Abstract

Socioeconomic Status, Women and HIV: Do the determinants of Female HIV vary by SES in Cameroon?

One of the most consistent findings in social epidemiology is an inverse relationship between indicators of SES and most types of illness. In most cases, the incidence of HIV follows this classic pattern, with the poor having the greatest risk of infection and eventual mortality. However, a growing body of research on HIV in SSA suggests an intriguing reversal of this pattern. Further review of this literature presents us with a paradox in which both low SES and high SES individuals (especially women) seem to present increased risks of HIV, but mechanisms of risk appear to be distinct for each group. Using the 2004 CDHS data, this paper will explore relationships between various indicators of SES and HIV, with the results of these initial analyses used to estimate a series logistic regression models designed to highlight the distinct causal pathways that put higher SES women at increased risk of HIV.

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It is probably no surprise that the greatest health challenge facing most of the developing world at this point in time is the HIV/AIDS epidemic. It is actually argued that "the HIV/AIDS catastrophe has been one of the defining features of the past quarter of the century (Fauci, 2008:289)." The brunt of the epidemic is felt most by the Sub-Saharan African (SSA) continent, where 70% of all AIDS cases reside (Buvé, 2002). Even within this region, however, the epidemic has affected the population unevenly, with particularly high rates of HIV infection among women and higher SES groups. Women make up 77% of all global AIDS cases (MachLachan et al., 2009) and it is estimated that there are about 14 infected women for every 10 infected men in SSA (UNAIDS, 2006). Similarly, individuals with higher levels of education, higher status occupations, and greater household wealth have higher levels of HIV infection in SSA.

One of the most consistent findings in social epidemiology is an inverse relationship between indicators of SES (wealth, income, education) and most types of illness. In most developed nations, and in some developing countries, the incidence of HIV follows this classic pattern, with the poor having the greatest risk of infection and eventual mortality. However, a growing body of research on HIV in SSA suggests an intriguing reversal of this pattern, particularly with respect to HIV among women. In the SSA case, the health benefits traditionally associated with improved economic status appear to be mitigated by distinctive socio-cultural norms and patterns of sexual behaviors among high SES men and women. In particular, high SES women tend to delay marriage and have more extensive sexual experiences prior to marriage, while their high

SES male partners are more likely to have multiple concurrent partners, which can increase the risk of HIV exposure among high SES women. A review of this complex research literature presents us with "a paradox in which both economic hardship and economic prosperity can result in increased risks of HIV for women" (MachLachan et al., 2009). However, the mechanisms underlying elevated HIV risks appear to be distinct for each group.

METHODS

Data

I use a sample of over 5,000 women from the 2004 Cameroon Demographic and Health Survey (DHS) to explore the relationships between various indicators of SES and HIV. The CDHS is a nationally representative survey involving residents aged 15 and older funded by USAID and national government of Cameroon. The CDHS uses a muliti-stage complex cluster sampling methodology of more than 10,462 households, with response rates well in excess of 90 percent. The DHS survey provides information on a variety of topics tailored to the specific interest of each host country, but the most important part is the inclusion of population-based HIV testing. The ability to link HIV testing with individual questions provides me the ability to carry out in-depth analysis of factors associated with HIV infection as well as makes the DHS data a reliable source for estimating national rates of HIV infection.

Measures

This study examines a core dependent variable (HIV status) and four main sets of independent variables: Socioeconomic status (SES), power in relationships, sexual

behavior of respondent, access to health care, and knowledge of HIV and prevention methods. Other variables examined include marital status and control variables for region, place of residence and age of respondent.

SES is a multidimensional concept that is divided into three sub categories to capture both the household-level SES (*wealth index; five point ordinal scale of household wealth created by DHS, ranging from 1 to 5, with higher levels indicating more family wealth*) and individual-level SES (educational attainment and occupational status) to reflect a woman's independent socioeconomic agency.

Power in relationships is a construct made of three main components: attitudes toward sexual decision making in the relationship, amount of household decision making, and attitude toward physical violence.

Female Sexual behavior is captured via three different clusters of variables: length of premarital sexual experience *(for women who are married, premarital sexual experience is measured as the number of years between first intercourse and first marriage. Women who have never married, premarital sexual activity is the difference between age at fist intercourse and current age)*, condom use (*ever used a condom, current condom use, used condom the last time had sex),* and female risky sexual behavior (*drank alcohol the last time had sex, early sexual exposure, married but had sex with person other than husband, years of premarital exposure, years of total sexual exposure, total number of sexual partners in that last 12 months, and an indicator variable for more than one partner in the last 12 months).*

Access to health care is a construct captured by three main components; access to Centre de Dépistage volontaire clinics (CPDV; voluntary counseling and testing centre),

visited a health facility in the last 12 months and access barriers to health clinics (*barriers*

to accessing health clinic include transportation, distance and knowledge of where to

go). Knowledge of HIV infection and prevention was measured by constructing a scale

for positive indicators (15 positive indicators) of HIV knowledge.

Marital status was captured by a couple of variables; marital status (*6 categories*),

age at first marriage, and indicator variables for formerly married and polygamous

marriages. Characteristics of respondent's place of residence was determined via two

variables; place of residence (urban versus rural) and indicator variables for the ten

regions and two largest urban areas.

Analyses

This research employs univariate analyses to describe the characteristics and

demographics of the female respondent in the CDHS. A bivariate analysis is also done to

look for patterns between my independent variables and HIV status as well as

relationships between my independent variables. The results of these bivariate analyses

will then used on the final and most important section of this research, which is

estimating and testing a series of logistic regression models stratified by female SES and

designed to elucidate how the determinants of HIV operate differently among women

from low, medium and high SES groups. The multivariate analyses are still under way,

but the bivariate analyses which have already been executed are presented in the next

section. The final paper I present at UAPS will give in more detail the final results of

models that link gender, SES and HIV in Cameroon.

PRELIMINARY RESULTS

Results from bivariate analyses indicate that 4.1% percent of Cameroonian women in the low wealth index, 7.6% in the medium wealth index, and 8.5% in the high wealth index tested positive for HIV in the 2004 DHS data. Similarly, 3.9 % of women with no education, 7% of women with primary education, 8.2% of women with secondary education, and 4.2% of women with higher education tested positive for HIV. As it concerns occupation, women in the manual/domestic and professional/white collar occupations had significantly higher rates (9.7% and 8% respectively) compared to women who were unemployed (5.8%) and women in the agricultural sector (5.7%). All of these results are consistent with other studies that have looked at SES and HIV in SSA in general and Cameroon in particular (Glynn et al., 2004; Reither & Mumah, 2009) Basically these results indicate a positive association between SES and HIV among women.

However, bivariate relationships between HIV status and other conventional predictors of health risks are even more surprising. The initial results suggest that women who had been to a CPDV (Centre de Dépistage volontaire; 14%) or visited a health facility in the last 12 months (7.9%) or reported zero barriers to accessing health care (8%) had the highest rates of HIV compared to women who had limited or no access to health care. Women who command more decision making power in their respective households have higher HIV rates ($M=2.6$ vs. $M=1.8$). In the same light, women who indicated that at one point in their lives they had used a condom had significantly higher HIV rates (9.7%) compared to women who had never used a condom (5.3%). In each case, it is unlikely that the various attributes of women (visiting health clinics, using

condoms, having decision-power) actually causes higher HIV risk. Instead, there is reason to believe that the unexpected positive associations reflect the impact of other conditions or characteristics that are related both to these measured attributes and HIV status.

A similar story can be told with regard to the apparent association between current relationship (or marital) status and HIV infection. In the case of Cameroon, there appears to be a stepwise increase in HIV rates as a woman's age at first marriage increased, with women who married at age twenty and over having the highest rates (10.9%). Additionally, while currently married women have relatively low HIV rates (suggesting a protective effect of marriage), Cameroonian women who were *formerly* married (e.g., currently separated, divorced or widowed) have much higher rates of HIV (18%) compared to women who never married (3.5%) and women who were currently married (4.8%). It would appear that loss of husband (or change in marital status) due to past HIV infections of married women and/or their partners' is a major driver of current patterns of female HIV status.

The bivariate analysis also shows some expected patterns, including the fact that women who have used riskier sexual practices have higher HIV rates. Risky behaviors that increased HIV risk for women were drinking alcohol during last sexual intercourse (9.1%), married but had sex with other person (10.9%) and having more than one sexual partner in the last 12 months (11%).

DISCUSSION

Overall, these preliminary bivariate results indicate that the relationship between women, their socioeconomic status and HIV is complex, and that cross-sectional

bivariate patterns can disguise deeper causal pathways. Some of the factors that seem to put women at risk such as risky sexual practices make logical sense. Other surprising results are likely indicators of 'reverse causality' – e.g., where women who have already contracted HIV may develop better knowledge of the disease, be more inclined to use condoms, and/or be more likely to visit health care facilities.

Other counter intuitive findings may reflect larger socio-cultural processes that place high SES women in SSA at greater risk of exposure to HIV. For example, while the literature argues that the more power a woman wields in her relationship, the more likely she will be able to negotiate safer sexually practices, thereby lowering her HIV risk. But what the Cameroonian results indicate is that having more decision power doesn't necessarily translate to less risk of HIV. It is possible that the 'power' – HIV relationship is really a reflection of the common effects of socioeconomic status (which we know is positively related to riskier sexual behaviors and higher HIV rates). Cameroonian women who are more educated, wealthier and in professional white collar jobs are more at risk, despite the fact that other characteristics of higher SES women (such as knowing how to protect themselves from HIIV, greater access to preventative health care facilities, and greater condom use) should have protected them from infection.

Ultimately, the associations between SES and HIV among women are likely to be mediated by other factors including marital status, region and age (Reither & Mumah, 2009), and more complex multivariate models are required to tease out the unique causal pathways that put high (vs. low) SES women at risk. As part of this research, I will be estimating a series of logistic regression models for Cameroonian women in different

SES strata to explore these complex relationships. The final paper I present at UAPS will summarize my surprising bivariate findings and then will present results of multivariate models that link gender, SES and HIV in Cameroon. Implications for HIV programs and policies in SSA will be discussed.