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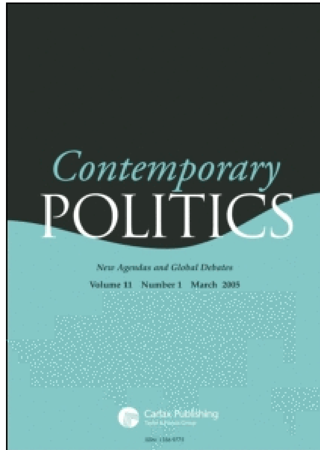

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HIV/AIDS in Africa: explaining the differences in HIV prevalence rates

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Recent research

HIV/AIDS in Africa: explaining the differences in HIV prevalence rates

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'We are standing on the brink of a global crisis in infectious diseases. No country is safe from them. No country can any longer afford to ignore their threat.' These words, attributed to the director general of the World Health Organization, Dr Hiroshi Nakajima, portray the increasing global threat of diseases that now cut across political, economic, and technological boundaries.[1] Causing over 17 million deaths worldwide, diseases like AIDS, tuberculosis, and malaria are responsible for approximately one-third of all deaths.[2] The problem is worsening as some diseases, once almost eliminated by antibiotics, have mutated and become drug resistant[3] and new illnesses have emerged that have no treatment, cure or vaccine.[4]

Despite their magnitude and severity, diseases are not the focus of most political scientists. In fact, aside from a handful of scholars,[5] the discipline of political science has remained 'shockingly silent' on important topics such as these.[6] However, this is quite surprising considering that diseases may influence the international system as much as does conflict or war. Traversing boundaries of class, race, gender, and sexual orientation, diseases not only threaten and steal the lives of millions of individuals each year but also affect the economic, political, and military well-being of nations and states.[7]

Epidemics have been the determining factor in many conflicts and partially account for the current global distribution of power and wealth.[8] Additionally, like the current epidemic of malaria in Africa, diseases may cripple a country's economy[9] by inhibiting labour productivity, deterring foreign investment, travel, and tourism, and gnawing away at household and state budgets.[10] As viruses and the effects of diseases do not hold passports[11] and they do not stop at international boundaries, with increasing global interconnectedness the devastation of one nation can affect others. Owing to the scope, magnitude, and long-term effects of illnesses on the world's economy, politics, and demography, political scientists should not pass by the opportunity to study diseases.

Among the current host of illnesses a particularly disastrous epidemic, the Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome

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(HIV/AIDS) attacks the human immune system, rendering the body defenceless against opportunistic diseases. In 2006 alone, 4.5 million people were newly infected with HIV. In the same year, AIDS killed another 2.9 million, causing more death than all conflicts and wars combined. HIV/AIDS has been especially severe in Africa, the continent that has borne the brunt of the epidemic, with approximately 2.1 million deaths in 2006 (almost three-quarters of all of the AIDS deaths globally in that year).[12] Devastating many African countries politically, economically, and demographically, HIV/AIDS has become one of the greatest obstacles to development on the continent.[13] Because HIV/AIDS mainly strikes people down in their prime years, the disease erodes the economic and social bases of families, dramatically increasing the number of orphaned children in need of social safety nets, forcing a decrease in national income, labour productivity and savings rates.[14]

HIV/AIDS is also beginning to harshly impact electoral processes, power shifts, and public opinion in Africa. For example, HIV/AIDS has not only killed 'critical segments of the South African electorate' but has also led many politically interested and active—yet infected—individuals to refrain from public voting because of stigma and fear of discrimination.[15] The disease has also affected political party participation. In South Africa, for example, one of the country's leading parties, the Inkatha Freedom Party (IFP), has acknowledged the strain on party structures from AIDS deaths. Others, such as South Africa's African Christian Democratic Party, have admitted that increasing amounts of time spent officiating at funerals for AIDS victims negatively affected the party's ability to participate in weekend campaign meetings for the 2004 elections.[16]

The consequences of AIDS/HIV may still worsen. As an increasing number of people are either incapacitated by HIV/AIDS or killed by the syndrome, the epidemic is projected to reduce some African countries' labour forces by 35% by 2020[17] and to kill every fourth healthcare worker in some countries (e.g. Malawi) by 2009.[18] Additionally, as the disease and its effects may pass freely through state borders, the economic consequences of the disease are not limited to Africa alone. HIV/AIDS has become not only a major healthcare issue and one of the greatest obstacles to present and future development in Africa but also a threat to humanity in general.[19]

Despite the looming threat and social, political, and economic consequences of HIV/AIDS, only recently have political scientists begun to study the epidemic. Following the discovery of the disease in 1981, most early studies of AIDS in Africa were conducted by epidemiologists[20] and medical scholars,[21] who focused mainly on 'biomedical individualism', or the study of individual behaviour and characteristics in determining HIV risk. Additional studies by anthropologists, medical experts, sociologists, and political scientists followed, which have explored both the effects and causes of the deadly disease. Those focusing on the consequences of the disease have highlighted HIV/AIDS' devastating effect in many areas, including electoral processes,[22] the economy,[23] and overall community or national mortality rates.[24] Those centring on the investigation of causes have examined such factors as a country's gender relations,[25] government response to the disease,[26] and cultural or religious practices.[27]

Like early epidemiologists, this latter group focuses on prevention, yet has expanded the purview of AIDS causal research beyond the individual level to encompass social factors such as cultural context,[28] neighbourhood effects and

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social capital and networks,[29] as well as determinants like policy environment and legal structures,[30] demographic change,[31] militarization,[32] and structural violence and discrimination.[33]

While much AIDS literature has identified or elaborated on these multi-level variables, few scholars have focused on the important relative impact of factors. Poundstone *et al.* have noted this gap, stating that 'Clear and testable hypotheses about which aspects of the larger social environment matter in HIV/AIDS transmission and disease progression are needed, requiring theory-based model specification.'[34] Official health care organizations, such as the Public Health Agency of Canada also see the need to begin to 'distinguish between the impact of the different determinants'.[35]

Though some AIDS scholars in Africa have responded to this demand, they have primarily conducted community-, country-, or regional-level studies. Neequaye *et al.*,[36] for example, have focused on variables such as knowledge of AIDS, sexual behaviour, prostitution, and traditional medical practices to describe their influence in the spread of HIV in Ghana. Klepp *et al.* discovered a negative correlation between AIDS education and HIV prevalence in Tanzania.[37] While Clark found that early marriage significantly influences susceptibility to HIV infection, Dunkle *et al.* noted that partner violence and high levels of male control in a woman's current relationship were associated with HIV infection.[38]

In spite of these vital contributions to the study of the disease in Africa, there remains a lack of comprehensive inter-country studies that examine the relative influence of the potential causal factors on HIV prevalence in Africa. A better understanding of the effect of these factors is important for medical and political scientists alike, as it can help to identify, estimate and possibly predict the magnitude of the HIV/AIDS threat to the economic and political well-being of nations and the entire world.

With this study we seek to fill this significant literature gap by helping to further uncover the social, economic and political contexts in which HIV/AIDS survives or perishes. In addition to the contextual factors, we also control for one behavioural factor—the use of contraceptives.

In this evaluation, we will examine inter-country variation in HIV prevalence in Africa. In particular, we seek to explain why certain countries have higher rates than others. To this end we will use multiple regression analysis to measure the effect of various factors on the HIV prevalence of African countries.

Hypotheses

Among the factors potentially associated with HIV prevalence rates, seven major variables are considered in this study: a country's poverty, the status of women, the degree of democracy, fertility rates, education, the percentage of a country's population that is Muslim, and the use of contraceptives.

> H1: *The higher the poverty rate in a country, the higher the HIV prevalence in that country.*

Poverty may be 'a *major* causal factor for the scale of the AIDS epidemic' in African countries because it facilitates the transmission of the virus.[39] Poverty often raises the amount of prostitution in a state, as individuals (mainly women) are forced into commercial sex work as a means of survival. This aids the growth of an

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industry contributing significantly to the spread of HIV.[40] Additionally, poverty may provoke population shifts within a country (often rural to urban migration for employment), which fragments familial structures and social networks, leading to fewer economic opportunities and higher HIV vulnerability.[41] Scholars have found a positive correlation between HIV and poverty.[42] Gillies has concluded that globally, 'extreme poverty is associated with higher prevalence rates'.[43] Others scholars have asserted that while low wealth is neither necessary nor sufficient for an *individual* to contract HIV, it may be necessary for an *epidemic* as severe as that in parts of Africa.[44]

> H2: *The higher the status of women in a country, the lower that country's HIV prevalence.*

Social attitudes and tradition deem women to be of lower status than men in many African countries, including all sub-Saharan countries. The consequences are manifested in the significant gender inequities in access to education and levels of female literacy, higher rates of female child labour, and gender inequities in public services. As a result, it appears likely that women are not only biologically, but also socially, more vulnerable than men to HIV infection.[45] The low social and marginal economic status of women might thus be an important contributor to high-risk sexual behaviour and vulnerability to HIV infection. They may exchange sex for money or gifts in order to survive.[46] Women are also more frequently the victims of structural violence, stigma, and discrimination based on gender. This may lead to both limited life chances (e.g. low education and employment) and emotional damage, which increase women's likelihood of engaging in high-risk behaviours leading to HIV (e.g. prostitution and injection drug use).[47]

> H3: *The higher a country's level of democracy, the lower that country's HIV prevalence.*

High levels of democracy might help to slow the epidemic. One integral part of a democratic system is respect for human rights. According to Amnesty International, an open and supportive rights-based approach to HIV/AIDS is essential to ensure that all citizens enjoy full access to a means of prevention, voluntary counselling and testing, long-term sustainable treatment, care and support, and that each individual has the opportunity to live free of fear, violence and discrimination.[48] The respect for human rights and law found in a democracy might thus reduce HIV/AIDS' impact through the protection of at-risk and marginalized groups.[49] A democracy is also characterized by a fair and legal system, which can further assist in the reduction of stigma of deprived groups in society.[50] Leaders of democracies might also be more likely to combat the spread of HIV because if they ignore or deny the threat of the disease they may 'face the consequences of non-action' (e.g. being voted out of office).[51] In addition, a free press and a diversification of media outlets should contribute to the diffusion of information on AIDS, and is likely to raise awareness of HIV.

> H4: *The higher the number of children born per woman (i.e. the fertility rate), the higher the HIV prevalence.*

Female fertility, or the number of children born per woman, is also expected to correlate with HIV prevalence as HIV may be passed from an infected mother to child before, during, and after childbirth through an infant's exposure

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to infected maternal fluids.[52] In the absence of intervention, HIV-positive women have, on average, a 35% chance of transmitting the virus to their child.[53] Mother-to-child transmission accounts for the overwhelming majority of the estimated 700,000 HIV infections in children that occur every year, and in some countries (e.g. Uganda) this mode of transmission is responsible for 15–25% of all new infections.[54]

H5: *The higher the education in a country, the lower the HIV prevalence.*

The effects of education on HIV/AIDS are controversial. Some studies have revealed a positive correlation between education and HIV infection.[55] This may have been due to the fact that the higher socio-economic status and increased mobility of more highly educated individuals 'enabled encounters with a greater number and range of sexual partners'. Knowledge about the disease was fairly limited, and education rarely involved AIDS prevention programmes.[56]

However, most studies have highlighted a negative association between education and HIV. For example, a study conducted by UNAIDS found that the more schooling that youths have, the less likely they are to have casual partners and the more likely they are to use condoms.[57] Likewise, de Walque's study of Uganda reveals a new negative association between HIV prevalence and education.[58] Boler and Carroll note that this negative correlation between education and AIDS may be due not only to the increased access to information on HIV/AIDS that schooling provides young adults but also to the fact that mere participation in school delays the age of marriage and lowers the numbers of sexual partners.[59]

H6: *The higher the percentage of Muslims in a country, the lower the HIV prevalence rate.*

Of the major religions within Africa, Islam has been shown to have the strongest links to low infection rates on a regional and country-wide basis. Although the Islamic religion's allowance of polygyny and discouragement of condom use could run counter to a reduction in HIV prevalence, many scholars have found that affiliation with Islam is negatively associated with HIV prevalence. Muslims adhere to those Islamic religious tenets that restrict sexuality and decrease the likelihood of infection, including circumcision and the prohibition of extramarital affairs and alcohol consumption.[60] Gray's study supported this point in a study on 38 sub-Saharan countries, finding that 'the percentage of Muslims in a country negatively predicted HIV prevalence'.[61] He claims that both circumcision and ritual cleansing following intercourse work to lower HIV risk and thus prevalence.[62] Mbulaiteye *et al.* demonstrate that Ugandan Muslims have a significantly lower HIV prevalence than non-Muslims in the country.[63] Rakwar *et al.* highlight in a evaluation of truck drivers in Kenya that, compared with those of other religious groups (e.g. Christians and Protestants), Muslims are less likely to engage in sex with prostitutes, a behaviour which may contribute to the overall lower HIV prevalence rates of this religious group.[64]

H7: *The more people using contraceptives, the lower the HIV prevalence rate.*

HIV is most frequently transmitted through sexual intercourse, which accounts for 75–85% of the nearly 40 million infections with the human immunodeficiency virus (HIV) that have occurred so far.[65] In many African countries such as

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South Africa, where women engage in sexual practices such as 'dry sex', which dramatically increases their own risk of infection, primary prevention strategies such as the use of contraceptives remain the mainstay for control of the HIV epidemic.[66] Still widespread in some sub-Saharan countries, including Mali and Niger, polygamy may exacerbate the HIV situation. Likewise, the tendency of teenage girls to have relations with older men increases the likelihood of adolescent girls becoming pregnant and of contracting HIV.[67] As these practices are changing only slowly, widespread use of contraceptives is likely to be an effective means of protecting women and men from the virus.

Data and measures

Having presented the expected relationships between seven independent variables (poverty, women's status, degree of democracy, fertility rates, education, percentage Muslim, and contraceptive use) and a single dependent variable (HIV prevalence rates), we now turn to the operationalization of the variables. To test the effect of these independent variables on HIV prevalence we use multiple regression analysis on cross-sectional data from 43 African countries. Eleven countries (Cape Verde, Djibouti, Equatorial Guinea, Ethiopia, Liberia, Sao Tome and Principe, Seychelles, Sudan, the Western Sahara, Somalia, and the Central African Republic) were excluded from the model as a result of data unavailability. Despite the missing data, this study covers 80% of African countries and over 85% of the total population of Africa[68] and should provide some explanation for the disparity in HIV prevalence on the continent.

The independent variables

GDP per capita. GDP per capita (PPP) is introduced into the analysis as a measure of wealth. A widely used economic indicator, GDP per capita is the value of all goods and services produced domestically in one year within a particular country divided by the country's total population. This measure provides a picture of average individual wealth. The data for the variable were obtained from the United Nations Development Program Database.[69] However, the GDP factor per capita is suboptimal for the study. While GDP provides a picture of average wealth within a country, it does not capture the distribution of that wealth. Financial inequalities may be important, however, in that actual personal wealth more than average wealth may determine HIV risk and thus prevalence. For example, in a state with high wealth but also high financial inequality, only a small (and wealthy) percentage of the population might be spared from the high HIV risk associated with economic and financial poverty. The vast majority of people in this country could actually be poor, forcing many women into prostitution and exposing the population to greater HIV risk. While currently unavailable for all African countries, data on the GINI index of inequality would provide a more comprehensive measure of state-wide inequality and individual wealth than the suboptimal measure of GDP per capita, which is used in this study.

Gender related development index. The second independent variable, women's status, is operationalized using the UNDP Gender Related Development Index

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of 2006.[70] The index is calculated by accounting for equalities between men and women in three dimensions: a long and healthy life, knowledge, and a decent standard of living. The rating ranges from zero to one. Whereas a score of one stands for perfect equality between the genders, low scores highlight discrepancies in the status of men and women in society. Because it measures several dimensions of the private and public sphere of women's empowerment, the Gender Related Development Index provides a useful measure of women's position in a country and will be used as a proxy for women's status.[71]

The freedom house index. A third independent variable, the degree of democracy, is measured using the Freedom House Index 2006. This index is handy in testing the hypothesis as it measures two dimensions of democracy: political rights and civil liberties, both of which contain numerical rankings between 1 and 7 for each country. For the first category (political rights), lower scores indicate a higher degree of freedom in electoral processes, greater political participation, and a more open government. In contrast, higher scores stress the relative lack of these political rights. For the second category, a low ranking indicates the presence of a higher degree of civil liberties (e.g. freedom of expression and organization and socio-economic rights) and a high score signifies a relative lack of these liberties. While the existence of constitutional laws is factored into the measures, more emphasis is placed on the actual fulfilment of rights.[72] The index's consideration of both procedural democracy and substantive democracy is especially fitting for this study, as both the process and the product of democracy are expected to influence HIV prevalence in a country.

Fertility rates. The fourth independent variable is operationalized using the indicator of fertility rates, which measures the average number of children that would be born per woman (aged 15–49) if all women lived to the end of their childbearing years and bore children according to a given fertility rate at each age.[73] Because in about 30% of African countries women, on average, do not survive to the end of their childbearing years, the number of children in those countries will be overestimated. However, this overestimation will be quite minimal, as in many of the countries female lifespan falls only a few years short of age 49. Even in the countries with the lowest female life expectancy (i.e. Swaziland (32.62 years) and Zimbabwe (38.35 years)), women still live the majority of their childbearing years. For this reason and because the measure of births per woman provides both a depiction of population change and a more direct indicator of fertility than birth rates, the indicator of fertility rates will be used in the regression. Data for this measure were gathered from the 2006 CIA World Factbook.

Education index. The variable of education is measured using the UNDP's Education Index.[74] As a combined measure of the adult (15–49) literacy rate as well as the combined gross enrolment ratio for primary, secondary, and tertiary education, the Education Index provides a complete measure that accounts for various levels of educational attainment in a state. The index is computed in a two-step process. First, an index for adult literacy and one for combined gross

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enrolment is calculated. Second, these two indices are combined to create the Education Index, with two-thirds of the weight given to adult literacy and one-third of the weight to combined gross enrolment. High values (close to one) indicate higher levels of education and low values represent lower levels of education. The Education Index is the only available measurement tool that covers both the current state of literacy and trends in youth education and is therefore useful for this study.

Percentage muslim. The sixth independent variable that will be employed to gauge the influence of religion on HIV prevalence is the percentage of a country's population that is Muslim. The data for this variable were collected from the CIA World Factbook database.[75] Like most data on religion, this indicator may be at risk of measurement error because of the self-reported and subjective nature of the data and because adherents may differently interpret or follow Islam. However, in spite of these drawbacks, the indicator of the percentage of Muslims in a country still provides a good (and best available) measurement of the relative influence of Islam in the various countries.

Percentage of women who use contraception. This variable is introduced into the analysis as the only behavioural factor. Contraceptive prevalence refers to the percentage of women of reproductive age, married or in union, currently using contraception. The prevalence of contraception includes but is not restricted to the use of the following methods: female and male sterilization, the contraceptive pill, the intrauterine device (IUD), injectables, implants, the female and male condom, cervical cap, diaphragm, spermicidal foams, jelly, cream, sponges and emergency contraception. Data on contraceptive prevalence were gathered from the United Nations Statistical Division.[76]

The dependent variable

HIV prevalence. The dependent variable is HIV prevalence, which is measured as the percentage of the total population that is HIV-positive. The prevalence rates for each country for the year 2005 were calculated by the authors. First, we retrieved from the UNAIDS database the estimated numbers of people with HIV for each country.[77] Second, we divided this figure by the total population estimate of that country, which was established by the CIA World Factbook.[78] Other measures of HIV exist, including HIV incidence (or the percentage of the total population that contracted the disease in a particular time period (e.g. during a certain year)). These measures are often subject to underestimation, as factors such as HIV stigma and denial may deter those infected from getting tested or reporting their illness, especially during the year of infection. Because of this fact, it may be difficult to determine during exactly which time period a person became HIV-positive. Additionally, government reporting bias and lack of testing availability may skew data. While HIV prevalence may also be underestimated as a result of these factors, it is nevertheless less subject to measurement error, as it provides a *cumulative* instead of yearly estimate of those infected.

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Results

The multivariate regression model (see Table 1) accounts for a considerable proportion of the variance in national HIV prevalence ($R^2 = 0.626$). For the indicators Gender Equality Index and fertility rates the expected correlation holds. For the factor of education the correlation is opposite to that hypothesized. All other factors are not statistically significant.

Those countries that embrace more equality between the genders have significantly lower HIV prevalence than countries where gender inequalities exist. For example, Libya and Mauritius, the two countries that have the highest value (0.79) in the Gender Equality Index also have very low HIV prevalence rates of 0.1 and 0.3% of the total population, respectively. Conversely, gender equality is low in Mozambique and Zambia and the HIV prevalence is at around 10% of the whole population in both countries. The perfect correlation in the regression model supports the assumption that discrimination against women and girls is fuelling Africa's HIV/AIDS crisis. The second-class status of females makes them vulnerable to violence and unsafe sex, fuelling HIV prevalence across both genders. In the fight against HIV/AIDS it appears crucial to protect women from sexual and physical abuse and to ensure their legal rights and their equal status under the law.

Also, fertility rates are negatively and significantly correlated with HIV prevalence, which supports the proposed hypothesis that higher fertility rates would correlate with higher HIV prevalence. Countries such as Tunisia and Algeria, where women on average give birth to two children, have the lowest prevalence rates ($<0.1\%$) of the continent. In states such as Malawi or Zambia, where women normally have five or more children, the HIV prevalence rates are 8–10% of the entire population. Reducing the number of children born per woman in Africa is a major challenge. Especially in settings with high birth rates and high HIV prevalence (e.g. sub-Saharan Africa), an effective reduction in fertility rates requires changes to deep-seated traditions and social customs. These changes in behavioural norms include: abstinence and delayed sexual intercourse for young people, monogamy within relationships, and delayed marriages.

Table 1. Model 1

	B	SE	Sig.
Economic factors			
GDP per capita	3.309E-04	0.000	0.080
Political factors			
Freedom House	−0.102	0.178	0.571
Societal factors			
Fertility rates	−1.840	0.626	0.006
Education Index	19.377	7.144	0.010
% Muslim	−2.883 E-02	0.021	0.178
Gender Equality Index	−35.376	9.088	0.000
Behavioural factors			
% women that use contraception	−7.914 E-02	0.052	0.139
Constant	21.546	5.849	0.001

$R^2 = 0.626$; $N = 43$.

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Additionally, a vital component in the reduction of fertility is the empowerment of women both in the professional and family realm.

The last significant variable, education, shows a relationship opposite to that hypothesized. Surprisingly, a high education is significantly correlated with the likelihood of the occurrence of HIV on the African continent. The fact that the variable GDP per capita is also positively correlated with HIV prevalence hints that access to more human resources and a higher socio-economic status increases mobility and the exposure to more sexual partners. Some relatively rich countries with an educated populace have high HIV prevalence. South Africa exemplifies this point, as the populace is comparatively well educated and wealthy, yet its HIV prevalence rates stand at a high 12.40%. This may be, in part, due to the fact that South Africa's government did not until recently acknowledge the serious HIV/AIDS situation in the country, and did not launch educational efforts to combat the disease. President Mbeki even refused to provide HIV-infected pregnant women with the medical treatment that could prevent mother-to-child transmission of the disease.[79] However, the result of this study does not, of course, advocate that the goal of providing children with a better education should be abandoned, but instead suggests the inclusion of HIV/AIDS prevention programmes in all curricula.

The remaining three variables—the level of democracy, the percentage of Muslims, and the use of contraception—are unimportant in this study. The Freedom House measure of democracy is insignificant, possibly because instead of depending wholly on the presence of democratic political and civil liberties, HIV prevalence may also hinge on whether an executive, a governmental body, and/or the public acknowledge the threat of HIV/AIDS and carry out measures to eradicate the disease. Concerning the variable Muslim beliefs, predominantly Muslim countries do not significantly differentiate themselves with regard to HIV prevalence from populaces that predominantly embrace a different religion. Two tendencies might account for this: (1) individuals practise religion to different degrees and (2) religious tenets lose influence in the daily lives of people in Africa, as in the rest of the world.

More surprisingly, the use of contraceptives also proves to be insignificant. This might stem from the fact that on the African continent the use of contraceptives is not widespread. On average, less than 28% of the populace of Africa regularly utilizes some contraceptive method. HIV is spread, in large part, by adolescent females who represent a cohort where low contraceptive prevalence rates are reported. Moreover, contraceptives other than condoms account for a majority of contraceptive use.[80]

Conclusion

In response to the scholarly call for a theory-based model specification for HIV prevalence, this paper has offered insight into the impact of seven factors (poverty, education, female empowerment, percentage Muslim, democracy, and fertility rates, as well as contraceptive use) on HIV prevalence rates in 43 countries in Africa. This study notes that beneficial conditions for low HIV prevalence rates are a high degree of gender equality and moderate fertility rates. Both indicators are significantly correlated with HIV prevalence rates, and explain more than 46%

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of the variance in the model. Political initiatives should be geared towards these ends.

This analysis also hints that educational efforts to raise awareness of the disease must be strengthened. HIV/AIDS education must be included in the curricula, especially in rich countries, to reverse the shocking tendency that generally more educated populaces suffer considerably from the HIV/AIDS epidemic.

All other factors appear to be irrelevant in the African context. By including as many potentially relevant variables as possible into the evaluation, this analysis provides a relatively complete picture of the current state of HIV in Africa. However, comprehensive research about this disastrous virus is still in its infancy. As more data on HIV/AIDS become available, future research could include factors such as the disparity between urban and rural centres as well as international organization and/or governmental responses to the HIV/AIDS situation. Also, because of data constraints, this model was based on 2005 HIV prevalence data and provided a picture of the HIV/AIDS situation in Africa for that given point in time. However, future research could retest these hypotheses through time-series regression analysis with all 54 African countries.

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