Community Context and HIV Prevalence among Women and Men in Zimbabwe

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The prevalence of human immunodeficiency virus (HIV) in sub-Saharan Africa varies widely, with the highest rates in the Southern Africa region. A recent report using nationally representative Demographic and Health Survey data from 22 countries demonstrates that in most countries, the prevalence is higher among women than among men, and in all but two countries, the prevalence is higher in urban than rural areas (Mishra et al., 2009). To date, most studies that examine factors associated with risk of HIV in sub-Saharan Africa focus on individual-level socio-demographic and behavioral correlates of risk. These studies have demonstrated that women and men who are more educated; of higher socio-economic status (as measured through household assets); married, widowed or divorced; and work in the professional and manual/domestic sectors have a higher prevalence of HIV than their counterparts without these demographic characteristics (Mishra et al., 2009).   Notably, in Zimbabwe, the country where this study takes place, the prevalence by education level varies little for women; however, men with no education have a higher prevalence of HIV than men with primary or secondary education. Individual-level behavioral factors found to be associated with HIV risk include early sexual debut, multiple partnerships, condom non-use, sex in exchange for money or goods, and experience with intimate partner violence (Mishra et al., 2009; Dunkle et al., 2004). In addition, married women are exposed to the risk of HIV through their husband's sexual behaviors (Lewis et al., 2005), indicating the importance of examining the broader context of sexual risk-taking rather than solely examining an individual woman's own behaviors.

Only recently has HIV research and programmatic attention turned to considering the context within which individuals live. For example, the higher prevalence of HIV in urban areas may reflect the fact that individuals living in urban areas have greater access to education and health services, greater mobility, and are living in an environment where there are less strict controls over sexuality. Furthermore, the community context within which one lives also often determines traditional sexual practices, including acceptability of extramarital sex (for men and women); the practice of dry sex; female and male circumcision; and other norms and practices that could influence HIV risk (Sambisa, Curtis, and Stokes, in press). Programs that use a community-based approach for HIV prevention may be more effective, efficient and successful, particularly since individually-focused interventions that ignore the context of risk behavior may not result in sustained behavior change (Heise, 1998).

This study uses recently collected data from the 2005-6 Zimbabwe Demographic and Health Survey (DHS) and applies statistical and spatial analysis methods to examine the correlation between the prevalence of HIV risk-taking behaviors at the community level and the prevalence of HIV at the community level. The focus of the analysis is on three community-level factors: a) the prevalence of premarital sex in a community, b) the prevalence of non-marital sex, and c) the prevalence of intimate partner violence in the community. The remaining risk behaviors, condom non-use and sex in exchange for money or goods are not included in this community-level analysis as there is limited information on

these variables since only those engaged in high-risk sex were asked these questions; engagement in high-risk sex is already captured through the prevalence of non-marital partners.

For this study, the community is defined as the primary sampling unit (PSU) used in the Zimbabwe DHS. The DHS uses a multi-stage sampling design, first randomly selecting PSU and then within sampled PSU, about 20-30 households are randomly selected for data collection. In selected households, all women ages 15-49 and all men ages 15-59 were eligible for interview. For this study, only PSUs that included at least 10 women interviewed were included in the analysis sample. Because this analysis is performed at the community (PSU) level, all study variables were collapsed and weighted to represent the community with the available observations (e.g., the all women HIV variable is based on all women in the community's HIV test results). Only communities with at least five or more women (or men) who were HIV tested had an HIV prevalence measure calculated; this selection was made because this is the key outcome variable and not all women (and men) agreed to be tested. The two PSUs that ended up with missing values for HIV prevalence had their values interpolated from nearby PSUs using an inverse distance weighting procedure.

To examine the role of community-level behaviors on community-level HIV prevalence, the analyses are performed by specifying multivariate regression models and using generalized linear estimation procedures when required due to dependence structure among model residuals. . In Model 1, the female prevalence of HIV is regressed on the prevalence of premarital sex among women, the prevalence of women having non-marital partners, the prevalence of physical IPV, the percentage of women in union, the percentage of women with secondary education, and whether the community is urban. Model 2 incorporates the prevalence of men having non-marital partners and Model 3 adds male HIV prevalence. All models are also run stratified by location of residence: urban or rural.

In Zimbabwe, the female prevalence of HIV at the community level ranges from zero to 60% with a mean prevalence of 21.4% (median is 20%). At the community level, the prevalence of women reporting premarital sexual experience ranges from 0% to 90% with a mean value of 30.6% (median is 27%).[1] The community-level prevalence of women having non-marital last sex partners ranges from 0% to 86% with a mean value of 11.6% (median is 9%) and the community-level prevalence of men having non-marital partners ranges from 0 to 86% with a mean value of 27% (median is 25%). Finally the prevalence of HIV among men ranges from zero to 55% with a mean of 14% (median is 12.5%).

Multivariate results examining the correlates of the female prevalence of HIV (see Table 1) demonstrate that communities with high prevalence of premarital sex have a higher prevalence of HIV. In addition, there is a marginal effect of the prevalence of extra-marital sex (among women) on the prevalence of HIV. The effect of secondary education is the opposite; higher prevalence of secondary education is

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[1] Notably, the prevalence of premarital sex is estimated from the available data on age at first sex and age at marriage. In the DHS, age at first sex is provided as a whole number with an additional option for "within marriage." The age at marriage information is available in age format as well as month and year. To determine whether first sex was in union, the two age variables are compared. Where there is error (e.g., age at first sex was at age 17 but marriage happened at age 17 ½), this would be miscoded as marital first sex. The error in the categorization was to categorize first sex as being marital, a more conservative approach.

associated with a lower prevalence of HIV. When models are stratified by urban and rural residence, distinctions are found. Among women from urban areas the factors associated with a higher prevalence of HIV include the prevalence of premarital sex and IPV prevalence (with p<.10). In addition, the prevalence of secondary education remains significant and protective. In rural areas, the two significant factors are premarital sex prevalence and the prevalence of non-marital partnerships.

Models that add the prevalence of men having non-marital sex (Model 2) and the prevalence of male HIV (Model 3) are also enlightening. In particular, among all women, the prevalence of female premarital sex remains significant and positive. Women's non-marital partnerships are no longer significant; however, the prevalence of men's non-marital partnerships and the prevalence of HIV among men are key determinants of the prevalence of HIV among women. Models stratified by place of residence indicate that in urban areas the prevalence of premarital sex among women, and male HIV prevalence are key determinants of female HIV prevalence. In rural areas these same two factors are significant and positive as are the prevalence of non-marital partnerships among both women and men.

This study extends findings from individual-level models. Women living in communities where women and men engage in higher risk behaviors are at greater risk of HIV. In particular, the prevalence of premarital sex in a community is associated with higher HIV prevalence in both urban and rural areas. Furthermore, rural communities with a higher percentage of men who have non-marital partners and rural communities with a higher HIV prevalence among men are the communities with a higher female HIV prevalence. From these findings, we conclude that while changing individual-level risk behaviors including delayed sexual debut, partner reduction, and condom use are important for HIV prevention approaches that will lead to reduced HIV incidence over time, there is also a need to consider community-level risks. In particular, programs that target communities with higher non-marital sex and communities with greater premarital sex may need to address social norms that make these behaviors acceptable and thus increase all women (and men's) risk of HIV, not just those engaged in these high-risk behaviors.

References

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Table 1. Multivariate Regression Results for Community-Level Factors Associated with the Community-Level HIV Prevalence

Variable	Model 1			Model 2			Model 3		
	Full sample	Urban	Rural	Full sample	Urban	Rural	Full sample	Urban	Rural
% women in union	-0.03(.05)	0.12(.09)	-0.05(.06)	-0.00(.05)	0.15(.09)	-0.02(.06)	-0.02(.05)	0.13(.09)	-0.05(.05)
% with 2nd education	-0.23(.08)**	-0.24(.09)**	-0.11(.16)	-0.19(.08)*	-0.20(.10)*	-0.07(.16)	-0.15(.08)+	-0.17(.09)+	-0.11(.15)
% premarital sex	0.17(.04)***	0.16(.07)*	0.16(.04)***	0.15(.04)***	0.14(.08)+	0.13(.05)**	0.15(.04)***	0.16(.08)*	0.12(.04)**
% last partner non-marital	0.11(.06)+	0.02(.11)	0.19(.08)*	0.10(.06)	0.01(.11)	0.19(.08)*	0.05(.06)	-0.04(.11)	0.13(.07)+
% IPV experience	0.04(.04)	0.11(.06)+	0.01(.05)	0.04(.04)	0.13(.06)*	0.01(.05)	0.03(.04)	0.09(.06)	0.02(.04)
Urban	-0.00(.01)	na	na	-0.00(.01)	na	na	-0.01(.01)	na	na
% men non-marital last partner	---	---	---	0.08(.03)*	0.07(.07)	0.10(.04)*	0.08(.03)*	0.08(.07)	0.09(.04)*
HIV prevalence among men	---	---	---	---	---	---	0.35(.05)***	0.19(.09)*	0.40(.06)***

na- not applicable; n=398 PSU

+p≤.10;   *p≤.05;   **p ≤ .01;   ***p ≤ .001