

WHY ARE THE BENEFITS OF INCREASED RESOURCES NOT IMPACTING THE RISK OF HIV INFECTION FOR HIGH SES WOMEN IN CAMEROON?

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ABSTRACT

The Sub-Saharan (SSA) HIV epidemic presents patterns that challenge conventional understandings of the relationships between SES and health. It has often been assumed that Africa's status as the continent with the highest HIV infection rates is linked to endemic high poverty and a corresponding lack of access to adequate health care resources. Somewhat surprisingly, a growing number of studies show that wealthier individuals (irrespective of gender), wealthier regions (urban areas), and wealthier countries within SSA often display the highest levels of HIV infection. Despite evidence of a positive SES-HIV gradient, researchers and policy-makers frequently assume that range of protective interventions – increasing awareness of mechanisms of HIV transmission, techniques for prevention, greater access to health care facilities, and greater availability of condoms – will reduce the likelihood of contracting HIV, even among higher SES populations. We explore the relationships between SES and a range of intervening risk factors to illuminate the complex causal processes that link SES and HIV in Cameroon. Our results show at least through 2004, any benefit that may have accrued from high SES appears to be offset by higher riskier sexual practices – including more premarital sexual activity, higher numbers of sexual partners, and higher rates of female infidelity.

Background

The Sub-Saharan (SSA) HIV epidemic presents patterns that challenge conventional understandings of the relationships between socioeconomic status and health. It has often been assumed that Africa's status as the continent with the highest HIV infection rates is linked to endemic high poverty and a corresponding lack of access to adequate health care resources. Traditional epidemiological research produced the idea of a 'health gradient' wherein the poorest people in a society are expected to be disproportionately affected by the disease [2, 9, 14, 24]. In SSA, high SES individuals have higher levels of formal education, greater exposure to health education messages and mass media, increased access to health care, and better access to condoms, which should all lower their risk for contracting HIV [2]. Somewhat surprisingly, a growing number of studies show that wealthier individuals (irrespective of gender), wealthier regions (urban areas), and wealthier countries within SSA often display the highest levels of HIV infection [3, 5, 23, 29-31, 39, 41]. Theories for why SES and HIV are positively related often point to social and cultural mechanisms. Of primary interest are patterns of risky sexual behavior that are positively linked to an individual's wealth, including the number of multiple and non-marital sexual partners, and premarital sexual intercourse. For men, level of education and income increases the probability individuals will have non-regular sexual partners, which is known to also increase exposure to STDs including HIV [25, 30]. Kongnyuy and colleagues [25] found that wealthy men in Cameroon had higher rates of HIV infection, which in part was explained by their riskier sexual behaviors including earlier sexual debut, multiple concurrent and lifetime partners, and limited use of condoms with partners other than wives or cohabiting partners.

Similar patterns are found for high SES women. One recent study argues that the 'pursuit of modernity' that explains female risky sexual behaviors in SSA [4]. Evidence from Kenya and South Africa show that materialism and pursuit of consumer goods such as cars, cash and cell phones drives sexual transaction [40]. Having multiple partners can also be a mechanism for achieving upward career mobility. As in the case with wealth, levels of formal education are often associated with increased risk of HIV, particularly in Eastern and Southern Africa [19, 20, 23]. One study found that those with basic primary education had twice the odds of being HIV-positive as those with no education [23]. Interestingly, studies that find a positive association between wealth and HIV often do not find the same pattern with education, suggesting that SES-HIV linkages are complex [18, 20, 33]. Moreover, controlling for other individual characteristics can reduce or eliminate statistical associations between HIV status and education levels [38].

Despite evidence of a positive SES-HIV gradient, researchers and policy-makers frequently assume that a range of protective interventions – increasing awareness of mechanisms of HIV transmission and techniques for prevention, greater access to health care facilities (including HIV testing and counseling clinics), and greater availability of condoms – will reduce the likelihood of contracting HIV, even among higher SES populations. The mechanism for protection is a change in behaviors that could place a person at risk for contracting HIV. In this paper, we examine evidence from a recent nationally representative survey of Cameroonian women and explore how a SES is related to HIV status. Previously published research documented that higher SES women are much more likely to contract HIV than their low SES

counterparts [1, 28, 38]. Our present analysis explores the relationships between SES and a range of intervening risk factors. The findings illuminate the complex causal processes that link SES and HIV in Cameroon.

Data and Methods

Data

The 2004 Cameroon Demographic and Health Survey (CDHS), is a nationally representative survey involving residents aged 15-49. The CDHS uses a multi-stage complex cluster sampling methodology with response rates well in excess of 90 percent [37]. The CDHS included 5,155 female respondents in the sample, with conclusive test results for all but one case. The ability to link HIV testing with individual characteristics provides a unique opportunity to assess factors associated with HIV infection.

Measures

This study examines the relationships between socioeconomic status (SES), HIV status, and two main sets of intervening variables. Socioeconomic status (SES) is captured both at the household-level (based on a *wealth index*) and individual-level (respondent educational attainment and occupational status). Because of the relational nature of exposure to HIV transmission, the SES characteristics of a woman's partner (education and occupation) are also included in the analysis. The first set of intervening variables reflects better access to health care and information, which we expect to increase with higher levels of SES and knowledge of HIV infection and prevention mechanisms, was measured by constructing an additive scale for using 15 knowledge items in the CDHS. The second set of intervening variables reflect the cultural and behavioral practices that should be impacted by greater access to health care, higher rates of HIV knowledge, and rising SES. These factors include measures for risky and protective sexual behaviors and indicators for a woman's power in her relationships. Power in relationships is captured in scale constructed from questions about household decision making attitudes toward wife beating, and perceptions of a woman's power in sexual decision-making.

Analyses

Three types of bivariate analyses are used: cross tabulations, ANOVA-tests, and *t*-tests are utilized to illustrate associations among SES, the various intervening variables, and HIV status. We begin by describing the relationship between HIV and all the other variables to highlight the factors most associated with HIV infection among women in Cameroon. Second, we unpack the relationships between SES and the intervening variables to see if SES is associated with the expected intervening variables that should increase or decrease HIV risk. Finally, we look to see if the relationships between intervening variables and HIV status persist when the analysis is restricted to high SES women.

Some Preliminary Results

Preliminary results show that household wealth, educational attainment, and occupational status are significantly and positively related to HIV status among women in Cameroon (*table not shown*). A woman's partners' SES is also associated with her HIV status. Among the 23 percent of women with no current partner, HIV rates are relatively low (3.5 percent). However, the

incidence of HIV among women increases systematically with her partners' educational attainment and occupational status.

Surprisingly, there is a strong pattern where women with greater access to and use of health care facilities have higher rates of HIV. It is unlikely that the use of health care resources causes HIV infection, so this counterintuitive finding may reflect a pattern in which HIV-positive women are more likely to go to health care providers because they suffer from symptoms of the disease. Alternatively, women living in more remote rural areas have less access to health care, but also face a much lower overall background rate of population HIV infection. A similarly puzzling pattern is seen where women who have higher rates of condom use are also more likely to test positive for the HIV virus. Again, it is possible that condom use is caused by positive HIV status (rather than vice versa). Meanwhile, as expected women who report engaging in risky sexual behaviors are more likely to have HIV.

Finally, we compared the mean scale scores for HIV positive and negative women on a set of indicators for HIV knowledge, premarital sexual experience, and three indicators of a woman's power in her personal relationships (where higher values reflect higher power) *table not shown*. The results suggest that HIV positive women have higher levels of knowledge of HIV transmission and prevention, more years of premarital sexual experience, and higher scores on one of the three power scales.

Relationship between SES and Sexual Behaviors

A woman's SES was significantly associated with both protective and risky sexual behaviors, though the pattern was not consistent across different measures (Table 1). Condom use was significantly and positively associated with a woman's SES. Specifically, women in high wealth households, with secondary or post-secondary education, and with professional/white collar jobs report dramatically higher rates of past and present condom use than women in the other SES groups. By contrast, condom use among women with no formal education or living in low wealth households was almost non-existent.

The pattern is somewhat different for risky behaviors. Women in higher wealth households and post-secondary education reported less alcohol use at last sexual intercourse and were less likely to initiate sexual activity before the age of 15. However, these high SES women were the most likely to report recent sex with a partner other than their current partner (infidelity), and to have had more than 1 sexual partner over the previous year. A similarly complex story can be told of the relationship between occupation and the incidence of risky sexual practices.

Table 1: Relationship between SES and Sexual Behaviors, Women Respondents, CDHS 2004

| <u>Percent Reporting Behavior</u> | | | | | | | |
|-----------------------------------|---------------------------|----------------------------|------------------------|------------------|-------------------------|--|--|
| Protective Behaviors | | | | Risky Behaviors | | | |
| Condom Use Ever (yes) | Condom Use Last Sex (yes) | Condom Use Currently (yes) | Alcohol Last Sex (any) | Infidelity (Yes) | Multiple Partners (yes) | Early First Sexual experience (under 15) | |

| | | | | | | | |
|--|----------|----------|----------|----------|-----------|----------|----------|
| Wealth | | | | | | | |
| Low | 15 | 4.4 | 2.8 | 16 | 5.0 | 4.4 | 41 |
| Medium | 32 | 9.1 | 6.2 | 15 | 10.7 | 7.0 | 36 |
| High | 49 | 18.2 | 16.6 | 14 | 12.6 | 8.5 | 30 |
| χ^2 | 509.9*** | 191.7** | 240.8*** | 16.02** | 68.17*** | 26.83*** | 53.81*** |
| Gamma | 0.531*** | .513*** | .616*** | -.083*** | .313*** | .240*** | -.176*** |
| Education | | | | | | | |
| No Educ. | 1.6 | 0.9 | 0.1 | 11.6 | 1.0 | 0.4 | 45.0 |
| Primary | 27.5 | 8.0 | 5.8 | 16.6 | 9.1 | 7.2 | 36.2 |
| Secondary | 55.4 | 19.4 | 16.9 | 14.8 | 14.4 | 9.4 | 28.9 |
| Higher | 66.3 | 33.3 | 35.4 | 7.3 | 11.5 | 8.3 | 16.8 |
| χ^2 | 956.9*** | 298.5*** | 339.3*** | 59.26*** | 138.46*** | 87.22*** | 95.63*** |
| Gamma | .711*** | .621*** | .693*** | -.059** | .455*** | .400*** | -.228*** |
| Occupation | | | | | | | |
| Unemployed | 36.8 | 14.8 | 12.9 | 9 | 9.6 | 6.9 | 43.8 |
| Ag Sector | 18.5 | 4.2 | 2.7 | 19 | 5.2 | 4.4 | 33.3 |
| Man/Dom | 43.8 | 14.4 | 11.5 | 17 | 14.5 | 9.2 | 27.9 |
| Prof/Wcollar | 68.2 | 20.2 | 20.5 | 19 | 17.1 | 9.0 | 9.4 |
| χ^2 | 365.9*** | 140.7*** | 161.9*** | 237.7*** | 86.9*** | 28.62*** | 158.8*** |
| Cramer's V | 0.267*** | .167** | .178*** | .152*** | .130*** | .075*** | .176*** |
| χ^2 = Chi Square ** $p < .01$ *** $p < .001$ | | | | | | | |

Finally, we compared mean scores on the knowledge, premarital sex, and decision-making power scales among women in different SES groups (Table 2). As expected, higher SES women reported consistently higher levels of knowledge about HIV transmission and prevention methods. Women with secondary and post-secondary education had scores that were almost double that of women with no formal education. A woman's occupation was also significantly associated with knowledge of HIV prevention method, with women in professional/white collar professions commanding the highest mean knowledge score and women in agricultural professions reporting the lowest scores. Interestingly, SES was also significantly and positively associated with the duration of premarital sex. Whether measured by wealth, education, and occupation, high SES women reported consistently greater gaps between their initiation of sexual activity and their first marriage.

Table 2. Relationships between SES and HIV Knowledge, Relationship Power, and Premarital Sexual Exposure, CDHS 2004

| SES | <u>Mean Index Scale Score</u> | | | | |
|-----------------|---|------------------------------------|-----------------------------------|-------------------------------|-------------------------------------|
| | Knowledge of HIV & HIV Prevention Methods | Domestic Decision Making Authority | Attitudes Toward Sexual Decisions | Attitudes Toward Wife Beating | Years of Premarital Sexual Exposure |
| All Respondents | 7.10 | 1.84 | 3.30 | 1.53 | 29 |

| | | | | | | |
|--------------|-------|-------|-------|-------|-------|--|
| Wealth | | | | | | |
| Low | 5.89 | 1.69 | 3.23 | 1.87 | 1.33 | |
| Medium | 6.97 | 1.84 | 3.24 | 1.67 | 2.03 | |
| High | 8.18 | 1.97 | 3.41 | 1.16 | 2.38 | |
| <i>F</i> | 424.2 | 15.56 | 20.14 | 99.53 | 46.37 | |
| Significance | *** | *** | *** | *** | *** | |
| Education | | | | | | |
| No Educ | 4.87 | 1.50 | 3.06 | 1.96 | 0.51 | |
| Primary | 6.80 | 1.95 | 3.30 | 1.70 | 1.97 | |
| Secondary | 8.51 | 1.84 | 3.45 | 1.17 | 2.53 | |
| Higher | 9.29 | 2.82 | 3.56 | 0.28 | 4.37 | |
| <i>F</i> | 681 | 30.7 | 35.94 | 83.74 | 89.4 | |
| Significance | *** | *** | *** | *** | *** | |
| Occupation | | | | | | |
| Unemployed | 7.37 | 1.11 | 3.29 | 1.41 | 1.56 | |
| Ag Sector | 6.26 | 2.36 | 3.26 | 1.78 | 1.79 | |
| Man/Dom | 7.56 | 3.31 | 3.35 | 1.53 | 2.29 | |
| Prof/Wcollar | 9.01 | 2.09 | 3.48 | 0.58 | 4.19 | |
| <i>F</i> | 159 | 299 | 4.78 | 42.25 | 33.9 | |
| Significance | *** | *** | ** | *** | *** | |

N=5154

ANOVA F-test significance levels: ** = $p < 0.01$; *** = $p < 0.001$

Higher SES women also report generally higher levels of decision-making power and authority in their relationships. Women in the highest wealth quintile had the highest score on a domestic decision-making index. Educational attainment and domestic decision-making authority was somewhat more complicated. As expected, women with post-secondary education had the highest score, however, women with secondary education had a slightly lower mean score compared to women with primary level education. Post-hoc significance tests suggest that the differences between these two intermediate groups were not statistically meaningful. Finally, decision-making authority was significantly associated with a respondent's occupation. Women in professional/white collar professions commanded the highest average decision-making authority compared to the other professions. There was a general positive and significant association between a woman's SES and her attitudes toward sexual decision-making power, though the absolute value of these differences was less dramatic. Women in high wealth households, most formal education, and professional/white collar occupations identified more situations in which a wife would be justified in refusing to have sex with her husband. On average, high SES women were less likely to think wife beating was justified compared to women in lower SES groups

Discussion

The positive relationship between SES and rates of HIV infection in Cameroon reflects the fact that increased access to health care, HIV information, and personal power (all associated with rising SES) have not yet translated into reductions in risky behaviors that are known to increase transmission of HIV. Higher SES women do in fact have greater access to medical help,

command greater knowledge of HIV prevention methods, more use of condoms (albeit still relatively low), as well as greater decision making authority within their relationships, but these links fail to protect them from having high HIV rates.

Why are the benefits of increase resources not protecting women? At least through 2004, any benefit that may have accrued from high SES appears to be offset by higher riskier sexual practices – including more premarital sexual activity, higher numbers of sexual partners, and higher rates of female infidelity. This suggests that economic vulnerability and traditional gender roles may not be the only risk factors that put women in SSA at greater risk of contracting HIV. High SES women, in particular, engage in more risky behaviors, and may also be at increased risk through their relationships with higher SES men (who have been shown in previous research to engage in riskier practices also [25]). These results support the idea that the pursuit of modern identities can create aspirations and desires for social mobility and demand for consumer goods that can lead to riskier behaviors among high SES women [2].

Moreover, the results fail to support the expectations of traditional gender theory in that greater household and sexual decision-making power (and progressive attitudes toward sexual violence) has not necessarily translated into lower risks of HIV in Cameroon. Of course, it is possible that the unexpected positive relationship between ‘power’ and HIV reflects the spurious effects of a third common variable associated with socioeconomic status (perhaps culturally-driven riskier sexual behaviors among high SES males and females). It is also worth noting the fact that delayed marriage and longer periods of premarital sexual activity significantly increases risk for high SES women [7].

Taken as a whole, the preliminary results suggest that traditional approaches to HIV prevention which rely on poverty reduction, improving access to health care, improving HIV knowledge, and boosting women’s social and economic power may be insufficient to address other drivers of HIV infection among women in SSA. In particular, the persistence of risky behaviors among higher SES populations suggests that a targeted program to change cultural practices and mores might be required to prevent the continued spread of the disease. Targeted intervention to address the impacts of infidelity and reducing sexual concurrency among well off women would appear to be warranted.

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