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SOCIO-ECONOMIC CHARACTERISTICS OF INDIVIDUALS AFFECTED BY AIDS-RELATED PRIME-AGE MORTALITY IN ZAMBIA

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Major Findings:

- Single women are 2 to 5 times more likely to die of disease-related causes as women who are the heads or spouses of their households.
- Social factors driving the spread of AIDS are considerably more complex than simply poverty-based explanations, although poverty may certainly contribute to risky behavior and poor health which are important pathways by which the disease is spread.
- There is no clear relationship between educational attainment and probability of dying; both well educated and poorly educated men and women should continue to be targeted for HIV/AIDS behavior change campaigns.
- Prime-aged men and women experiencing a prior death in their household are 23.0 and 18.1 times more likely to die of disease-related causes than men and women in households with no prime-age deaths in the past 8 years. ARV therapy may be targeted especially to single-parents whose spouse has already died.

BACKGROUND: Campaigns to prevent the spread of HIV/AIDS require accurate knowledge of the characteristics of those most likely to contract the disease. Studies conducted in Sub-Saharan Africa during the 1980s generally found a positive correlation between socioeconomic characteristics such as education, income, and wealth and subsequent contraction of HIV (see Ainsworth and Semali, 1998).

As the disease has progressed, however, the relationship between socioeconomic status and HIV contraction may have changed in many areas of Sub Saharan Africa, although there is little hard evidence to support this. For example, it is increasingly believed that poverty forces some individuals to adopt

risky behaviors that contribute to HIV infection, which could mean that AIDS-related mortality is disproportionately affecting relatively poor households.

OBJECTIVES: This study is designed to help policy-makers and development agencies in the formulation of AIDS prevention and mitigation strategies. The study determines the *ex ante* socioeconomic characteristics of individuals who die between the ages of 15 to 59 years of age (hereafter called “prime age” mortality), using nationally representative panel data of individuals surveyed in rural Zambia between 2001 and 2004.

METHODS AND DATA: The study uses nationally representative longitudinal data on 18,821 prime-age individuals (15-59 years of age) in 6,922 households in 394 standard enumeration

areas in Zambia surveyed in May 2001 and May 2004 by the Central Statistical Office in conjunction with the Ministry of Agriculture and Cooperatives and Michigan State University's Food Security Research Project. See annex on page 4 for more details on methods and data.

SUMMARY OF FINDINGS: The study highlights several findings:

First, we find a strong correlation (0.84) between provincial-level prime-age mortality in our data and HIV-prevalence at nearby sentinel survey sites as reported by the Zambia Demographic Health Survey, supporting other findings that the rising number of disease-related mortality in rural Zambia is indeed related to AIDS.

Second, within the three-year period between May 2001 and May 2004, the probabilities of disease-related death for prime-aged women and men were 1.1% and 0.6%, respectively.

Third, 61% of the prime-age deaths observed in this nationally-representative rural sample between 2001 and 2004 were women. These results are also consistent with emerging evidence that a higher proportion of women are dying of AIDS than men in Southern Africa (UNAIDS 2003).

Fourth, the marginal probability of dying from disease rises steeply from age 15, peaking between ages 30 and 39 for females, and 45-59 for males. This finding confirms previous findings showing that females are more likely to die at an earlier age than their male counterparts.

Fifth, somewhat consistent with findings in the 1980s and early 1990s, relatively wealthy men are more likely to die of disease-related causes than men from poor households. Although poverty might be expected to raise the probability of infection of sexually transmitted diseases and HIV, our findings indicate that the influence of high economic and social status tends to predominate for men.

Sixth, women in relatively poor and wealthy

households are equally likely to die of disease-related causes, with the probability of mortality over the 3-year period being roughly 1.1% regardless of their households' income or asset levels.

Seventh, among relatively poor women, those having some form of formal or informal business income are 15% less likely to die of disease-related causes than those without any form of business income. This finding suggests that efforts to provide greater income-earning opportunities for poor women may make at least a modest contribution to reducing female prime-age mortality. However, women in relatively non-poor households with business income were 7% more likely to die than those without any business income. This finding, coupled with the finding that poor and non-poor women are equally likely to die of disease-related causes calls into question the view that poverty leading to risky behavior is the major pathway through which the disease is spread, although this may certainly be one of many pathways.

Eighth, prime-age female mortality is occurring predominantly among single women in the younger age groups. Single women are 2 to 5 times more likely to die of disease-related causes as women who are the heads or spouses of their households. These results are consistent with the findings of a five-country study by Mather et al. (2004).

Ninth, men and women living 2 or more months away from home per year are 2 to 10 times more likely to die than men and women living at home throughout the year.

Tenth, educational attainment was found to be largely unrelated to vulnerability to death for both men and women. There is some limited evidence of a negative relationship between educational attainment and the probability of disease-related death for relatively non-poor women. One apparent implication of this finding is that both well educated and poorly educated men and women should continue to be targeted for HIV/AIDS education and behavior change campaigns.

Eleventh, the prior death of at least one adult in the household is the single most important factor

influencing the probability that a prime-aged individual will die. Irrespective of their poverty status, prime-aged men and women experiencing a prior death in their household are 23.0 and 18.1 times more likely to die of disease-related causes than men and women in households with no prime-age deaths in the past 8 years. In this way, AIDS differs from other kinds of diseases (e.g., malaria), which does not appreciably raise the likelihood of subsequent death in the family after one member contracts the disease.

CONCLUSIONS: An emerging strand of the social science literature on HIV/AIDS in Africa stresses the relationship between poverty, risky sexual behavior, and subsequent contraction of the disease. It has been argued that single women unable to sustain themselves through wage labor or agriculture are more likely to resort to transactional sex for survival. If this is an important social pathway contributing to the spread of the disease in Africa, then we might expect to find a relationship over time between household- and individual-level indicators of poverty, especially for single women, and subsequent chronic illness and death.

We find that relatively poor women who have some form of formal/informal business income are less likely to die of disease-related causes than women with similar characteristics having no formal/informal business activity. This finding suggests that efforts to provide greater income-earning opportunities for poor women may make at least a modest contribution to reducing female prime-age mortality. This relationship does not hold, however, for relatively non-poor females. Overall, 47.2% (45.0%) of the women dying of disease-related causes over the three year survey period came from households in the top half of the asset (income) distribution.

These findings suggest that the social factors driving the spread of AIDS are considerably more complex than simply poverty-based explanations, although poverty may certainly contribute to risky behavior and poor health which are important pathways by which the

disease is spread.

The findings of the study can help policy makers and development agencies better understand current transmission pathways of HIV/AIDS, which should help in the formulation of up-to-date AIDS prevention and mitigation strategies. For example, because there appears to be no clear relationship between educational attainment and probability of dying, this suggests that both well educated and poorly educated men and women should continue to be targeted for HIV/AIDS education and behavior change campaigns.

Also, because 14.7% of the households incurring a prime-age death between 2001 and 2004 lost two or more adult members, AIDS differs from other kinds of diseases (e.g., malaria), which does not appreciably raise the likelihood of subsequent death in the family after one member contracts the disease. To the extent that the death of two prime-age members from the same household within a few years of each other causes extreme hardships on remaining members, especially for children, the implication of this finding is that special programs to target and support AIDS-afflicted households and orphans are likely to become an important component of poverty reduction strategies, especially in areas hard-hit by AIDS such as most of eastern and southern Africa. If resources for ARV therapy remain highly constrained in the foreseeable future, ARV therapy may be prioritized for single parents in households where the spouse has already died. This option may help to reduce the strains on communities caused by double-orphans and help nuclear families remain intact as best as possible.

A few caveats of this study are in order. Given the long period between infection with HIV and the transition to full-blown AIDS and death, these findings reflect patterns of infection 4-8 years ago. It is critical to continue assessing the factors associated with AIDS-related mortality to understand how they may be shifting over time.

*This *Policy Synthesis* is a condensed from a working paper by the same name. The full working paper in PDF form may be downloaded from: <http://www.aec.msu.edu/agecon/fs2/zambia/index.htm>

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Technical notes on data and methods

After accounting for attrition in the sample caused by enumerators not having re-visited several areas in 2004 that were included in the 2001 survey, the re-interview rate was 88.7%, and was 94.5% after excluding attrition caused by adult household members being away from home during the enumeration period and those

refusing to be interviewed. Household dissolution thus appears to have affected roughly 5.5% of the original 2001 sample.

To test for potential attrition bias, we examined the characteristics of individuals in households that were not re-interviewed in 2004 but contained in the 2001 survey. Households not re-interviewed were found to differ statistically in their 2001 attributes from the full sample in several respects. Attriting households had smaller household sizes, younger household heads, fewer assets and less land. This is believed to be at least partially because families near the beginning of their household life-cycle are more likely to be mobile and re-locate. It is also possible that poorer households are more likely to dissolve, although little evidence of this exists in the literature. Because of differences between attriting and re-interviewed households, we use the inverse probability weighting method in model estimations.

Excluded from the analysis are 211 prime-age individuals who joined the household after the 2001 survey and died between 2001 and 2004. Strictly speaking, the relevant sample is composed of prime-aged adults who were residents of sampled households in 2001. Including individuals joining sampled households later might overestimate the prevalence of prime-aged mortality. Other studies have found that a high proportion of HIV-positive individuals returned to their rural families to receive terminal care after becoming ill (e.g., Kitange et al., 1996). After excluding these cases, 6.3% of households in the panel survey had at least one disease-related PA death over the three-year period.

Probit models are estimated of disease-related mortality of prime-age individuals in rural Zambia between May 2001 and May 2004. The results of these models are used to report the probabilities of mortality over a three-year period for a range of individual profiles that differ according to their gender, level of income, education, months residing away from home, distance to district town, and other initial individual, household, and community characteristics.

We tested for potential regional differences in factors associated with prime-age adult mortality, but we found very limited evidence of this through specification tests, thus our models use the national sample stratified by gender and income status. We run these models separately for prime-aged men and women, and for individuals in the top vs. bottom half of the 2001 income and assets distribution.