



International Journal of Social Research (ISSN:2576-5531)



Gendered Inequalities in HIV/AIDS: Investigating Linkages between Degradation, Disenfranchisement, Unemployment and Disease

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ABSTRACT

The purpose of this paper is to examine the social, political, economic, and environmental forces that shape disproportionate HIV rates among women in less-developed countries. Specifically, we analyze how environmental degradation and women's property rights condition female unemployment rates in poor nations and ultimately, patterns of disease. Using data from 105 less-developed nations, we construct a structural equation model to analyze influences on the proportion of HIV cases among women. We find that environmental degradation is an important, though often overlooked factor contributing to the female HIV burden across nations, through mechanisms such as female unemployment, disenfranchisement, and poor access to socio-health services. We also find that restrictions on property rights for women impact female unemployment and access to health services. Conclusions point to the efficacy of incorporating ecofeminist frameworks that emphasize ecological conditions alongside political, economic, and social forces to explain global health and gender inequalities in HIV/AIDS.

Keywords: HIV/AIDS; Gender; Environment; Unemployment; Ecofeminism

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How to cite this article:

Kelly F. Austin, Laura A. McKinney. Gendered Inequalities in HIV/AIDS: Investigating Linkages between Degradation, Disenfranchisement, Unemployment and Disease. International Journal of Social Research, 2021; 5:52.

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The HIV/AIDS pandemic poses significant threats to the health and well-being of individuals the world over, although there are dramatic gaps in the likelihood of acquiring HIV across spatial positions and social locations. Systematic investigations have discerned substantial differences in HIV transmission across and within nations (e.g. Austin and Noble 2014; Mabala 2006; Gray 2004; Rodrigo and Rajapaske 2010; WHO 2016, 2018). Across nations, there are demonstrable gaps in HIV incidence with the greatest burden falling on less-developed nations. Within poor nations, women are often most vulnerable to acquiring HIV (e.g. Heimer 2007; Rodrigo and Rajapaske 2010; WHO 2016).

What began as a virus commonly understood as a primary concern for individuals who inject drugs and men involved in homosexual activities has undergone considerable transformation since its inception. The changing face of HIV/AIDS evidences marked shifts in the burden of disease from men to women, thus requiring rigorous examination of gender inequality as HIV/AIDS now represents the leading cause of death for women of reproductive age (UNAIDS 2016; WHO 2016, 2018). Moreover, the concentration of HIV/AIDS cases among young women within less-developed nations highlights the need for research that interweaves gender, health, and development as key dimensions that shape susceptibility to disease.

Prior research in this vein highlights the importance of women's status and economic insecurity in explaining women's vulnerability to HIV/AIDS (Austin, Choi and Berndt 2017; Bandalí 2011; Burroway 2012; Dunkle et al. 2004; Mojola 2011; Stillwaggon 2006; Stoebenau et al. 2016; Wojcicki 2002). Unemployment is a critical facet of HIV/AIDS acquisition among this subset of the population as economically disempowered women lack access to preventative healthcare services and are unable to exercise autonomy in negotiating reproductive rights with their partners. What is not known, and what this research seeks to address, are the underlying causes of female unemployment in poor nations. To do so, we draw on theoretical postulations

from ecofeminist perspectives that posit linkages connecting environmental conditions to the status of women (Mies 1998; Mies and Shiva 1993; Shiva 2016). We then test derived hypotheses using quantitative data from 105 less-developed nations to discern the degree to which environmental destruction conditions the status of women and their HIV burden.

Given our focus on gender inequality in the HIV pandemic, we employ a specific measure of female HIV—the percent of HIV cases among women—to capture the unequal distribution of HIV cases by gender. The percent of HIV cases among females depicts unequal variation in the HIV burden across gender by indicating of those who have HIV, the percent that are women. We find this a superior approach to female prevalence rates that are largely driven by the overall presence of HIV. In fact, at the cross-national level, female prevalence and total prevalence of HIV tend to be correlated at $>.95$. Thus, especially with cross-national data, focusing exclusively on levels can be deceiving as they do not convey information about the gender distribution of disease within nations, and it is precisely this unequal distribution of HIV cases among men and women that characterize current disease trends and are most likely to derive from gender inequalities focal to our analysis.

To anticipate, our results demonstrate the deleterious effects of environmental degradation on the economic and social status of women, their formal employment, and, subsequently, the proportion of HIV/AIDS cases among women. We conclude that future examinations of HIV/AIDS should incorporate emphasis on environmental determinants commonly overlooked within the subfield alongside well-known factors (e.g., gender inequality, development differentials) associated with the spread of HIV/AIDS, to which we now turn.

Women's Vulnerability to HIV/AIDS in Less-Developed Nations

As treated above, HIV predominantly affects women in less-developed countries (WHO 2018). For example, over 95% of HIV cases are individuals residing in developing nations and

two-thirds of new infections occur in Sub-Saharan Africa, the poorest region of the world (WHO 2018). Thus, HIV is closely related to broader cross-national trends of international inequality. Importantly, girls account for more than 80% of all new HIV infections among adolescents and young adults. Globally, adolescent girls and young women (aged 15-24 years) are twice as likely as their male counterparts to acquire HIV. Overall, women now make up almost 60% of worldwide HIV/AIDS cases and this disease represents the primary cause of death for women of reproductive age (WHO 2018).

The human immunodeficiency virus (HIV) is a retrovirus that attacks immune system cells, impacting or impairing their function. Heterosexual intercourse is the most common pathway of HIV spread in less-developed nations. However, women have unique biological characteristics that increase their chances of getting HIV in comparison to men when having unprotected sex, such as normal hormonal changes, vaginal microbial ecology and physiology, and an increased likelihood of having a sexually transmitted infection (Quinn and Overbaugh 2005). Overall, during intercourse women have a larger area of exposure of the vaginal epithelium and are subject to a larger volume of genital fluids from men. Moreover, semen contains higher viral loads than vaginal fluids. Young women with virgin or immature genital tracts are also more likely to experience tearing or lesions during intercourse, facilitating easier HIV transmission (Quinn and Overbaugh 2005).

Biological factors alone do not account for women's disproportionate risk of HIV/AIDS. Women in poor nations also face distinct social, economic, political, and environmental vulnerabilities to HIV (e.g. Heimer 2007; McKinney and Austin 2016; Stillwaggon 2006; Smith 2002). Gender inequality and gender-based discrimination are common in less-developed nations in which traditional cultures, conservative gender norms, and pronounced adherence to patriarchal and sexist belief structures pervade. In these communities, women lack the ability to make safe and autonomous decisions about sex

and reproductive health (e.g. Heimer 2007; Stillwaggon 2006). Women in poor nations often face economic insecurities that compound inadequate access to education and limited health services, which are critical to HIV prevention (e.g. Austin and Noble 2014; Burroway 2010; Heimer 2007; Rodrigo and Rajapakse 2010).

While data clearly demonstrate that poor nations have the highest burden of HIV rates cross-nationally, a growing body of research debates whether it is the poor or the wealthy within less-developed nations who are most vulnerable to HIV (e.g. Rodrigo and Rajapakse 2010). On the one hand, greater wealth can translate into more opportunities for unsafe sex, such as through paid sex, extramarital relationships, and drug use (e.g. Fox 2010; Mishra et al. 2012). Also, although urban residents in developing nations to be wealthier and more educated than rural dwellers, urbanites have access to a greater number of potential partners, including migrant workers, and tend to encounter less conservative sexual norms. On the other hand, poverty also confers an array of risk factors, including fewer opportunities for formal employment and greater likelihood to resort to transactional sex, a point returned to below, as well as reduced access to education and healthcare services. In a careful review of published research comparing wealth versus poverty vulnerabilities to HIV in developing nations, Rodrigo and Rajapakse (2010) conclude that the majority of studies find specific disadvantages for women due to poverty, as opposed to studies that focus on wealthier classes within poor nations, which tend to find no gender difference in HIV risk between men and women. Reflective of this conclusion, many studies conducted at the cross-national level on gender and HIV emphasize access to healthcare, contraceptive use, fertility rates, and educational enrollments as important predictors of women's HIV (e.g. Austin and Noble 2014; Burroway 2012; McKinney and Austin 2015; Shircliff and Shandra 2011). Indeed, high fertility in tandem with low contraceptive use represent key predictors of HIV among women (Austin and Noble 2014),

as well as common measures of women's status and reproductive rights (Wickrama and Lorenz 2002). Use of contraceptives is important to consider when examining trends in HIV/AIDS, as typical contraceptives, like condoms, directly prevent against HIV infection. Use of other types of contraceptives, such as oral contraceptives, also indicate a level of reproductive autonomy that translates to lower risk of unprotected or unwanted sex (e.g. Clark and Peck 2012; Heimer 2007; Stillwaggon 2006; Wickrama and Lorenz 2002).

A wide body of comparative research emphasizes the importance of women's participation in secondary schooling in explaining cross-national variation in HIV rates among women (Burroway 2010, 2012; Clark and Peck 2012; Shircliff and Shandra 2011). In general, nations with greater participation in female education tend to have better health. Although there may be some variation within countries, as noted above, education can help refocus young women's goals on future opportunities, as well as providing direct information on negotiating safe sex and disease prevention (e.g. Heimer 2007; Stillwaggon 2006). Overall, educated women tend to have greater autonomy in negotiating their sexual health to prevent HIV acquisition (Stillwaggon 2006; Wickrama and Lorenz 2002).

Based on prior cross-national research, we therefore predict that: (H₁) *women's contraceptive use, low fertility rates, access to healthcare, and participation in education are important in reducing women's share of the HIV burden across less-developed nations.*

In addition to health resources and education, other research considers the political or legal economic standing of women as a major determinant of disease, including HIV/AIDS. Many scholars emphasize that women's legal access to land, loans, and other types of property tend to be associated with lower levels of HIV (Burroway 2012; Dworkin et al. 2014; Muchomba, Wang, and Agosta 2014; Stillwaggon 2006; Sweetman 2006). Building on this line of research, we contend that enhancing women's legal economic rights can reduce women's

disproportionate HIV risk by improving women's economic stability, autonomy, and access to health-promoting resources, like education and contraceptives. In other words, we predict that: (H₂) *nations with legal access for women to land, loans, and other property will have increased use among women of key health resources that prevent HIV, such as education and contraceptives.* In subsequent sections, we expand further on how legal economic rights may impact formal employment opportunities for women. Before returning to this point, we explore other factors widely accepted to influence HIV in less-developed nations.

Religion is also important to consider when investigating women's HIV vulnerabilities. Predominantly, many cross-national studies document that Muslim countries tend to have lower HIV/AIDS rates, especially among women, than non-Muslim countries (Austin and Noble 2014; Burroway 2010; Gray 2004; McIntosh and Thomas 2004). This trend may reflect the strict rules surrounding sex common to Islam, including abstinence before marriage and condemning extramarital sex, homosexuality, and prostitution, as well as customs such as circumcision (Gray 2004). We therefore predict that: (H₃) *nations with large Muslim populations will have a lower share or burden of women with HIV.* We test additional avenues of potential influence from Muslim affiliation, as Islamic traditions can impact measures of women's status included in our analysis, such as female unemployment and access to education and contraceptives (e.g. Gray 2004). Given this, we simultaneously predict that (H₄) *nations with large Muslim affiliations indirectly increase female HIV burden by restricting opportunities for formal employment and access to health-promoting resources among women.*

Overall, prior research on gender inequality in the global HIV/AIDS pandemic focuses on dimensions of women's empowerment in explaining women's disproportionate vulnerability to HIV across less-developed nations, including fertility rates, contraceptive use, access to healthcare, participation in education, and legal

rights to land, loans, and property. Emerging work builds further on gender stratification themes to consider how factors such as unemployment and environmental decline shape disease vulnerabilities for women (e.g. Austin et al. 2017; McKinney and Austin 2016). In the following section, we investigate and integrate these emergent lines of inquiry to show how environmental conditions and economic rights for women are important in creating structural conditions that disproportionately disfavor women's ability to protect themselves against HIV transmission.

Degradation, Disenfranchisement, Unemployment, and HIV

As treated above, recent work analyzing the underlying factors contributing to HIV rates among women identify the importance of unemployment and economic insecurity as major risk factors for contracting the disease (e.g. Austin et al. 2017; Bandali 2011; Dunkle et al. 2004; Mojola 2011, 2014; Oyefara 2007; Stoebenau et al. 2016). Economically disempowered women are more susceptible to HIV transmission due to their lowered autonomy and inability to negotiate safe sex practices with their partner. Impoverishment and lack of stable employment leads some women to engage in risky sex practices to secure resources needed by the household, such as the documented "sex for fish" trades in the Lake Victoria region of Africa (Bandali 2011; Dunkle et al. 2004; Mabala 2006; Mojola 2011; Oyefara 2007; Weiser et al. 2007; Wojcicki 2002). In addition to basic household necessities, many women engage in transactional sex for "consumer items," such as makeup and clothes (Leclerc-Madlala 2008; Mojola 2014; Stoebenau et al. 2016). Given its importance to preventing HIV transmission, it is critical to explore the upstream causes of unemployment among women, precisely what this research provides.

As an important precedent to unemployment and HIV vulnerability, women's legal and economic rights are critical considerations. The ability of women to acquire loans, land, and other forms of property has obvious implications for securing

formal employment and access to resources needed to sustain their health and that of their households, including protection against HIV (Burroway 2012; Dworkin et al. 2013; Muchomba et al. 2014; Sweetman 2006). When women are disenfranchised from loans, land, and property they are unable to secure income and critical resources that would otherwise enhance their autonomy (Heimer 2007; Izumi 2007). Such circumstances reflect a society that does not value women's contributions outside the "home". Ecofeminist perspectives speak to this point, as will be elaborated below, articulating that capitalism is an accumulation process necessitated by women's oppression through conditions that foster "unpaid" work (e.g. Mies and Shiva 1993). Restricting women's access to land, loans, and property limits opportunities for self-employment and formal employment outside the home. As emphasized above, a lack of economic security translates into poor health profiles insofar as women lack the power to negotiate safe sex and may resort to risky sex practices to provide for themselves and their families (e.g. Austin et al. 2017; Dunkle et al. 2004; Oyefara 2007). We therefore predict that: (H₅) *women's legal economic rights to land, loans, and other types of property are significant mechanisms for reducing unemployment among women, which then decreases vulnerability to HIV.*

An emerging area of emphasis within the environmental sociological literature focuses on the gendered nature of individuals' experiences with their environments (Ergas and York 2012; McKinney 2014; McKinney and Fulkerson 2015). Ecofeminist scholars argue the structure and logic of the world economic regime is such that large portions of costs associated with capitalist production are absorbed by women and the environment, resulting in their interconnected domination and exploitation (Dunaway 2001; Mies and Shiva 1993; Shiva 2016; Warren 1990). A basic premise in ecofeminist thinking is that environmental quality is inextricably linked to the overall status, health, and well-being of women. This is due in large part to the traditional

household duties and responsibilities accorded to women that result in their heightened vulnerability to ecological losses (Mies and Shiva 1993; Mies 1998; Rocheleau, Thomas-Slayter, and Wangari 1996). This is especially pronounced in less-developed nations in which women are primarily responsible for subsistence farming and fetching water (Boserup 1970; Dunaway 2001; Rocheleau et al. 1996); consequently, environmental declines, such as soil infertility and water contamination, impair women's ability to provide food for themselves and the household (Masanjala 2007).

Reduced availability in the quantity and quality of natural resources complicates women's lives in numerous ways, with the worse disadvantages concentrated along predictable lines of colonial, racial, class, wealth, and power divides. As women seek to perform household duties of gathering food, fuel, water, and fiber, declines in environmental quality present a growing challenge encountered in their daily lives (Dunaway 2001; Dunaway and Macabuac 2007). For example, women must walk farther to find clean water when nearby sources are contaminated or compromised; they have to hoe longer and farther from the home when soils are depleted. The sheer physical taxation of increasingly onerous pursuits for resources imposes direct burdens to women's health. The prolonged search for resources also diverts women's time away from educational or economic opportunities that are powerful avenues for advancing their overall status and autonomy. Growing demands on women's time resulting from environmental declines complicate aspirations to seek formal employment outside the household, reducing the overall autonomy and economic stability of women with companion reductions in health and well-being (Dunaway 2001; Shiva 2016). Moreover, the dwindling availability of resources used in handicrafts and other cottage industries poses challenges to women who rely on these activities for income (Dunaway and Macabuac 2007). We therefore predict that: (H₆) *countries with elevated levels of ecological degradation will have higher levels of female unemployment, which*

then impacts women's disproportionate vulnerability to HIV.

Access to land and environmental resources is impacted by several nuanced, contextual factors (Kameri-Mbote 2006). Legacies of colonialism have left very complex legal systems for land tenure in former colonies (see e.g., Henrysson and Joireman 2009) while simultaneously creating conditions of global dependency or "maldevelopment" (see Shiva 2016) maintained by unequal ecological exchanges that siphon resources from less-developed countries at wholly unsustainable rates, disproportionately imperiling the health and wellbeing of marginalized individuals in these nations. This is especially consequential for the economic empowerment and wellbeing of women given their unique challenges of reproductive health, caregiving, and gender-based discrimination and violence (Peterman 2011). Globalization and development regimes that motivate intensive cultivation and land use practices also tend to alienate women as managers of environmental resources, particularly when new technologies are not made available to women (Shiva 2016). In the case of widows and orphaned children, land inheritance is directly complicated by environmental degradation as multiple actors seek to stake claim to sub-divided parcels of land to survive in areas fraught with soil infertility, rampant drought or flooding, and other such inhospitable features of environmental quality (Kameri-Mbote 2006). Socially constructed gender norms of masculinity and femininity correlate with specific power relations and entitlement to resources, and customary laws based on strict interpretations of gender as the primary social factor determining land tenure often prevail (Kameri-Mbote 2006; Whitehead and Tsikata 2003). Moreover, women are rarely financially able to access dispute resolution channels when conflicts regarding ownership rights arise and if they are, rulings often favor male ownership (Dworkin et al. 2014; Peterman 2011). Thus nations with high levels of environmental degradation tend to have exclusionary tactics (either customary or public law) that disenfranchise marginalized groups from deed-

ed property, particularly women (Henrysson and Joireman 2009; Izumi 2007; Whitehead and Tsikata 2003). The failure of political and legal systems to grant or guarantee women's access to loans, land, and property heightens susceptibility to disease among women (Izumi 2007; Muchomba et al. 2014; Peterman 2011; Terry 2007; Walsh 2005). We therefore predict that: (H₇) *countries with elevated levels of ecological degradation will have disenfranchised property rights and reduced access to socio-health resources among women, which then impacts their disproportionate vulnerability to HIV.*

Taken together, unemployment and disenfranchisement are critical facets of gender inequality that exacerbate HIV incidence among women, but we know little about the upstream factors shaping these dynamics. Ecofeminist theories are instructive in this regard, as they assert that environmental quality is intimately interlinked to and determinative of the status of women through a variety of mechanisms. In addition to the traditional household division of labor that links women's work to environmental conditions, degradation impacts opportunities in handicrafts, agriculture, and tourism, where women are popularly employed. Thus, there are myriad ways in which environmental quality is tied to the status of women. We construct a structural equation model to test these hypotheses, to which we now turn.

Sample

In this study, we analyze a sample of less-developed nations, given the relevance of the topics under investigation and the concentration of HIV/AIDS in poorer countries. We follow prior researchers in defining less-developed nations as those in the lower three quartiles of the World Bank's Income Classification of Countries.¹ Our sample includes 105 less-developed nations for which complete data are available on the dependent variable, the percent of HIV cases among women. We include the list of nations included in the sample in Table 1.

Analytic Strategy

We utilize structural equation modeling (SEM) to assess the percent of HIV cases among women

cross-nationally. We utilize SEM for several reasons. Predominantly, SEMs are particularly well suited to this analysis as the theorization and substantive evidence discussed above suggests there may be complex pathways involving environmental decline, legal rights for women, unemployment, socio-health resources, and women's burden of HIV/AIDS. The use of SEM allows us to easily calculate not only the direct effects of socio-health resources or unemployment on women's share of HIV cases, for example, but also the indirect and total effects of environmental degradation and women's property rights. These indirect and total effects, while frequently theorized in prior literature, are often left unexplored in studies that use traditional regression-based methods (e.g. Noble 2019).²

An additional attribute of SEM is the utilization of the maximum likelihood (ML) missing value routine that calculates pathway coefficients on the basis of all available data points. If data for cases are missing information on select variables, the observations are dropped from those pathway estimations but retained for others when data are available.³ Thus, SEM allows us to utilize a larger sample of nations by retaining cases that might be missing data on one or two control variables. In addition, we hypothesize that contraceptive use, fertility rates, access to medical personnel, and participation in schooling for women are highly correlated and represent an underlying latent variable, "socio-health resources." Similarly, we predict that women's formal access to land, loans, and other types of property relate to one another and represent underlying indicators of women's legal property rights. The SEM framework allows for the inclusion of latent variables and for the estimation of unbiased coefficients, even when the independent variables are highly correlated. Thus, complications due to multicollinearity are eliminated. SEMs also allow researchers to compare the theoretically derived, hypothesized model to the actual data, providing an estimate of model "fit" to the data provided. Collectively, these features make SEM a superior methodological approach for this line of research.

Table 1: Nations Included in the Analysis (N=105)

Afghanistan	Fiji	Niger
Angola	Gabon	Nigeria
Argentina	Gambia, The	Pakistan
Armenia	Georgia	Panama
Azerbaijan	Ghana	Papua New Guinea
Bahamas, The	Guatemala	Paraguay
Bangladesh	Guinea	Peru
Barbados	Guinea-Bissau	Philippines
Belarus	Guyana	Rwanda
Belize	Haiti	Sao Tome and Principe
Benin	Honduras	Senegal
Bhutan	India	Sierra Leone
Bolivia	Indonesia	Somalia
Botswana	Iran, Islamic Rep.	South Africa
Burkina Faso	Jamaica	South Sudan
Burundi	Kenya	Sri Lanka
Cabo Verde	Kyrgyz Republic	Suriname
Cambodia	Lao PDR	Swaziland
Cameroon	Lesotho	Tajikistan
Chad	Liberia	Tanzania
Chile	Madagascar	Thailand
Colombia	Malawi	Togo
Comoros	Malaysia	Trinidad and Tobago
Congo, Dem. Rep.	Maldives	Tunisia
Congo, Rep.	Mali	Uganda
Costa Rica	Mauritania	Ukraine
Cote d'Ivoire	Mauritius	Uruguay
Cuba	Mexico	Uzbekistan
Djibouti	Moldova	Venezuela, RB
Dominican Republic	Mongolia	Vietnam
Ecuador	Morocco	Yemen, Rep.
Egypt, Arab Rep.	Mozambique	Zambia
El Salvador	Myanmar	Zimbabwe
Equatorial Guinea	Namibia	
Eritrea	Nepal	
Ethiopia	Nicaragua	

It is important to acknowledge our adherence to the key assumptions of SEM: (1) multivariate normality, (2) completely random missing data, (3) sufficiently large sample, and (4) correct model specification (Kaplan 2009). To address the potential negative consequences of multivariate non-normality, we also performed the analyses using the robust ML estimator (MLR) implemented in Mplus, which are robust to non-normality (Muthen and Muthen 2007). The results were consistent with those achieved with the basic ML procedure. With regards to missing

data, the use of the maximum likelihood (ML) estimator provides consistent estimates under the assumption of missing at random, which is an easier condition to satisfy than missing completely at random. Additionally, we do not see any pattern to the missing data to suggest that the data are not missing at random. As indicated in footnote 2, we also conducted analyses on a listwise-deleted sample and achieved consistent substantive results to those presented below. Because our sample is relatively modest in meeting assumptions about sample size, we

also conducted our analyses with bootstrap standard errors as well as a robust ML (MLR) procedure and obtained estimates and model fit statistics for the path diagram that were consistent with the ML estimator (results available upon request). In order to guard against model specification errors, we draw thoroughly on prior research and theory in selecting our variables and composing the models. Our review of the literature merges perspectives on gender, development, the environment, and health into our structural model.

A potential weakness of this study involves the use of a cross-sectional design. However, reliable and expansive longitudinal data on a variety of indicators used, including women's HIV data, are not available over multiple time points in a consistent manner.⁴ To improve conditions of causality and address the unique nature of HIV where there may be years between contracting the disease and testing positive for it (especially among poor populations), the variables are time-ordered, where the independent variables are measured prior to the dependent variables. Specifically, the women's percent of HIV is measured for the year 2016, female unemployment and socio-health resources variables are measured for the year 2010, and the property rights and economic development indicators are measured in 2009 and 2008, respectively.⁵

Variables Included in the Analyses

We employ the percentage of HIV cases among females as the dependent variable for this study. This measure, the percent of the population age 15+ living with HIV who are female, obtained from the World Bank (2018), is based on HIV estimates originally published by the Joint United Nations Programme on HIV/AIDS or UNAIDS. As mentioned previously, we prefer to utilize a relative or ratio measure of the female HIV burden rather than an overall prevalence or

incidence measure as recent research illustrates that gender-specific HIV prevalence rates may not appropriately capture gender inequalities in the burden of disease (e.g. Austin and Noble 2014). As current trends emphasize the rising HIV burden among women relative to men, we examine the proportion of HIV-infected individuals who are women to appropriately vet gender stratification and ecofeminist themes explored above that emphasize disproportionate impacts on the health and wellbeing of women in less-developed nations.¹ This is consistent with prior cross-national research focusing on how gender inequalities manifest in the distribution of this disease in poor nations (e.g. Austin and Noble 2014; Austin et al. 2017).

Environmental degradation, or bio-capacity losses, represents a key independent variable in this analysis. Biocapacity losses are measured as the percent change in domestic ecological resources for the years 1971–2001. This variable, taken from the Global Footprint Network (2010), quantifies accumulated reductions in the amount of biologically productive resources available to individuals in a nation and includes stocks of grazing land, cropland, forest land, and fishing grounds. This measure has been utilized as a broad measure of overall environmental degradation in similar analyses (e.g. McKinney and Austin 2015).

Female unemployment rate refers to the percent of the female labor force without work but available for and seeking employment (World Bank 2018). We argue that unemployment represents a significant dimension of economic insecurity that increases women's likelihood of engaging in risky sexual behaviors. This measure does not include those who work in the informal sector unless they consider themselves to be without work and are actively seeking employment. Women who work in the informal sector may also be

¹ As a robustness check, we also did engage data on HIV prevalence and incidence rates. When comparing the results presented here with models predicting total HIV incidence or prevalence, or prevalence rates among women, there were not significant findings involving these outcomes and the findings surrounding women's property

rights, women's socio-health resources, and female unemployment. Thus, this demonstrates that these relationships involving degradation, disenfranchisement, health resources and unemployment are gendered and impacts women's distinct vulnerability to HIV in comparison to men.

especially vulnerable to HIV, due to the precarious nature of their work, and although this is not the focus of this paper, it certainly represents a direction for future research.

We include GDP per capita as an indicator of economic development. We expect GDP per capita to influence many main variables, such as women's property rights and socio-health resources. GDP per capita is the total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment, and government spending, divided by the mid-year population. It is converted into current international dollars using Purchasing Power Parity (PPP) rates, which provides a standard measure allowing for cross-country comparisons of real price levels (World Bank 2018). This variable is log-transformed to correct for excessive skew.

We also control for the size of the Muslim population by including the percentage of the national population who identify Islam as their religious affiliation. This measure is obtained from the Pew Research Center's World Muslim Population by Region and Country (2013). Many previous studies at the cross-national level demonstrate that nations with large Muslim populations have a lower burden of HIV (e.g. Austin and Noble 2014; McIntosh and Thomas 2004; Gray 2004; Burroway 2010). This relationship between higher Muslim populations and lower HIV rates may be due to the particularly strict religious tenets dictating conservative sexual norms that protect against extramarital sex upheld within Islamic traditions. We further hypothesize indirect influences of Muslim affiliation on women's HIV burden, by which the same conservative gender norms restrict women's access to formal employment opportunities and health resources.

We follow prior researchers (e.g., Burroway 2012) by measuring women's property rights or legal status with three key variables: women's legal access to ownership of land, legal access to ownership of property other than land, and legal access to credit or loans. These variables come from the Gender, Institutions and Development

Database (GID-DB) from the Organisation for Economic Co-operation and Development (2014). These three indicators quantify women's effective access to three key economic resources. These variables are coded in three ordered categories, where higher values equate to greater access for women. Specifically, nations with legal equality for women and men are assigned the value of one; nations with legal equality of women compared to men but with discriminatory practices that impede access for women are assigned the value of .5; and nations in which legal restrictions or de facto discriminatory practices serve as impediments to access are given a score of zero.⁶

To capture women's socio-health resources, we utilize several measures. First, we include the percentage of women using contraceptives, as some methods of contraception such as condoms, can directly protect against HIV transmission. Furthermore, use of any contraception speaks to higher levels of reproductive autonomy or empowerment that can protect women against HIV transmission. The contraceptive use rate is the percentage of women ages 15-49 who are practicing, or whose sexual partners are practicing, any form of contraception (World Bank 2018). Second, we include secondary school enrollments for women. We utilize a gross enrollment ratio, which refers to the ratio of female educational enrollment regardless of age to the female population of the age group corresponding to secondary level education. As an additional dimension of empowerment, we incorporate the fertility rate, which is defined as the number of children a woman would be expected to have if she were to live to the end of her childbearing years. Lower fertility rates among women signify increased empowerment, and many studies have found fertility rates to be positively correlated with women's HIV rates (e.g., Noble and Austin 2014). Lastly, we consider women's access to maternal healthcare resources. We include the percentage of births attended by skilled health staff to capture women's access to medical professionals. Births attended by skilled health staff are the percent of de-

liveries attended by personnel trained to give the necessary supervision, care, and advice to women during pregnancy, labor, and the postpartum period, to conduct deliveries on their own, and to care for newborns (World Bank 2018).⁷

Given the focus on HIV/AIDS in the analysis, we also tested for the influence of ARTs or antiretroviral therapies, which can extend the life and quality of life of HIV-positive individuals and thus have a powerful influence on HIV prevalence rates. We did not find any significant influence of ARTs on the proportion of HIV cases among women in our analyses. This is likely due to the manner in which our outcome is measured, as a relative ratio of HIV/AIDS between women and men rather than a prevalence rate. The lack of significance for ARTs in the models suggests that use of such interventions is not impacting t-

he distribution of disease among men versus women.⁸

Results

Table 2 displays the correlation matrix and univariate statistics for all variables used in the analyses. The magnitude of the relationships among the variables demonstrates that many of the predictor variables are highly correlated, such as the indicators for women’s property rights (access to land, loans, property) and socio-health resources (female secondary schooling, contraceptive use, fertility rate, and percent of births attended). This further warrants the use of the SEM analytic technique given its superior handling of intercorrelated independent variables through the creation of latent constructs and direct and indirect pathways that circumvent the tendency to bias coefficient estimates (e.g., Bollen 1989).

Table 2: Correlation Matrix and Univariate Statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Percent Women’s HIV Cases	1.00											
(2) Female Unemployment Rate	0.36	1.00										
(3) Percent of Births Attended	-0.34	.19	1.00									
(4) Female Sec. School Enrollment	-0.63	-0.03	0.79	1.00								
(5) Fertility Rate	0.57	0.05	-0.65	-0.81	1.00							
(6) Percent Contraceptive Use	-0.54	-0.15	0.62	0.74	-0.78	1.00						
(7) Access / Own Property	-0.33	-0.14	0.34	0.29	-0.37	0.32	1.00					
(8) Access Bank Loans	-0.40	-0.22	0.46	0.50	-0.50	0.47	0.61	1.00				
(9) Access / Own Land	-0.50	-0.24	0.50	0.60	-0.57	0.45	0.47	0.55	1.00			
(10) GDP per capita PPP (ln)	-0.57	0.09	0.77	0.78	-0.75	0.74	0.35	0.43	0.49	1.00		
(11) Percent Muslim	0.04	0.21	-0.22	-0.24	0.27	-0.44	-0.21	-0.30	-0.21	-0.27	1.00	
(12) Biocapacity Losses	0.41	0.32	-0.13	-0.23	0.31	-0.24	-0.10	-0.01	-0.28	-0.19	0.05	1.00
Mean	44.07	10.84	70.24	61.98	3.66	44.47	-0.27	-0.29	-0.37	8.33	0.28	0.45
SD	14.96	8.55	26.05	26.67	1.61	22.18	0.30	0.29	0.32	1.02	0.38	0.14

A preliminary step in the empirical assessment of our complete SEM was to validate empirically whether women’s property rights and socio-health resources represent latent factors that

can be appropriately estimated with access to land, loans, and property and female schooling, contraceptives, fertility rates, and births attended, respectively. To test this, we initially

constructed a confirmatory factor analysis (CFA) of these measures separately and analyzed the overall and component measures of fit.⁹ By empirical standards, we find evidence at both the component and overall model levels to validate our predictions that these indicators can be used to measure women’s property rights and socio-health status. This also fits with our substantive and theoretical interpretations of prior global health and gender stratification literatures.

Figure 1 presents the SEM results of the percent HIV cases among women. We tested all theoretically and substantively informed paths as

predicted, and then eliminated nonsignificant interrelationships, as is convention in this tradition (Byrne 2009). Each remaining pathway coefficient is statistically significant and represents the standardized regression coefficient. In addition to the path diagram in Figure 1, we provide unstandardized regression coefficients, standardized regression coefficients, and standard error estimates in Table 3. These can be interpreted just as regular regression estimates, indicating the nature and magnitude of the relationship between the variables specified.

Table 3: Regression Results for SEM Predicting Percent HIV Cases among Women

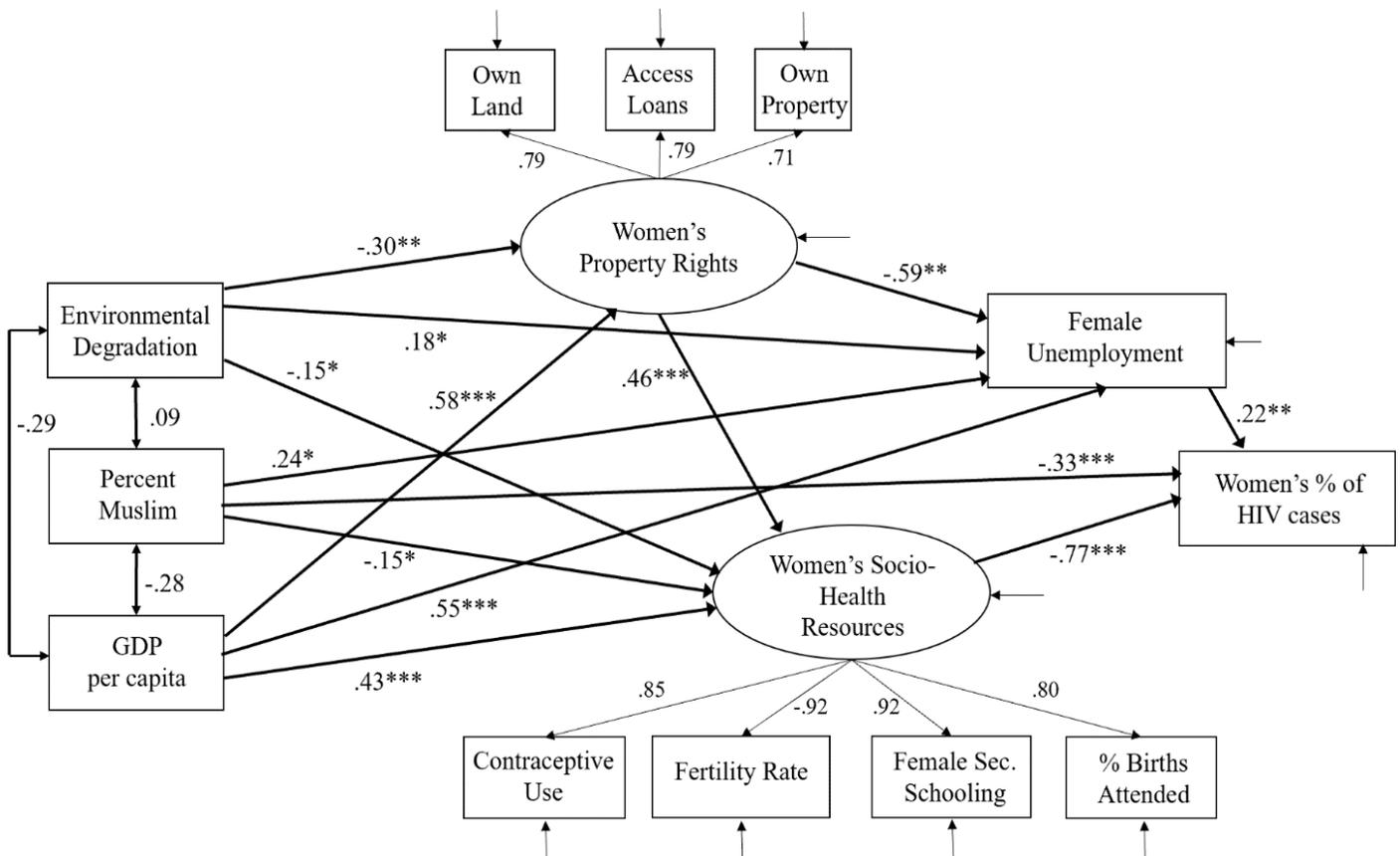
	Standardized Regression Coefficient	Unstandardized Regression Coefficient	Standard Error
Environmental Degradation → Women’s Property Rights	-.298**	-.541	.185
Environmental Degradation → Female Unemployment Rate	.178*	12.54	7.70
Environmental Degradation → Women’s Socio-Health Resources	-.153*	-15.90	8.92
Percent Muslim → Women’s Socio-health Resources	-.149*	-6.45	2.87
Percent Muslim → Women’s Proportion HIV	-.330***	-13.11	2.84
Percent Muslim → Female Unemployment Rate	-.225**	-2.668	.909
GDP per capita (ln) → Women’s Property Rights	.578***	.143	.025
GDP per capita (ln) → Female Unemployment Rate	.547***	5.23	1.50
GDP per capita (ln) → Women’s Socio-health Resources	.434***	8.07	1.65
Women’s Property Rights → Women’s Socio-Health Resources	.495***	34.49	8.49
Women’s Property Rights → Female Unemployment Rate	-.589**	-22.78	7.53
Female Unemployment Rate → Women’s Proportion HIV	.217**	.333	.118
Women’s Socio-Health Resources → Women’s Proportion HIV	-.769***	-.609	.069
Women’s Socio-Health Resources → Contraceptive Use	.855***	-	-
Women’s Socio-Health Resources → Fertility Rate	-.922***	-.078	.006
Women’s Socio-Health Resources → Female Seconadry Schooling	.916***	1.28	.109
Women’s Socio-Health Resources → Percent Births Attended	.804***	1.09	.113
Women’s Property Rights → Access Land	.789***	-	-
Women’s Property Rights → Access Loans	.790***	.897	.118
Women’s Property Rights → Access Property	.708***	.837	.124

Notes: *** p < .001, ** p < .01, * p < .05, (one-tailed tests); standardized regression coefficient flagged for statistical significance.

Before we report the results of the SEM model, it is requisite to examine the overall model fit statistics that assess the fit of our model to the data provided. In accordance with standards typical for this empirical tradition, the chi-square test statistic is nonsignificant ($\chi^2 = 51.5$ with 43 degrees of freedom), the values of the Incremental Fit Index (.987), Tucker–Lewis Index (.976), and the Confirmatory Fit Index (.987) all exceed .90,

and the root mean squared error of approximation (RMSEA) value (.04) is below the suggested threshold of .10 for smaller samples (Bollen 1989). Together, these fit indices demonstrate excellent model fit to the data and permit interpretation of the pathway coefficients, which are all statistically significant at the .05 level or better.

Figure 1: SEM Predicting Women’s Share of HIV Burden (N=105)



Notes: *** p < .001, ** p < .01, * p < .05, (one-tailed tests); standardized regression coefficient flagged for statistical significance.

Looking at the results presented in Figure 1, women’s socio-health status has the strongest direct influence on women’s share of HIV (-.77), where increased participation in secondary schooling, use of contraceptives, low fertility rates, and access to medical personnel for birthing women are associated with a lower percent of HIV among women in comparison to men. Turning attention to our key hypotheses, we find that female unemployment also has a direct impact on increasing the proportion of women with HIV (.22) in less-developed nations, even when controlling for women’s access to socio-health resources. Percent Muslim (-.33) also has a direct influence on women’s share of HIV, where nations with larger Muslim populations tend to have lower proportions of women with HIV. These findings confirm our first set of predictions and are consistent with prior research examining these factors. The results displayed in Figure 1 also illustrate the importance of women’s property rights and

environmental degradation in impacting HIV, albeit indirectly. Nations with more equal property rights tend to provide better access to socio-health resources for women (.46), such as schooling and contraceptives, which then reduce women’s vulnerability to HIV. Additionally, nations with gender-equal property rights tend to have lower rates of female unemployment (-.59), which leads to reductions in women’s proportion of HIV. In addition to the influence of property rights, we also find that environmental degradation is important in predicting several intervening factors in the model. Specifically, we find that poor nations with greater levels of ecological degradation tend to have disenfranchised property rights for women (-.30), higher levels of female unemployment (.18), and reduced access for women to socio-health resources (-.15). These findings lend support to our second set of predictions drawn from ecofeminist frameworks surrounding the importance of environmental conditions and property rights in shaping

women’s economic and social vulnerabilities to HIV.

The results presented in Figure 1 and Table 3 display a number of other important relationships. For example, we find that level of economic development or GDP per capita is positively associated with more equal property rights (.58) and increased access to socio-health resources for women (.43), thus contributing to reductions in women’s vulnerabilities to HIV. However, GDP per capita is also positively associated with female unemployment (.55), thus promoting inequalities in HIV rates between women and men. Percent Muslim also has some important indirect linkages to women’s share of HIV, including the depressing effect on women’s

access to socio-health resources (-.15) and increasing female unemployment (.24) in less-developed nations, both of which lead to greater female HIV burden.

Although the effects of many relevant predictors are indirect, these are likely to be notable, as the size or magnitude of some of the standardized coefficient for indirect parameters displayed in Figure 1 suggest. Being able to overtly compare the relative size of direct, indirect, and total effects (the combination of indirect and direct effects) of indicators on women’s HIV burden further illustrates the relevance of certain factors in explaining cross-national gendered inequalities in HIV/AIDS rates. These results are presented in Table 4 below.

Table 4: Direct, Indirect, and Total Effects on Percent HIV Cases among Women

	Direct Effects	Indirect Effects	Total Effects
Environmental Degradation		.271** <i>29.34</i>	.271** <i>29.34</i>
Percent Muslim	-.330*** <i>-13.11</i>	.151* <i>6.01</i>	-.179* <i>-7.10</i>
GDP per capita (ln)		-.494*** <i>-7.26</i>	-.494*** <i>-7.26</i>
Women’s Property Rights		-.481*** <i>-28.60</i>	-.481*** <i>-28.60</i>
Women’s Unemployment Rate	.217** <i>.333</i>		.217** <i>.333</i>
Women’s Socio-Health Resources	-.769*** <i>-.609</i>		-.769*** <i>-.609</i>

Notes: *** p < .001, ** p < .01, * p < .05 (one-tailed tests); standardized coefficients flagged for statistical significance; unstandardized coefficients reported in italics.

Comparing the size of the standardized regression coefficients in Table 4, we find that women’s socio-health resources has the largest total effect on women’s share of HIV in less-developed nations (-.769), which is accounted for entirely through its direct influence. Female unemployment rate also has a significant total and direct impact on percent of HIV cases among women (.217). Importantly, women’s property rights and

environmental degradation have indirect impacts on women’s disproportionate HIV burden, however, these are especially vital concerns given the size and significance of the total effects on women’s HIV (.481 and .271, respectively). GDP per capita also has a strong overall negative impact on women’s proportion of HIV cases (-.494). This is important to note as the indirect effects in the path diagram in Figure 1 suggest

that GDP per capita has positive associations with women's unemployment rate in less-developed nations, which increases vulnerabilities to HIV; thus despite this particular pathway, gains in economic development generally work to reduce women's HIV, largely through enhancing access to socio-health resources and rights to land and other property. Percent Muslim also had conflicting effects in the path diagram presented in Figure 1; while percent Muslim is directly associated with a decrease in women's share of HIV cases, indirect pathways through unemployment and women's socio-health resources suggest a positive impact on women's HIV. However, the results presented in Table 4 illustrate that the overall impact of percent Muslim on women's HIV cases is negative (-.179).

Taken together, the results demonstrate that women's use of socio-health resources is extremely important in reducing the proportion of HIV cases among women in poor nations. The results also illustrate the relevance of women's unemployment in facilitating disproportionately high rates of HIV among women in comparison to men. Critically, we find significant indirect effects of women's property rights and environmental degradation on women's HIV burden, pathways unexplored in prior studies. Thus, environmental and socioeconomic conditions are influential factors shaping opportunities for women which then impact their unequal risk to HIV.

Conclusions

This paper adds to ongoing discussions on the determinants of HIV for women in poor nations, as they currently represent the greatest susceptibility to transmission. While prior examinations have identified the importance of access to health resources, development, and female unemployment, our analysis goes further to broaden understanding of the upstream factors that condition these proximal causes. We find that environmental degradation is a critical facet that leads to disenfranchisement, reduced access to health resources, and unemployment, all of which are linked to greater national proportions of HIV among women. Thus, we conclude

that environmental degradation is an important and often over-looked dimension of women's health. This finding implies future investigations should consider this influential, underlying aspect of disease transmission.

Environmental degradation is linked to lower status of women, specifically their (in)ability to access loans, own land, and own property. Eco-feminists theorizations are helpful in explaining this dynamic, as they assert the destruction of nature exacerbates impoverishment and dispossession among marginalized people around the world, with women tending to lose more than men (Shiva 2016). Legacies of colonialism simultaneously siphon resources from less-developed countries and historically disfavor women in matters of access to land, eroding their traditional land use rights (Boserup 1970; Shiva 2016). The inability of women to access loans, land, and property leads to female unemployment, which exacerbates the burden of HIV among women. Prior investigations are instructive in this regard, as they demonstrate the importance of unemployment and economic insecurity in promoting unsafe sex practices to secure resources needed to sustain themselves and their households (Bandali 2011; Dunkle et al. 2004; Mabala 2011; Mojola 2011; Oyefara 2007; Stoebenau et al. 2016; Weiser et al. 2007; Wojcicki 2002). To the degree that women are afforded basic property rights, they are better positioned to secure resources in ways that do not threaten their health.

We also find that environmental degradation directly leads to unemployment among women and restricts women's access to socio-health resources. To explain these dynamics, we draw on ecofeminist assertions that environmental degradation prevents women from securing employment, education, and other health-promoting factors outside the household, as resource scarcity prolongs the search for household necessities such as food and water (Rocheleau et al. 1996). The greater amount of time allocated to such activities constricts women's ability to seek employment and health resources in addition to their traditionally assumed duties to secure

inputs of food, fuel, and fiber. Degradation often disrupts agricultural production, tourism, and craft-making, which represent prime sources of female employment in less-developed nations.

As for the latter connection to women's access to health resources, ecofeminist assertions are instructive as well. These perspectives offer that domination women and the environment are part and parcel of the current economic regime, predicting that when environmental quality suffers, so does the health and wellbeing of women (Mies and Shiva 1993). In accordance with our results, the depressing effect of environmental decline on women's access to health resources is demonstrative of the twin nature of oppression that deteriorates the health and well-being of women and the environment. Importantly, when women are given access to adequate health resources this serves as an effective check for reducing the risk of HIV among women.

Our results uncover several interesting linkages that connect development to female HIV burden in less-developed nations. On the one hand, GDP per capita or level of economic development is tied to greater access to health resources among women and enhanced property rights that, as noted above, are effective pathways to lessening the proportion of HIV among women. On the other hand, GDP per capita is associated with elevated levels of female unemployment, which directly and indirectly heighten the HIV burden for women. To better understand these connections, careful review of the raw data is instructive. Based on the nations included in our sample, those with higher GDP per capita values tend to be oil-producing nations that characteristically adhere to conservative gender norms that restrict women's employment outside the household. Also, many globalization scholars articulate that gains in economic growth in less-developed nations largely benefit men, often at the expense of opportunities for women (e.g. McMichael 2017). Thus, we speculate that the effect of GDP per capita on women's unemployment rates are, in part, due to the failure of neoliberal development strategies to distribute

gains evenly among men and women in poor nations.

Our results also point to the importance of religion in determining women's unemployment, access to health resources, and proportion of HIV. We find that predominantly Muslim nations evidence higher rates of female unemployment and lower access to health resources, both of which heighten HIV vulnerabilities among women. However, percent Muslim directly lessens HIV cases among women, which is likely due to the conservative gender norms that discourage women's engagement in extramarital and risky sex practices that are typically linked to HIV transmission. Although the overall effect of percent Muslim lessens HIV burden among women, we conclude that religion nonetheless plays a complex role in conditioning disease transmission among women. Future research is needed to uncover the exact mechanisms and conditions under which these contradictory processes operate. To that end, we advocate for qualitative and ethnographic case studies in this vein to enrich our understanding of the intricacies of these connections.

Indeed, a common weakness in all cross-national studies represents a lack of attention to or explanation of the exact mechanisms by which many of these relationships take place. For example, risky sexual behavior cannot be controlled for in such a model, but is an implicit mechanism linking unemployment to HIV. However, we draw on the rich empirical evidence emerging from relevant qualitative, ethnographic, and case-study research to inform our understanding of connections between the variables. While cross-national research cannot control for individual behaviors, a strength is in identifying the structural causes of conditions that foster such circumstances across populations. While several individual-level studies document aspects like the "sex for fish trade" example (e.g. Bandali 2011; Dunkle et al. 2004; Mabila 2011; Mojola 2011; Oyefara 2007; Weiser et al. 2007; Wojcicki 2002), here we demonstrate that linkages between degradation and women's

vulnerability to HIV are generalizable across a wide set of less-developed nations.

Another strength of this research is the use of a modeling strategy which allows for the specification of complex and mediating relationships across structural forces. The results presented here are derived using a SEM to illuminate both direct and indirect relationships. Without the flexibility of this method to accommodate mediating relationships, we could have erroneously discredited the influence of environmental degradation or disenfranchisement as factors conditioning myriad facets of women's status that influence HIV rates, for example. Therefore, we advocate future research adopt similarly versatile methods to ascertain and situate holistic understanding of the complex ways in which social, economic, political, and environmental factors coalesce to shape women's HIV burden.

Current challenges presented by ecological crises such as those associated with unsustainable production methods, burgeoning consumption, and proliferate waste generation, as well as calamities from climate-related disasters, require rigorous attention to the gendered nature of individual experiences with, perceptions of, and consequences from global environmental change. Indeed, the intersection of nationality, gender, race, class, and rurality place women in poor nations in distinctly vulnerable positions to declines in environmental quality. The tendency of women to be charged with caretaking tasks for their families, the elderly, and young children result in spillover effects for households and communities where women face rigid structures of gender inequality that prevent their ability to fulfill these duties. Empowering women in ways that improve their economic, legal, and health status are key avenues to combat the pernicious effects of environmental degradation that exacerbate HIV acquisition among women with the potential to improve overall health and sustainability of the communities in which they are embedded.

Notes

1. We also tested models with samples excluding upper-middle income nations and ex-Soviet

nations, respectively. The results of these analyses were not substantially different than those presented here, and we prefer to present findings with the largest and most inclusive sample of less-developed nations.

2. While it is possible to compute the indirect or mediating effects using regression-based methods, they are often overlooked as regression models focus only on the direct effects, potentially leaving out important parts of the story. Additionally, testing for mediating effects through sets of regressions is cumbersome; SEM presents a concise and practical framework to address these issues.

3. For some observations, there were some missing data points across the independent variables. However, the level of missing data was relatively low and there appeared to be no pattern to the missing values that would bias results. The maximum likelihood (ML) missing value estimation used here creates a likelihood for the entire sample by summing the likelihoods for each case, using whatever information each case has available. This means that each country contributes the maximum amount of information possible to the estimation (Arbuckle 1996; Enders and Bandalos 2001). The estimates are consistent and efficient under the condition that the data are missing at random (MAR). This is an easier condition to meet than missing completely at random (MCAR), which is required for methods of listwise deletion. Nonetheless, we also performed the analyses using methods of listwise deletion, on a sample of ~65 nations to confirm the reliability of the results. The results were consistent across the two samples; thus, we rule out the substantive findings are driven by sample size or the cases under investigation.

4. The agencies that collect and publish cross-national HIV estimates explicitly caution against the use of the data in longitudinal studies, as the methods to calculate HIV/AIDS cases have changed over time (UNAIDS 2013).

5. We also considered other time lags (e.g. 4-8 year lags) used in prior research for the women's HIV measure and obtained consistent results.

6. We also recoded the women's economic status variables as a dummy variable (where "legal equality" and "legal equality of women compared to men, but discriminatory practices still exist and represent impediments to access for women" are coded as 1, and "legal restrictions or de facto discriminatory practices that serve as impediments to access" are coded as 0). The results were not significantly different. We prefer to retain use of the ordinal measure to capture all three levels of economic status that may apply to women in developing nations.

7. We also tested models using a measure of physicians per 1,000. We achieved consistent results and prefer to use the births attended measure here to more appropriately capture women's access to medical care.

8. We also included a number of additional independent or control variables in our initial analyses, such as Freedom House Democracy Score, Percent Urban, Female Primary School Enrollments, Level of Foreign Debt, among others. None of these measures were found to be significant in the analyses and thus were removed for parsimony, as is requisite in the SEM tradition.

9. The model fit for the CFA for women's status are: χ^2 = non-significant; IFI = .995; TLI = .984; CFI = .954; RMSEA = .05. The model fit for the CFA of socio-health resources are: χ^2 = non-significant; IFI = .973; TLI = .934; CFI = .971; RMSEA = .06.

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