

# Prosperity, Equity, Good Governance and Good Health: Focus on HIV/AIDS Pandemic and Its Feminization

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## **Abstract**

This paper examines the association of wealth, equity and good governance in the HIV/AIDS pandemic and the feminization of this disease. A cross-country analysis was performed on adult HIV prevalence and the percentage of women among adults living with HIV/AIDS. These two indicators were significantly correlated with wealth, economic equity, gender equity and good governance. Multivariate linear regression analysis identified economic and gender equity as the two prominent factors linked with the HIV/AIDS epidemics. Gender equity, measured by the gender-related development index, emerged as the consistently significant determinant of the overall HIV epidemic and the female epidemic as well. Promoting equity, particularly gender equity, should justifiably be a primary concern of policies and programs to defeat the HIV/AIDS pandemic.

## **Introduction**

Two faces of the HIV/AIDS pandemic have been evident and are increasingly important. First, this epidemic tends to concentrate in the countries, territories or population groups that are socially, economically or politically impoverished (Farmer 1999; Mann and Tarantola 1996). On aggregate, the magnitude of the pandemic in developed regions is consistently much lower than that in developing regions. In none of the developed countries has HIV prevalence ever crossed the 1% mark (see Appendix 1). In 2005, adult HIV prevalence was less than 0.3% in the high-income countries,

except in the United States (0.8%) and Spain (0.6%). In many developing countries, HIV prevalence was above 1%. Sub-Saharan Africa has experienced the most severe epidemic. In 17 out of 44 sub-Saharan African countries for which UNAIDS (2006) produced estimates, more than 5% (up to 34%) of adults were living with HIV/AIDS in 2005.

Second, HIV infection is rising among women. The 2004 global report by UNAIDS drew attention to the speed with which HIV incidence had been rising among female populations who were normally regarded as low-risk groups (UNAIDS 2004). By 2003, 47% of all people living with HIV/AIDS were women, but in sub-Saharan Africa women accounted for more than half (57%) of people living with HIV/AIDS. In this region, 76% of young people aged 15–24 years were women. The fastest growth of HIV among women occurred in East Asia, where women living with HIV jumped by 56% in 2 years (UNAIDS 2004).

Much has been known about what determines the spread and prevention of the HIV/AIDS epidemics. Proximate measures such as promotion of condoms (Ainsworth and Teokul 2000) and clean needles (Hurley et al. 1997) have been found effective in controlling the epidemic. On the structural front, ecological analyses have pointed out that wealth, equity and good governance are fundamental to good health and a low level of AIDS (Drain et al. 2004; Mahal 2001; Menon-Johansson 2005; Over 1998; Reidpath and Allotey 2006). It has been argued that wealth, social cohesion, social capital, equity and respect for human rights are essential for avoiding massive infection and suffering from AIDS epidemics (Barnett and Whiteside 2002; Farmer 2003; Mann and Tarantola 1996). The human capability or human development approach provides a sound conceptual backing to these findings and arguments (Senn 1999).

This paper extends these works to the issue of feminization of HIV/AIDS. It examines how strongly wealth and economic equity, gender equity and governance influence the size of HIV/AIDS epidemics in general and the scale of this disease among women in particular.

### Study Design and Data

A cross-sectional ecological study was conducted, with nations as units of analysis. Keeping with the purpose of the study, two dependent variables were chosen for analysis: (1) size of HIV/AIDS epidemics at the national level as measured by adult HIV/AIDS prevalence and (2) share of females in the epidemics as measured by the proportion of adults living with HIV/AIDS who are women. Explanatory variables were (1) level of wealth as measured by gross domestic product per capita adjusted for purchasing power parity (GDP PPP), (2) economic inequality as measured by the Gini index, (3) gender equity as measured by the gender development index (GDI) value and (4) good governance as measured by the governance score. Values of the Gini index range between 0 (perfect equality) and 100 (perfect inequality). GDI values also range between 0 (minimal gender equality) and 100 (maximal gender equality). Good governance scores were reconstructed from the given database and are explained below.

A dataset was created by compiling data from three different sources. Estimates of women and adults (15+ years) living with HIV/AIDS, from which the percentage of women among HIV-positive adults was calculated, was obtained from UNAIDS (2006). Adult (15–49 years) HIV prevalence data for 2005 was also obtained from UNAIDS. Where a definite estimate of female HIV cases was unavailable, an imputed value was assigned by halving the given maximal value. The percentage of female HIV/AIDS cases for Japan was calculated from the 2003 estimates (UNAIDS 1994).

Data on GDP PPP, the Gini index and GDI were obtained from the United Nations Development Programme (UNDP) database (UNDP 2006). The good governance score was computed from the World Bank database (World Bank 2006a). This database presented data for six dimensions of governance: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. For any country, the scores for each component lay between -2.5 and +2.5. To simplify further analysis and interpretation, the six governance dimensions were reduced to a variable by using factor analysis. The first principal component, which explained 87% of the variance, was used to construct a single governance score. The scores were rescaled to fall

between 0 (poorer governance) and 100 (better governance). The explanatory variables referred to the year 2003 while the dependent variables (AIDS epidemics) pertained to the year 2005.

## Results

The analysis was performed on 100 countries for which the data were available on all variables included in this study. Table 1 presents summary information about the variables of interest and shows that there was considerable variation among the countries examined. The countries included 21 high income, 17 upper middle income, 29 lower middle income and 33 low income countries. Twenty-eight countries were from sub-Saharan Africa; 19 from northern, western and southern Europe; 18 from Latin America and the Caribbean; 17 from South, East and Southeast Asia; and the remaining 18 from other regions.

Bivariate and multivariate approaches were applied in the analysis. Roles of wealth, economic equity, gender equity and good governance are examined here in turn.

**Table 1: Description of the variables used in the analysis**

	<i>N</i>	Mean	Std. Deviation	Median	Minimum	Maximum
Adult HIV prevalence	100	2.8	6.1	0.5	<0.1	33.4
Percentage of women among HIV-positive adults	100	35.7	17.7	28.6	3.1	61.9
GDP per capita (PPP)	100	9607	10542	4961	548	37738
Gini index	100	41.1	10.6	39.3	24.7	70.7
GDI value	100	0.7	0.2	0.7	0.3	1.0
Good governance score	100	51.2	19.7	46.4	17.3	91.9

## Bivariate Analysis

Correlation coefficients ( $r$ ) were derived to examine direction, strength and significance of linear relationships between the variables included in the study (Table 2).

**Wealth:** A significant inverse relationship was found between wealth and size of the HIV/AIDS epidemics. The correlation was slightly stronger for size of the epidemic among females ( $r = -.363$ ) than the overall adult HIV prevalence ( $r = -.228$ ).

**Economic equity:** The HIV/AIDS epidemics and share of women were higher in societies with larger income gaps. The Gini index, a measure of income inequality, was significantly associated with adult HIV prevalence and share of women in adult HIV/AIDS cases. Economic inequality showed a slightly stronger relationship with overall epidemic ( $r = .524$ ) than with female epidemic ( $r = .409$ ). Comparatively, income inequality rather than level of wealth was a stronger correlate of the epidemic.

**Gender equity:** Gender equity was measured by the GDI (gender-related development index), which adjusts for gender disparities in three basic categories – income, longevity and education (UNDP 2006). As expected, gender equity is inversely associated with the overall prevalence ( $r = -.415$ ) and the female share of the epidemic ( $r = -.640$ ). The strength of the relationship matched that shown by the Gini index.

**Governance:** Correlation coefficients show that the better the governance, the smaller the HIV/AIDS epidemics. However, among the four explanatory variables considered, governance score appeared to have an insignificant, and the weakest, relationship with adult HIV prevalence ( $r = -.181$ ). But its correlation was significant and slightly stronger with the proportion of HIV-positive

adults who are women ( $r = -.309$ ). These observations warrant further examination and will be revisited in the discussion section.

Additional information available in Table 2 merits attention. Extent of female HIV epidemic shows a significant and strong positive relationship with the overall epidemic. Also, though governance was rather weakly correlated with size of the epidemic, it showed a strong relationship with GDP per capita and GDI. Likewise, GDI and GDP per capita were strongly correlated. This additional information was taken into account in the multivariate analysis.

**Table 2: Correlation between the variables that were examined**

	Adult HIV Prevalence	Percentage Of Women Among HIV-Positive Adults	Per Capita Income (GDP PPP)	Gini Index	Gender Development Index Value	Good Governance Score
Adult HIV prevalence	1					
Percentage of women among HIV-positive adults	0.527**	1				
GDP per capita (PPP)	-0.228*	-0.363**	1			
Gini index	0.524**	0.409**	-0.432**	1		
Gender development index value	-0.415**	-0.640**	0.791**	-0.406**	1	
Good governance score	-0.181	-0.309**	0.884**	-0.342**	0.742**	1

\*\* Significant at the .01 level , \* Significant at the .05 level.

### Multivariate Analysis

Two sets of multivariate linear regressions were conducted (Table 3). In the first set, the dependent variable was adult HIV prevalence, and in the second set, percentage of women among HIV-positive adults.

In the first set of regression models, Gini index and GDI were included, and both these variables were significant predictors of adult HIV prevalence. Gini index was stronger than GDI and better explained the model as indicated by higher values of  $R^2$  (Models 1–3). The second set of regression models showed that GDI and adult HIV prevalence were the two significant predictors of the share of females in the HIV epidemics (Models 4–7). When adult HIV prevalence was included in the model, GDI remained a significant predictor but Gini index was no longer significant (Model 7), although it was significant independently (Model 4). GDP per capita and good governance score were not included in the regression analysis because of their strong correlation with GDI.

### Discussion

The analysis shows that good governance and wealth are important, but economic and gender equity are much more important factors in determining the overall level and feminization of the HIV/AIDS pandemic. More precisely, gender equity appears to be a consistently significant correlate of both the HIV/AIDS pandemic and its female face.

A few issues underlying the strength and limitations of this analysis must be discussed. The data on HIV/AIDS epidemics are arguably the best estimates ever, because the database and methods have improved substantially over the years and uncertainty surrounding the estimates has been

reduced (Morgan et al. 2006). This strengthens the credibility of the findings from this study over the previous cross-country analyses. However, sex-segregated estimates were unavailable for many countries. This was an important drawback that compelled the analysis to reduce the number of countries examined. A lack of comparable sex-segregated data also constrained a time-series analysis of the epidemic and its feminization. Since this epidemic, like many other health problems, is shaped by complex biosocial processes, the findings of this study can be indicative rather than predictive and are helpful to advance discussion on the emerging patterns of the HIV pandemic. Yet the countries represent all regions, income groups and epidemic phases, and thus findings can reasonably be generalized and are also in harmony with the previous, similar studies.

**Table 3: Linear regression models explaining the HIV/AIDS epidemics**

Explanatory Variables	Dependent Variables and Standardized Coefficients			
<b>Set 1</b>	<b>Adult HIV Prevalence</b>			
	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	
Gini index	.524**		.425**	
GDI value		-.415**	-.242**	
Adjusted R <sup>2</sup>	.267	.164	.309	
<b>Set 2</b>	<b>Women among HIV-Positive Adults</b>			
	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>	<b>Model 7</b>
Gini index	.409**		.178*	.053
GDI value		-.640**	-.567**	-.496**
Adult HIV prevalence				.293**
Adjusted R <sup>2</sup>	.158	.403	.424	.478

\*\* Significant at .01 level, \* Significant at .05 level.

That governance is weakly correlated with the HIV/AIDS epidemic is in agreement with the previous findings (Menon-Johansson 2005; Reidpath and Allotey 2006). This is not surprising, because governance is a grand foundational force influencing and influenced by a range of social processes and institutions, and works indirectly through other components to influence the size and course of the HIV/AIDS epidemics. This was implied by the strong correlations found among governance scores, GDP per capita and GDI. Future analytical work may conduct a path analysis to identify the pathways through which governance influences this epidemic.

The finding that higher inequality is independently associated with the size of the epidemic agrees with the past ecological analysis conducted among developing countries (Drain et al 2004). The present analysis, however, includes both the developed and developing countries. Inclusion of both types of countries provides an opportunity to examine the nature of the pandemic at the global level. Likewise, previous studies found that societies with a higher human development index had smaller HIV epidemics (Mahal 2001), and those with higher economic inequality experienced larger epidemics (Over 1998). Present research adds the finding that gender equity is another important underlying factor – be it the overall HIV epidemic or the female epidemic.

The relationship of wealth, as measured by GDP per capita, and HIV epidemic, remains as an

issue for further in-depth analysis. A lower GDP per capita does not necessarily increase the risk of HIV, nor can a higher per capita income guarantee protection. Perhaps there may be an income threshold – somewhere at \$10,000–\$15,000 GDP per capita – beyond which the epidemic stays small (as indicated by a scatter plot not shown here). This possibility is implied by the cases of Botswana and South Africa, which are moderately wealthy but high-epidemic countries. Per capita income was \$8,714 in Botswana and \$10,346 in South Africa in 2003 (UNDP 2006). In these countries, adult HIV prevalence was 24.1% and 18.8%, respectively, in 2005 (UNAIDS 2006). These countries have moderately high wealth but inequality is also high. The Gini index is 63 in Botswana and 57.8 in South Africa (UNDP 2006). Yet economic inequality may not be the only defining factor. Besides extreme economic inequality, argue Barnett and Whiteside (2002), weak social cohesion could be responsible for unusually large HIV/AIDS epidemics in these countries. Gender inequality could be one among various social inequalities influencing the HIV/AIDS epidemics and their feminization.

Share of women in the HIV epidemic is higher where the epidemic is larger. Female HIV epidemic is also influenced by the type of transmission routes; a high proportion of female cases exist in settings where heterosexual transmission is dominant. Also, a clear relationship between deprivation and HIV transmission can be found across the world. Usually, heterosexual transmission is dominant in countries or territories that are lagging behind in terms of economic and social progress. Most of these are located in sub-Saharan Africa and some are in Latin America, the Caribbean (e.g., Haiti) and Asia-Pacific (e.g., Papua New Guinea). In contrast, in high-income regions and countries such as western Europe, Japan, Australia and the United Kingdom, HIV is mainly confined to male homosexuals and in some cases is found among injecting drug users. The female HIV epidemic is very low in these societies. In the transitional or developing countries of Asia and eastern Europe, HIV is spreading through multiple routes such as injecting drug use, commercial sexual relations, other heterosexual relations and male-to-male sex (Grassly and Garnet 2005; Monitoring the AIDS Pandemic Network 2004). The HIV epidemic is expanding in these populations in terms of overall size and female face.

How does equity, particularly gender equity, prevent large-scale HIV/AIDS epidemics? This should work by modifying the proximate factors such as sexual behaviours, injecting drug use and invasive procedures (e.g., medical injections and the like). Even in the advanced economies, activities such as injecting drug use are high and perhaps even higher than in economically impoverished countries (Aceijas et al. 2004: Tables 1 and 2). But the difference between prosperous and impoverished countries is that the former may afford a wider range of preventive measures than the latter. This gap is largely due to differences in capacities of healthcare systems and investment in health and welfare. A strong healthcare system can arrange for an effective supply of preventive measures, including condoms and needles. But the use of such methods ultimately depends on individuals. In an equitable society, sex partners can, for example, negotiate safer sex and thus prevent unsafe heterosexual networking and ultimately a large scale HIV epidemic.

Then, what about the HIV/AIDS epidemics in the developed societies? The epidemics are low but not nil. The United States provides abundant examples of the relationship between inequality and HIV/AIDS in the developed settings. Holtgrave and Crosby (2003) found that income inequality and social capital were strongly correlated with AIDS case rates at the state level. Among races, African-Americans and Hispanic-Americans have been disproportionately affected by the disease (UNAIDS 2006). African-Americans, who make up 13% of the US population, account for 50% of people living with HIV/AIDS (US Centers for Disease Control and Prevention). The effect was more pronounced among women than men. Information gathered during 2001–2004 from 33 states showed that African-American women accounted for more than two thirds (68%) of new female HIV/AIDS cases, and African-American men accounted for 44% of new male cases (US Centers for Disease Control and Prevention). The disadvantaged segments of any society seem to be bearing the most severe brunt of this disease, even if the overall epidemic is small.

Stating it succinctly, good governance builds on and enhances equity, and equity reduces unsafe

exposure to the epidemic. A well-governed, prosperous society is better positioned to ensure social and economic equity and tackle health problems, including HIV/AIDS. Social development, equity and justice, which provide a strong foundation for the good health of a population (Caldwell 1986; Wilkinson 2005), can also contribute to preventing the growth and impact of the AIDS epidemic. Enhancing economic and gender equity are justifiably relevant and essential steps toward defeating the pandemic.

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#### Appendix 1: Classification of countries examined according to income level and HIV prevalence

Income Level	HIV Prevalence			
	Less than 0.5%	0.5 to <1%	1 to Less than 5%	5% or Above
High	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Japan, Korea South, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom	Italy, Spain, United States		
Upper middle	Chile, Costa Rica, Czech Republic, Hungary, Lithuania, Malaysia, Mexico, Poland, Uruguay	Argentina, Latvia, Panama, Venezuela	Estonia, Trinidad and Tobago	Botswana, South Africa
Lower middle	Algeria, Armenia, Azerbaijan, Belarus, Bolivia, China, Indonesia, Iran, Jamaica, Kazakhstan, Morocco, Nicaragua, Paraguay, Philippines, Sri Lanka, Tunisia	Brazil, Colombia, El Salvador, Guatemala, Peru	Dominican Republic, Moldova, Thailand, Ukraine	Cameroon, Lesotho, Namibia, Swaziland
Low	Bangladesh, Laos, Mongolia, Pakistan, Tajikistan, Uzbekistan	India, Madagascar, Mauritania, Nepal, Senegal, Vietnam,	Burkina Faso, Burundi, Cambodia, Ethiopia, Gambia, Ghana, Guinea-Bissau, Mali, Niger, Nigeria, Papua New Guinea, Rwanda, Sierra Leone	Ivory Coast, Kenya, Malawi, Mozambique, Tanzania, Uganda, Zambia, Zimbabwe

Sources: UNAIDS (2006), World Bank (2006b).

Note. HIV prevalence was expressed to two decimal points; a slightly different list may be obtained for the first two columns if the prevalence is rounded off to one decimal point.