technologies
  - Higher returns likely from other labor-saving technologies (hammermill, well, improved stoves)
  - Prioritizing labor-saving ag technology may forego potential productivity gains

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# Summary

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- Demonstrate validity and value of method
- Describe characteristics of afflicted individuals
  - Informative for HIV Prevention Programs
  - Conditions effects of mortality
- Describe *ex post* characteristics of affected HHs
  - Implications for targeting aid or technologies
- Measure effects of mortality on rural HHs
  - Adds empirical evidence to dialogue on appropriate mitigation responses

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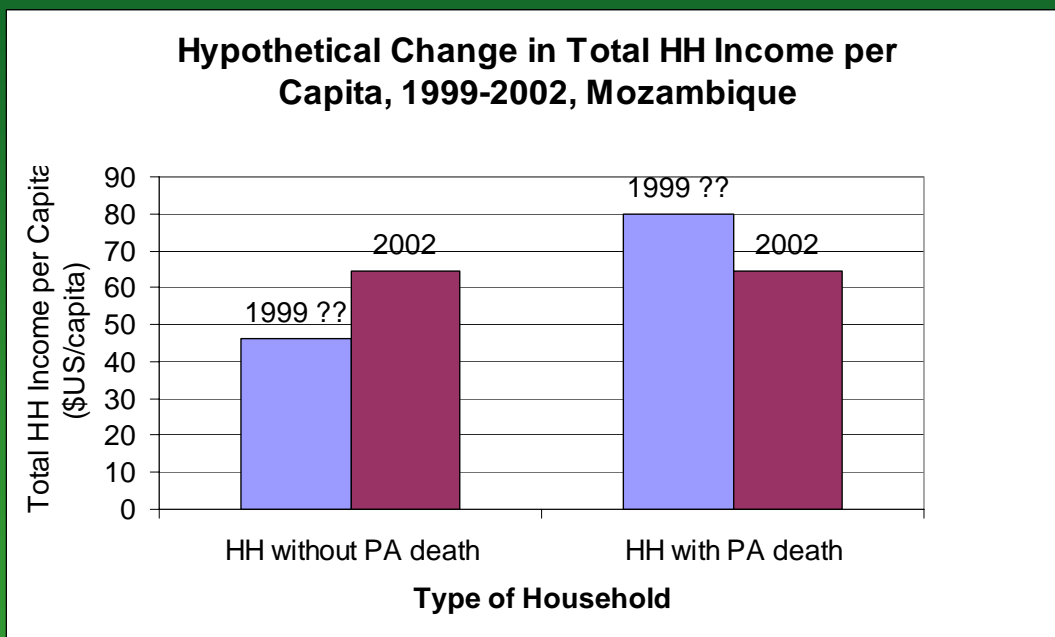
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# Measuring the Effect of Adult Mortality on Household Ag & Welfare Outcomes

- Representative Sample Survey data
  - Enables comparison of affected and non-affected HHs
- Panel data (Kenya 1997 + 2000)
  - Data on outcomes before AND after death - enables most accurate measurement of changes in outcomes
- Cross-sectional data (Mozambique, Rwanda, Zambia)
  - Data on outcomes after death only – enables comparison of ex post outcomes
  - Moz/Rwanda have recall data on “HH strategies” taken in response to adult death
  - Alternative econometric techniques exist to construct the counterfactual needed to estimate changes in outcomes

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## Example of Inference from Cross-sectional data: *Ex Post* HH Income/capita



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## Effect on Household Composition Depends on Who Dies (Kenya)

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- Head-of-household death → - 1.5 members
  - Major loss in adult labor, mostly older hh members leave
- Female head/spouse death → - 2.1 members
  - Young boys and girls leave the household
- Death of other adults → hh often gained new adult member; these hhs are less adversely affected

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## Summary - 1

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- Areas of high prime-age adult mortality coincide with areas of high HIV+ prevalence
- Characteristics of deceased adults (age, gender) similar to those in HIV seroprevalence surveys
- IMPLICATION: Using adult death from illness as a proxy for HIV/AIDS within representative HH surveys is a valuable research strategy
  - Especially when combined with other HH-level ag/income data

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## Summary - 2

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- Range of characteristics of deceased (education, household position) across and within countries
  - Kenya: primarily male heads and female daughters
  - Rwanda: similar to population distribution
  - Moz, Zambia: primarily non-head/spouse males and females
- IMPLICATION: Informative for HIV Prevention targeting

## Summary - 3

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- Effects on Household Composition

Resources are limited, so:

- **What is Appropriate Balance Between:**
  - Investing in Long-Term Productivity (e.g. education, ag. technology, market infrastructure)
- vs.
- Investing in Targeting assistance to AIDS-afflicted households and communities
- Synergies?

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## Characteristics of Deceased Individuals: Education Level

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- CW: Afflicted adults typically have high education
- Findings:
  - Deceased adults have slightly less education than non-afflicted (Kenya)
  - Range of education levels – ill/deceased are more likely to be illiterate than non-afflicted; but just as likely to have 6+ years education (Moz, Rwanda)
- IMPLICATIONS:
  - Informative for Design and Targeting of HIV Prevention programs?

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