AIDS AND VIOLENT CONFLICT:
The Indirect Effects of Disease on National Security

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The popular press, policy officials, and academic publications increasingly warn of the negative effects on national security of Acquired Immune Deficiency Syndrome (AIDS) and the human immunodeficiency virus (HIV) that causes it. Despite these increasingly vocal pleas, however, the idea that HIV/AIDS erodes national security has not become conventional wisdom within the international relations discipline. In this paper, we empirically test the link between HIV/AIDS and two aspects of national security, the severity of human rights abuses and civil conflict. Specifically, we examine the direct and indirect effects of adult HIV infection rates in 1999 and 2001 across 112 countries on the likelihood and intensity of state-imposed human rights violations and civil conflict. We find that as HIV/AIDS prevalence rates increase, so too does the severity of human rights abuses and civil conflict. HIV/AIDS has no direct impact on such abuses and civil conflict, however. Rather, it influences national security indirectly through its impact on the social, political, and economic institutions of the state.

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The popular press, policy officials, and academic publications increasingly warn of the negative effects on national security of Acquired Immune Deficiency Syndrome (AIDS) and the human immunodeficiency virus (HIV) that causes it. In January 2000, the Security Council of the United Nations (UN) met to discuss the security implications of AIDS in Africa, marking the first time in the history of that institution that it had addressed a health issue. That same month, the Central Intelligence Agency's National Intelligence Council (NIC) (2000) explored the implications of HIV/AIDS for the security of the United States. More recently, NIC (2002) turned its attention to the security consequences of "the next wave of HIV/AIDS."[1] These official pronouncements mirror the reports of private think tanks. In recent years, the International Institute for Strategic Studies (Elbe 2003), RAND (Brower and Chalk 2003), the Chemical and Biological Arms Control Institute and the Center for Strategic and International Studies (2002), the Council on Foreign Relations and the Milbank Memorial Fund (2001), and the International Crisis Group (2001) have published reports on infectious disease as a foreign policy and national security issue.

A small, but growing number of scholars (i.e., Fidler 2003; Ostergard 2002; Price-Smith 2002; Singer 2002) and journalists (Garrett 1999, 2000) join national and international officials and public health advocates in raising the alarm: HIV/AIDS threatens national security. The threat the disease poses to human security—the welfare of individuals or people collectively (Paris 2001)—should be obvious to even the most casual observers of the pandemic.[2] The recent turn to rhetoric linking HIV/AIDS and national security highlights a narrower set of consequences, the impact of the disease on the use of force (i.e., Fiddlers 2003; Ostergard 2002;

[1] The second wave includes epidemics in Nigeria, Ethiopia, Russia, India, and China.
[2] A pandemic is an outbreak of an epidemic disease that occurs over a wide geographic area, usually worldwide. If the outbreak is limited to a specific geographical region, it is referred to as an epidemic.

Peterson 2002/3; Price-Smith 2002, 2003; Price-Smith and Daly 2004). HIV/AIDS, in other words, produces significant and lethal externalities for the hardest hit societies. In addition to the more than 32 million people who already have succumbed to HIV/AIDS and the 40 million infected who, without a cure, shortly will succumb, students of the pandemic argue that HIV/AIDS will continue to claim even more lives through its role in exacerbating violent conflict (Cheek 2001; Fourie and Schönteich 2001; Price-Smith 2003).

Despite the increasingly vocal pleas of some scholars, the idea that HIV/AIDS erodes political stability and enflames conflict is not conventional wisdom within the international relations discipline. The catastrophic consequences of HIV/AIDS experienced by a handful of sub-Saharan African states has not been replicated in other states, leading some students of the pandemic to question the accuracy and usefulness of casting the pandemic largely in security terms (Peterson 2002/3). The lack of attention to HIV/AIDS in the international relations literature and particularly the security and strategic studies journals suggests that claims about the dire security threats posed by HIV/AIDS do not resonate with traditional approaches to national security.[3] More importantly, no one has systematically and empirically examined the relationship between HIV/AIDS and national security.

In this paper, we empirically test the link between HIV/AIDS and two aspects of national security, the likelihood and severity of violent conflict. Specifically, we examine the direct and indirect effects of adult HIV infection rates in 1999 and 2001 across 112 countries on the likelihood and intensity of state-imposed human rights violations and civil conflict. We find that as HIV/AIDS prevalence rates[4] increase, so too does the likelihood and severity of violent conflict. HIV/AIDS has no direct impact on conflict, however. Rather, it influences national security indirectly through its impact on a state's society, economy, and political institutions.

[3] For an early exception, see Rosen 1987.
[4] HIV/AIDS prevalence rate refers to the percentage of the population—in this case 15-49 year olds—infected with HIV and/or AIDS.

The paper proceeds in five parts. Part one briefly examines the state of the current HIV/AIDS pandemic; part two assesses the literature on the relationship between the disease and violent conflict; part three outlines the research design; and part four presents our results. Finally, the conclusion summarizes our findings, sketches the implications of those findings, and discusses avenues for further research.

I. AIDS in the World

HIV/AIDS already has surpassed in absolute terms the most notorious epidemics of earlier generations, including the Black Death of the 14th century, the smallpox epidemics that ravaged the Americas in the 16th and 17th centuries, and the 1918 influenza epidemic that claimed 25 million lives.[5] To date, more than 72 million people have been infected with HIV and/or died from AIDS, and the crisis is accelerating. Five million people were newly infected in 2004, and 3.1 million died, more than in any year since the pandemic began (UNAIDS 2004a, 1).

More frightening than all the statistics describing the pandemic is the fact that, no matter what breakthroughs medical science achieves in the coming years, we likely have witnessed only the proverbial tip of the AIDS iceberg, which is poised to claim hundreds of millions of lives in the coming decades. The HIV/AIDS pandemic, what one analyst calls "a viral holocaust" (Cheek 2001), constitutes a humanitarian and human security crisis of unimaginable proportions. Increasingly, many scholars and practitioners of international relations also warn that it constitutes a security threat.

II. AIDS and National Security

Recent literature links HIV/AIDS to violent conflict through its impact on a state's society, economy, and political institutions. The spread of HIV/AIDS does not itself cause intra-

[5] As a percentage of the population, the victims of some earlier epidemics still outnumber those from AIDS. Smallpox and other European diseases, for example, killed as many as 95 percent of North American Indians between 1492 and the late 1600s. (Joralemon 1982).

state conflict, in other words, but it contributes to social, economic, and political instability and even state failure, which in turn can produce or aggravate violent conflict.[6]

Much of the existing literature on HIV/AIDS and security focuses on the first part of this argument, that the pandemic is having grave social, political, and economic consequences in countries with high HIV prevalence rates.[7] In many states, particularly in sub-Saharan Africa, HIV/AIDS is devastating all levels of the economy. The United Nations Development Programme (UNDP 2001) estimates that AIDS lowers the income of affected households by 80 percent, and food consumption drops 15-30 percent. Because AIDS is spread largely by sexual behavior, it strikes people in their economically most productive years, ravaging local and national economies. By the end of 2001, a UN Food and Agriculture Organization study estimated, AIDS had claimed 26 percent of the agricultural work force in the ten most affected African nations (ICG 2001, 11). AIDS lowers productivity and produces labor shortages in all economic sectors, but it disproportionately attacks the middle and professional classes—including teachers, scientists, technicians, and managers. By 2010, there will be 71 million fewer people in South Africa because of AIDS (UNDP 2001, 7). Soon, there will be more adults in their 60s and 70s than in their 40s or 50s in the hardest hit societies because of AIDS deaths (UNAIDS 2000, 21-26). In a high prevalence country like South Africa, GDP will be 17 percent lower in 2010 with AIDS than it would have been without it. Even after accounting for AIDS-induced population decline, per capita GDP in South Africa will be 8 percent lower in 2010 with AIDS than without it (Arndt and Lewis 2000).

AIDS also threatens the social fabric of the hardest hit nations, destroying families, as well as the educational system. It has become commonplace to note that AIDS is producing a generation of orphans: As many as 11 percent of children in some African states had lost one or

[6] For other mechanisms by which epidemic disease might produce conflict, see Peterson 2002/3.

[7] This section draws on Peterson 2002/3. The literature on HIV/AIDS and security argues that the disease erodes the social, economic, and political foundations of a nation. It is possible or even probable, however, that the causal arrow points in the opposite direction: social, economic, and political decay increases AIDS prevalence rates, not the other way around. See, for example, Poku 2002; and Whiteside 2001. In the research design section below, we consider this possibility and model the potential endogenous relationship between AIDS and a state's social, economic, and political environment.

both parents by 1997, compared with about 2 percent before the AIDS era. At least one-third of children orphaned by AIDS, it is estimated, drop out of school (UNDP 2001, 9). At the same time, the disease also depletes the supply of teachers. In South Africa, up to one-third of teachers are HIV positive. In Zambia, the number is 40 percent, and in Swaziland, 70 percent (ICG 2001, 16). A recent World Bank study of Malawi asserts that roughly 40 percent of education personnel in that country will die from AIDS (Cohen 1999a). Overall, the International Crisis Group (2001, 16) estimated, Africa would lose 10 percent of its educators to AIDS by 2005, setting the continent back a century in education levels.

Finally, the HIV/AIDS pandemic contributes to the breakdown of the state by undermining the ability of the state to govern. AIDS literally destroys political institutions by gutting them of their personnel. In September 2000, Zimbabwean President Robert Mugabe announced that AIDS had killed three of his cabinet ministers, as well as many traditional tribal chiefs (Pan African News 2000). Eighty-six percent of all employee deaths at the Kenya Revenue authority in 1998 and 75 percent of all police deaths in 1996-98 were AIDS related (ICG 2001, 14-15). More than one-fourth of South African police forces are thought to be infected with HIV (Price-Smith 2003, 24), and the disease is bringing the courts and local governments to a halt in some parts of sub-Saharan Africa (Cohen 1999b).

Much of the existing research on AIDS and national security draws our attention to the pandemic's grim economic, social, and political consequences. Increasingly, however, scholars also explore the specific ways in which the AIDS-induced breakdown of the state produces or intensifies violent conflict. At least three causal mechanisms emerge.

First, by exacerbating economic inequality and deprivation, AIDS may trigger or intensify violent conflict. One of the most prominent students of the link between infectious disease and national security, Andrew T. Price-Smith, echoes Ted Robert Gurr's (1970) famous explanation for "why men rebel." Price-Smith argues that infectious diseases like AIDS "magnify . . . both relative and absolute deprivation and . . . hasten the erosion of state capacity

in seriously affected societies. Thus, infectious disease may in fact contribute to societal destabilization and to chronic low-intensity intra-state violence, and in extreme cases it may accelerate the processes that lead to state failure" (Price-Smith 2002, 121). If the debilitating and deadly effects of HIV/AIDS are concentrated among a particular socio-economic, ethnic, racial, or geographic group, the potential for conflict escalates. Competition over access to scarce anti-retroviral medications will only intensify this effect. In most parts of sub-Saharan Africa today, treatment programs for HIV/AIDS are limited to urban areas. If access to life-saving treatments are based or perceived to be based on geography, skill, education, ethnicity, religion, political loyalty, or other factors, HIV/AIDS is far more likely to produce mass conflict (Cheek 2001). As Price-Smith (2002, 124) argues, moreover, "The potential for intra-elite violence is also increasingly probable and may carry grave political consequences, such as coups, the collapse of governance, and planned genocides."

Second, the AIDS-induced breakdown of social institutions like the family and education also carries the potential for violent conflict (Fourie and Schönteich 2001). As the number of AIDS orphans grows, particularly in societies where criminal opportunities and weapons are readily available, so too will the level of violent crime and the potential for other forms of conflict. Orphans are a vulnerable group, members of which easily may be recruited into armies, gangs, or crime with promises of food, alcohol, drugs, or the security of a "family." As Stefan Elbe (2003, 57) writes, the role of AIDS orphans in producing violent conflict "is part of a larger historical correlation between the outbreak of civil unrest and the presence of a large number of discontented young people."

Finally, the erosion of democratic political institutions and state bureaucracies weakens the ability of the state to manage conflict. The depletion by HIV/AIDS of the ranks of civil servants, lawyers, and other professional groups undermines the capacity of the state to govern effectively, while the devastation of police and military forces and the recruitment pool for these groups limits the state's ability to control unrest. More importantly, in the hardest hit nations, if

the government's response to the pandemic is perceived to be ineffective, HIV/AIDS can threaten the regime's legitimacy. "These attitudes can contribute to the eruption of violence, not just spontaneously, but in some cases as the result of exploitation by ethnic, religious or national elites to serve their narrow interests" (Fourie and Scotch 2001).

Recent literature on HIV/AIDS and national security is littered with implicit and explicit hypotheses about the relationship between the pandemic and the outbreak or intensification of violent conflict. To date, however, the arguments discussed above are relatively underdeveloped and the evidence for them is largely anecdotal. There has been no systematic attempt to test the argument that HIV/AIDS increases conflict.[8] In the model developed below, we seek to fill this gap by examining the indirect effects of HIV/AIDS on conflict.

III. Research Design

We depict our causal model in Figure 1. Models simplify reality by highlighting key causal mechanisms and filtering out extraneous factors. Thus, the model cannot capture all the aspects that affect a state's security. Our model can shed light, however, on some particular mechanisms at work in conflict processes.

[Insert Figure 1 about here]

Figure 1 illustrates our core argument that AIDS leads to the breakdown of a state's society, economy, and political institutions and thus degrades what we call a country's *Social-economic-political (SEP) status*. It is common for political psychologists and others to measure an individual's socio-economic status based on his or her education and income levels. We add political institutions to the mix, and create a similar indicator to measure a country's as opposed to an individual's socio-economic-political status. *SEP status*, in other words, is a composite measure of a country's social conditions, economic prosperity, and political institutions. As AIDS erodes a country's *SEP status*, the propensity for civil conflict and human rights abuse

[8] For an important attempt to examine the link between HIV/AIDS and conflict in a single case study, see Price-Smith and Daly 2004.

increases.[9] In short, our model posits that AIDS indirectly causes conflict by eroding a state's society, economy, and political institutions.

Reverse Causality?

Our argument posits that AIDS erodes a country's *SEP status*, but it is logically possible, indeed likely, that the causal arrow points in the opposite direction: *SEP status* influences *AIDS prevalence rates*. Since the epidemic's earliest days, students and practitioners have recognized the relationship between malnutrition, caused by poverty, and the spread of HIV/AIDS ("AIDS" 1994). Numerous students of the epidemic argue that the high levels of poverty within a society undermine public health in general and contribute to the quick and extensive spread of HIV/AIDS in particular by limiting access to health care, creating malnutrition, and compelling women to enter the commercial sex trade (Barnett and Whiteside 1999; Parker 2002; Poku 2002; Whiteside 2001). Others hypothesize that a lack of democratic institutions, including respect for women's rights and free speech, facilitate the spread of the disease (Fourie and Schonteich 2001). Similarly, countries with weak educational systems and those in which students drop out at young ages create few opportunities for effective HIV education. Wealthier, more democratic, and more educated countries are better able to respond to the epidemic, because they provide more universal access to better health care, afford fewer incentives to engage in commercial sex work, provide more extensive HIV/AIDS education, and enjoy greater legitimacy for their policies than poorer, less democratic, and less educated countries .

We include a dotted line in Figure 1 to account for possible reciprocal causation between AIDS and *SEP status*.

To model such reverse causality econometrically, we must include a variable in our model that affects *AIDS* but not *SEP status*. We believe that the extent of *Religious fractionalization* within a country should affect *AIDS* but not *SEP status*. Religious

[9] Similar arguments about socioeconomic status and "why men rebel" are used to explain an individual's participation in and the intensity of violent conflict (Gurr 1970).

fractionalization has not been shown to affect wealth, democracy, and education, but religion has long been thought to be correlated with HIV/AIDS rates. That said, empirical studies suggest that the relationship is a complex one. Some studies (i.e., Abebe et al 2000; Drain et al 2004) suggest that Muslims are less likely to become infected with HIV, while others (i.e., Lawoyin and Aderwole 2004) claim that Christians have a lower risk of infection. Other students of the epidemic claim that religious affiliation and religiosity, rather than the specific religion of subjects, explains lower prevalence rates (Hasnain et al 2005), perception of risk of infection (Largarde et al 2000; Prohaska et al 1990), and knowledge of AIDS (Takyi 2003). At the same time, however, religiosity does not seem to translate into an increase in specific protective behavior (Takyi 2003).

This theoretical and empirical morass suggests that religion may function on a social rather than an individual level and that it may function differently in different societies. Where one religion dominates and sets the moral (and sometimes legal) code for a nation, HIV/AIDS prevalence rates should be lower. The greater the degree of religious fractionalization, in contrast, the higher the HIV/AIDS prevalence rate should be. We include a dotted line in Figure 1 from *Religious fractionalization* to *AIDS* to account for such a relationship. Following our description of our indicators, we describe our estimation strategy for our system of equations.

Data

We systematically test the argument that AIDS indirectly causes conflict by eroding a state's social, economic, and political conditions with aggregate data for 112 countries over two years, 1999 and 2001. As such, our unit of analysis is the country-year. We append a list of countries included in our estimation sample. This list comprises the countries for which we have data for at least one of our two years (1999 or 2001). Given our unbalanced panel, we are able to say more about spatial variation than about temporal variation.

The first stage of our argument claims that AIDS erodes a state's *SEP status*. To test this argument, we identify measures that capture each of the component parts—society, economy, and political institutions—and combine them in a way that reflects a country's overall *SEP status*. To measure a state's economy we use *Gross Domestic Product* (GDP) data available from the 2004 World Bank Development Indicators database. To proxy a state's societal status, we utilize S*econdary education enrollment* (percent net) from the same World Bank database. Finally, to capture the quality of a state's political institutions, we use a typical measure of *Democracy* (e.g. democracy score – autocracy score) from the Polity IV project. We then create a composite measure from the three component variables using a factor analysis method.[10]

Specifically, we use principal component analysis to find a small number of common factors that linearly reconstruct our three original variables. The "reconstruction" is defined in terms of predicting the covariance matrix of the original variables. The extraction of principal components maximizes the variance rotation of the original three-dimensional space. After we fit the first plane to the data, we fit a second plane that maximizes the remaining variability, a third, and so on. We then examine the variances extracted by the factors, the eigenvalues, to decide how many factors to retain. The eigenvalues associated with each factor appear in Table 1. Using the Kaiser (1960) criterion, we only retain factors that extract at least as much as the

[10] One alternative to creating a composite measure is to model GDP, education, and democracy in separate equations. The main problem with this approach is that all the variables are correlated with one another, and any analyses would need to take into account the endogenous relationships among the three variables (See Lipset, Seong, and Torres 1993; and Lipset 1959). This would produce a nonrecursive model and one would then need to identify relevant instrumental variables for each dependent variable. Identifying the model in order to estimate it without bias and with efficiency is problematic. In any case, the logic of our argument leads us to measure the composite social, economic, and political status of a country. Our approach is consistent with many other studies in the literature that face this issue. Public opinion studies, for example, often create a composite indicator for socioeconomic status that captures more than one variable, such as occupational prestige, income, number of items owned by families/households, and/or education levels (e.g., Nelson 1979; Sharp 1982; Canache 1995). To check the robustness of our results, we ran separate regressions for each component variable controlling for the others as well as for our modernization variables. In each equation, the *AIDS prevalence* coefficient was negative and statistically significant.

equivalent of one original variable (i.e., an eigenvalue = 1.0).[11] With these data, we retain only the first factor.[12]

[Insert Table 1 about here]

To internally validate our new measure, we display the correlation matrix among our component variables and our new composite indicator, *SEP status*, in Table 2. Each component variable is positively associated with the other components and with the new composite measure. These consistent associations suggest that our composite measure is internally valid (Manheim & Rich 1995, 75-6). Of the components, *Democracy* is the most highly correlated with *SEP status*, but *Education* and *GDP* are both 0.5 or above. To demonstrate external construct validity, we also correlate our composite and component variables with *AIDS prevalence* rates in Table 2. The data in Table 2 provide preliminary evidence that our variable *AIDS prevalence* rates is statistically significant and negatively associated with each of the component variables as well as our new composite measure, *SEP status*. Information on HIV/AIDS prevalence rates come from the United Nations Joint Programme on AIDS and represent the most consistent and reliable data available. They measure the percentage of 15-49 year olds within each country infected with HIV and/ or AIDS (UNAIDS 2004b, 189-92). The consistent negative correlation among our component measures and *AIDS prevalence* and between our composite measure and *AIDS prevalence* demonstrates that our measure is externally valid. In other words, it produces the kind of relationship with *AIDS prevalence* that we expect and is consistent with the correlation coefficients we observe among AIDS and each of our component variables.[13] Given that our composite measure performs well on our tests for internal and external construct validity, we feel it captures our concept of socio-economic-political status well.

[Insert Table 2 about here]

[11] This criterion is the most widely used to make decisions on retaining factors.
[12] We orthogonally rotated the factors and found no differences with respect to the eigenvalues. We also employed various methods to factor analyze our components (e.g., maximum likelihood, iterative principal components, etc.), but all consistently retained one factor based on the Kaiser (1960) criterion. All created composite measures were highly correlated with one another.
[13] See Manheim and Rich (1995, 74) for a detailed discussion of internal and external construct validity.

In the first stage of our model, we control for the effects of modernization on a country's *SEP status* while testing our key AIDS hypothesis. Rueschemeyer, Stephens, and Stephens (1992) argue that a shift from an agrarian society towards industrialization and capitalist development furthers the growth of civil society, increases urbanization, improves communication and transportation, and increases education. Industrialization essentially leads to modern values and generates a push towards more democratic institutions, which provide the rule of law, civil liberties, and freedoms to a state's citizens (Przeworski and Limongi 1997).

We capture the industrialization process by measuring a country's annual manufacturing output. We use the "manufacturing, value added (% of GDP)" variable from the World Bank Development Indicators database. We expect that *Manufacturing output* will have a positive and statistically significant impact on *SEP status*. In contrast, agrarian based economies should be lower on the *SEP status* index. We capture this concept by measuring *Agricultural output* obtained from the same World Bank database. Finally, to capture the urbanization process associated with modernization, we use the *Urban population* variable from the Correlates of War capabilities data. We expect the estimated coefficient on *Urban population* to be positive and statistically significant.

In the second stage of our model, we analyze the effects of *SEP status* on a core element of national security, the likelihood and severity of violent conflict within a society. In particular, we examine the effects of *SEP status* on the presence and intensity of civil conflict and human rights abuses. The *Civil conflict* variable comes from the Armed Conflict Dataset (Type3). It is an ordinal ranking of the intensity of armed conflict ranging from 0 (no internal conflict) to 1 (minor internal armed conflict) to 2 (intermediate internal armed conflict) to 3 (internal war).[14] We measure *Human rights abuses* with Gibney and Dalton's (1996) Political Terror Scale (PTS). The PTS variable is a standards-based measure of the intensity and scope of violations coded on a

[14] See Strand, Håvard, Wilhelmsen, Gleditsch, and Mikael Eriksson (2004).

5-point scale.[15] Higher values are associated with greater levels of violation. The data are content-analyzed from two text sources: Amnesty International annual reports and the U.S. Department of State's annual reports on human rights. We report the findings using the State Department Indicator and note that the effects are consistent with the Amnesty International variable. We first create dichotomous variables measuring the presence or absence of civil conflict and the presence or absence of human rights abuses. The dichotomous civil war variable is coded 1 if the ordinal civil war variable is greater than zero and 0 otherwise. The dichotomous PTS variable is coded 1 if the ordinal PTS variable is greater than one and 0 otherwise.

We base our model of civil war on a synthesis of influential civil war models (e.g., Collier and Hoeffler 1998; Sambanis 2001; Elbadawi and Sambanis 2002), and we base our human rights model on work by Mitchell and McCormick (1988), Henderson (1991), and Poe and Tate (1994). With respect to civil war, Collier and Hoeffler (1998) argue that civil wars are motivated by "greed" or "grievance;" the likelihood for conflict increases as poverty increases. The likelihood of conflict increases, moreover, in societies where access to government is marginalized and in socially fragmented societies where a number of competing groups potentially have different preferences over political outcomes. At the same time, Collier and Hoeffler (1998) point out, in such fragmented societies the collective action problem is much more difficult to solve. They test their model from 1960 to 1999 in five-year panels using civil war data from the Correlates of War project. They find, in short, that education reduces the risk of civil war onset, while poverty increases the risk. They also find that democracy does not matter and that ethnic fractionalization actually may reduce the risk of civil war onset. Finally, population increases civil war onset.

[15] 1= a country where rights are respected (political imprisonment, torture, and extra-judicial execution are extremely rare); 2 = a state that employ a limited use of political imprisonment, but largely avoid torture, and rarely resort to political killing; 3 = a country that routinely uses political imprisonment and extra-judicial execution occurs, but it is not endemic; 4 = a country where political imprisonment, torture, and extra-judicial killings are routine, but are only employed against those active in politics; 5 = a country where the entire population is at risk to political imprisonment, torture, and extra-judicial execution as the state regularly employs all of these tactics as a means of rule.

Elbadawi and Sambanis (2002) improve the quality of data and estimation technique in their study, but they specify a similar model. They find that economic development is significantly and negatively associated with civil war prevalence. They also find that ethnic-linguistic fractionalization has a non-monotonic effect. They find, for example, that "the effect of political development is amplified in societies which are either polarized or ethnically dominated" (Elbadawi and Sambanis 2002, 329). In contrast, Balch-Lindsay and Enterline (1999) find no statistically significant relationship between ethnic fractionalization and civil war using a different measure. In some of the Elbadawi and Sambanis (2002) runs, democracy is also negative and statistically significant. Finally, their results and others show that population size increases the risk of civil conflict.

We use these models as a baseline specification for our analyses. We capture democracy, economic development, and education in our *SEP status* variable. We then add *Population* and *Ethnic fractionalization* as control variables. We report results using the population size variable from the COW project's capabilities dataset, and like Elbadawi and Sambanis (2002) and Sambanis (2004), we take the natural log.[16] We use Taylor and Hudson's (1972) ethno-linguistic fractionalization indicator from Laitin and Fearon's (2003) replication dataset also used by Sambanis' (2004) and others.[17] This measure ranges from 0 to 1, where higher values represent high fractionalization and lower values represent ethnically dominated societies.[18] Some studies find non-monotonic relationships between ethnic fractionalization and civil war onset and duration, so we include a squared term to test for nonlinearity. We do not deny that there are other variables that affect the presence of civil conflict, but we contend that the model includes the main controls needed to assess the indirect effects of AIDS on civil conflict. Others like Ray (2003, 2005) and Achen (2002) argue, moreover, that too many variables in a regression can be dangerous and mask causal relationships. We therefore include in our models only the core

[16] Analyses using the World Bank population indicator were consistent.
[17] Our results are consistent using a variety of ethnic, linguistic, and religious fractionalization indicators such at Vanhanan's indicator of heterogeneity.
[18] Specifically, the indicator measures the probability that two randomly selected individuals belong to different ethnolinguistic groups (Taylor & Hudson 1972).

variables found to influence civil conflict. As a result, our model specification is very similar to Sambanis' (2001) "Core Economic Theory of Civil War Onset" model.[19] The main differences are that we include our composite measure of *SEP status* instead of each individual component and we have a smaller sample size.[20] The primary contribution of our research, beyond confirming Sambanis's (2001) findings, is to provide empirical evidence of the indirect effect of AIDS on conflict.

With respect to our model of human rights abuses, we use Poe and Tate's (1994) model as a baseline. These authors draw on existent literature to construct a model of state terror and human rights abuse. Their study focuses on the integrity of the person and the intensity of government coercion "designed to induce compliance in others" (Poe and Tate 1994, 854). We choose to follow Poe and Tate (1994) because we also believe that these are the most "egregious" crimes against humanity and that they can be avoided as a result of changes in government policy. Henderson (1991) and Poe and Tate (1994) argue that democracy should dampen human rights violations due to the rule of law, open participatory channels with which to influence government decisions, and associated freedoms. Henderson (1991) argues, moreover, that repression increases as a country's population increases for two reasons. First, in terms of probability, the occurrence of terror should increase as the opportunity increases; more people mean more opportunity. Second, large populations put more stress on the government in terms of policy choices (e.g. natural resources, welfare, etc.). Such a government often resorts to terrorizing the population to maintain control. Finally, economic development should decrease repression because the poorest countries tend to be the ones with the most social and political tensions, which lead the state to employ intimidation tactics to scare people into compliance. Poe and Tate (1994) find support for each of these hypotheses using data on a global sample of countries.

[19] See regression 3.3 in Table 3 of that article.
[20] He also includes "Cold War" as a control variable, but it is statistically insignificant.

Our measure of *SEP status* accounts for democracy and economic development as well as a country's societal characteristics (e.g., education levels). We also control for social tensions by adding to the mix the *Ethnic fractionalization* variable discussed above.[21] Finally, we include *Population* size (logged) in the model. Poe and Tate also control for British cultural influence, Leftist government, military control, economic growth, population change, and previous civil and international war experience. The only consistent statistically significant findings across different democracy measures and the Amnesty and State Department PTS measures, however, are the previous civil and international conflict measures. For this reason, we also include those measures in some of our model specifications. Like our measure of *Civil conflict*, our measure for *International conflict* comes from the Armed Conflict database (Type 2) and ranges from 0 to 3. In sum, our human rights model is based on Poe & Tate's core political terror model.

To address the possibility of reciprocal causation between AIDS and *SEP status*, we model the potential effect of SEP status on AIDS by including *Religious fractionalization* as a variable that should affect AIDS but not SEP status. This variable is analogous to the *Ethnic fractionalization* measure discussed above, although it measures the degree of religious, rather than ethnic, fractionalization. It comes from Fearon & Laitin's (2003) dataset, is constructed using information from the CIA Factbook and other sources, and ranges from 0 to 1.[22] The descriptive statistics for each of our variables appear in Table 3. Below, we describe how we analyze our data.

[Insert Table 3 about here]

Estimation

We estimate a different system of equations for each of our two dependent variables: *Human rights abuses* and *Civil conflict Intensity*. Each system is nonrecursive (e.g., two variables affect one another) and OLS is inconsistent because one or more of the explanatory variables is

[21] Our results are stable with or without this variable included in the model.
[22] The correlation between the two fractionalization indexes in our estimation sample is only .24.

correlated with the error term (Gujarati 1995, 642). Given that our model is over identified, the three-stage least squares (3SLS) estimator is the appropriate choice. Since it is shown to perform best on such systems (Cragg 1967), we report three-stage least squares estimates for each system.[23]

IV. Results

Table 4 reports our 3SLS regression estimates for our first system of equations: *SEP status*, *AIDS*, and *Human rights abuses*, while Table 5 reports our 3SLS results for our second system of equations: *SEP status*, *AIDS*, and intensity of *Civil Conflict*.[24] We also represent the estimated coefficients of our models along their corresponding causal paths in Figure 2 and Figure 3. Next, we calculate the direct, indirect, and total effects for variables of interest in Table 6 and Table 7. Graphs portraying the indirect effect of our key variable, *AIDS prevalence rates*, on both *Human rights abuses* and *Civil conflict intensity* appear in Figure 4. Finally, Table 8 assesses whether or not *AIDS* directly affects *Human rights abuses* and *Civil conflict intensity*.

Overall, the structural equation models demonstrate that AIDS has a significant indirect, positive effect on violent conflict. The results show that *AIDS prevalence* is negatively correlated with *SEP status*, which has a negative effect on *Human rights abuses* and *Civil conflict intensity*. Therefore, as AIDS prevalence rates increase, the propensity for and severity of human rights abuses and civil violent conflict increase. These findings hold even in the presence of reciprocal causation between *SEP stat*us and *AIDS prevalence rates*. In fact, the feedback loop amplifies the

[23] See Greene (2000, 681-84 and 692-693) for more information on identifying equations and the differences between and utility of both two-stage least squares (2SLS) and 3SLS routines. In our system, the modernization variables (i.e., agricultural output, manufacturing output, and urban population) and the religious fractionalization variable overidentify the model. Given that our model is overidentified, the 3SLS estimator is the most appropriate choice. However, as a robustness check, we estimate our system using both 2SLS and 3SLS estimators. The results are consistent across estimators (no signs change and no statistical levels of significance change), yet the 3SLS estimates differ slightly in magnitude. Cragg (1967) shows that the 3SLS estimator performs better than the 2SLS estimator on such systems and so we report the 3SLS estimates. For more information on 3SLS, see Greene (2000, 692-3).

[24] We used the 3SLS routine in Stata 9 to compute the estimates.

indirect effect of *AIDS prevalence rates* on both security variables. We discuss the specific findings below.

[Insert Tables 4 & 5 about here]

We begin by examining the variables which effect *SEP status*. The results for Equation 1 in both Tables 4 and 5 indicate that controlling for the effects of modernization, states with high *AIDS prevalence rates* experience breakdown in socio-economic-political conditions. *AIDS prevalence* rates have a statistically significant, negative effect on *SEP status*, controlling for variation in *Manufacturing*, *Agriculture*, and *Urban population*. Figures 2 and 3 communicate these effects. In both Figures 2 and 3, the path from AIDS prevalence to SEP status is about -.10. Both the Figures and the Tables show that *Manufacturing output* is positive, and statistically significant, while *Agricultural output* is negatively related to a country's *SEP status*. This suggests that larger agrarian based economies rank lower in *SEP status* than do those in which a smaller percentage of GDP is driven by agricultural output.[25] *Urban population* also increases *SEP status* as expected. In terms of standardized coefficients (not shown here), *AIDS prevalence* is second only to *Agricultural output* in explaining variance in *SEP status* across both equations.

These results hold when modeling the reciprocal causal relationship between *AIDS prevalence* and *SEP status*. The results for Equation 2 in Tables 4 and 5 show that *SEP status* has a negative and statistically significant effect on *AIDS prevalence*, controlling for *Religious fractionalization*. The paths from SEP status to AIDS prevalence in Figures 2 and 3 are equal to -1.67 and -1.80 respectively, revealing a strong negative effect. The impact of *Religious fractionalization* is positive and significant in both systems of equations. Consistent with our hypothesis, the results show that the more heterogeneous a state's religious environment is, the higher the *AIDS prevalence rate*. In other words, the more dominated a society is by one religion, the lower its *AIDS prevalence rate*.

[25] Of course, the US provides a partial exception.

The results for Equation 3 in Tables 4 & 5 show that *SEP status* is negatively associated with *Human rights abuses* and *Civil conflict intensity*.[26] Controlling for *Ethnic fractionalization* and total *Population*, the results confirm that as the social, political, and economic climate of a state erodes, both the severity of human rights abuses and the intensity of Civil conflict increases. Though the effect is stronger for *human rights abuses* than *civil conflict intensity*, Figures 2 and 3 illustrate negative, statistically significant paths from *SEP status* to both *Human rights abuses* and *Civil conflict intensity*. While the logged value of *Total population* is significant in both models, ethnic fractionalization is only significant in the human rights model. While Poe and Tate (1994) show that population matters, the *Ethnic fractionalization* finding reported here is new and its robustness should be examined in future studies. Consistent with Sambanis' studies, we also tested for a nonlinear *Ethnic fractionalization* effect but found no evidence for a non-monotonic relationship between *Ethnic fractionalization* and *Civil conflict*. Consistent with Balch-Lindsay and Enterline (1999) and many of Sambanis' and his colleagues reported results, we find no relationship between *Ethnic fractionalization* and *Civil conflict*, linear or nonlinear.

To examine how AIDS indirectly affects a state's security, the main purpose of our study, we calculated the indirect effect of *AIDS prevalence rates* on both *human rights abuses* and *Civil conflict intensity*. As Figures 2 and 3 suggest, as a state's *AIDS rates* increase, the state's *SEP status* decreases in turn. This decrease in *SEP status* indirectly causes an increase in *AIDS rates*.

[26] We also performed a series of robustness checks. First, we examined the internally measured dependent variable assumption for OLS regression. Both our dependent variables are ordered categorical variables. To check the robustness of our results, we ran 3SLS regressions on our *AIDS prevalence rates* and *SEP status* variables only. Then we ran ordered probits on our security variables using the predicted values generated form the 3SLS runs. The results are consistent with the results reported in Tables 4 and 5. The dependent variables assume constant, linear intervals between the point values on each scale. The cut point estimates obtained from the ordered probit runs were virtually identical, indicating that the constant, linear interval assumption is valid. Given these properties, linear regression is appropriate. Poe and Tate (1994) also report OLS regression estimates in their study of human rights abuses. Second, we included a few other variables in the human rights models consistent with Poe and Tate (1994). As stated above, we checked to see if civil conflict and or international conflict had an effect on the human rights abuses and/or the results reported in Tables 4 and 5. Additional runs (not reported here) produced positively signed, statistically significant coefficients on civil conflict when included in the human rights model. However, international conflict did not produce statistically significant coefficients. While our civil conflict finding is consistent with Poe and Tate (1994), the insignificant coefficient on international conflict deviates from their results. We speculate that our non-significant finding with regard to international conflict is attributable to a lack of international conflict cases in our two-year sample.

In effect, *AIDS* exerts an indirect effect on itself. The same thing can be said for *SEP status*. As *SEP status* decreases, *AIDS increases* and causes a decrease in *SEP status*. In sum, the feedback loop augments the total and indirect effects of the exogenous and endogenous variables. When the product of the two estimated endogenous coefficients is positive, total and indirect effects are amplified by the feedback loop. When the product is negative, total and indirect effects are dampened by the feedback loop. Since the products in both of our estimated systems are positive (.184 and .180), the effects will be amplified.

In each system of equations, the total effect of *AIDS* on *SEP status* and *SEP status* on *AIDS* can be expressed as infinite series because the variables continuously feedback on one another (Fox 1980, 17). These series converge, however, if the absolute value of the product of the two estimated endogenous coefficients is less than one. If not, the system is unstable. Both of our systems are stable, as the product of the coefficients on *AIDS* and *SEP status* for each system is less than one. For stable systems, one uses a series of mathematically derived formulas outlined in Fox (1980, 14-19) to calculate the total and indirect loop-enhanced effects in a nonrecursive system. Those calculated effects appear in Tables 6 and 7.[27]

[Insert Tables 6 & 7 about here]

In both Table 6 and Table 7, the loop-enhanced indirect effect of AIDS on security indicates that as AIDS rates increase, the severity of human rights abuses increases by .094 units and the intensity of civil conflict increases by .05 units. We plot these effects across different values of AIDS prevalence rates in Figure 4. Specifically, Figure 4A, shows that as *AIDS* rates increase from 11% to 22%, *Human rights abuses* increase from level 1 to level 2 on a 5-point scale, holding all other variables constant. As *AIDS* rates increase from 22% to 38%, *Human rights abuses* increase from level 2 to level 3 on a 5-point scale, holding all other variables constant. Similarly, Figure 4B, shows that as *AIDS* rates increase from 11% to 22%, *Civil conflict*

[27] In stable systems, the denominator in the calculations is represented by the difference between one and the product of the estimated endogenous coefficients (See Fox 1980, 14-19).

intensity increases from just above 0 to 1 on a 0 to 3 scale, holding all other variables constant. As *AIDS* rates increase from 22% to 38%, *Civil conflict intensity* increases from level 1 to about level 2 on a 0 to 3 scale, holding all other variables constant. It appears that AIDS, while having substantively significant impacts on both variables, has a larger impact on human rights abuses. Nonetheless, both models reveal that changes across *AIDS rates* generate fairly large fluctuations in human rights abuses and civil conflict intensity. Both graphs in Figure 4 illustrate that *AIDS prevalence rates* indirectly increase the severity of *Human rights abuses* and the intensity of civil conflict even in the presence of reciprocal causation between *SEP status* and *AIDS rates*.

[Insert Figure 4 about here]

Briefly, we will examine the effects of a few other variables on security. To begin, Table 6 shows that a one unit increase in *SEP status* leads to a 1.598 decrease on the human rights abuse index (holding all other variables constant). This effect is the total effect of *SEP status*, which includes the loop enhanced effect that *SEP status* has on itself through *AIDS* and the direct effect that it has on *Human rights abuses*. This same effect is equal to almost -1 in the civil conflict model. These findings are consistent with other results from previous studies that a state's social, political, and economic environment has a strong impact on the severity of human rights abuses and the intensity of civil conflict. In terms of the indirect effect of *Religious fractionalization* on security, Tables 6 and 7 show that a one unit increase in *Religious fractionalization* (i.e. moving from a completely homogeneous religious society (0) to a completely heterogeneous society (1)), leads to a .372 increase on the *Human rights abuse* index and a .192 increase on the *Civil conflict intensity* scale, holding all other variables constant. This is consistent with our hypothesis in that the more religiously fractionalized a state is, the greater the *AIDS rate* should be. The greater the state's *AIDS rate*, the smaller the state's *SEP status* should be, and thus, the more conflict it should experience. As for the modernization variables, they also perform as expected. *Manufacturing* and *Urban population* indirectly decrease our conflict variables and our

Agriculture variable increases conflict. The results imply that modernization indirectly decreases conflict by strengthening political institutions, the economy, and the educational system.

We have demonstrated the indirect effect of AIDS on security, but the question still remains whether HIV/AIDS directly affects the intensity of human rights abuses and violent civil conflict. The OLS regression results reported in Table 6 reveal that *AIDS* does not have a direct effect on our security measures. Specifically, the results fail to provide evidence of a statistically significant correlation of *AIDS prevalence rates* with *Human rights abuses* and *Civil conflict*. Note, however, that *SEP status* retains its significant, strong negative correlation with *Human rights abuses* and *Civil conflict* when *AIDS* is included in the model. Our previous results suggest that part of the variance in *SEP status* can be attributed to the variance in *AIDS prevalence* rates. The results in Table 8 further support our argument about the indirect effects of HIV/AIDS on violent conflict.

V. Conclusion

AIDS kills as surely as war. In fact, ten times as many Africans die today from AIDS as lose their lives in war (UNAIDS 2000). That HIV/AIDS also kills by making violent conflict more likely and more intense only heightens the catastrophic consequences of the disease. It also moves the study of HIV from the "low politics" of public health and economic development to the "high politics" of national security. Public officials, journalists, public health advocates, and scholars increasingly recognize the link between HIV/AIDS and national security, but the relationship has been under-researched and, arguably, poorly understood.

Our research provides systematic and compelling evidence that HIV/AIDS affects security, at the same time that it illuminates the causal links between the two variables. HIV/AIDS has an indirect, positive effect on violent conflict by contributing to the breakdown of the social, economic, and political conditions within a state. The multivariate analyses provide such evidence of the indirect effects of AIDS on conflict, controlling for external factors and

modeling the potential for reverse causality between *AIDS* and *SEP status*. Overall, the findings show that AIDS has an indirect positive effect on the occurrence and severity of human rights abuses and civil conflict.

Despite the grim news on AIDS, the impact of the pandemic on conflict is indirect. HIV/AIDS has no direct influence on the outbreak or intensity of violent conflict. Rather, it affects this aspect of national security indirectly through its influence on the social, political, and economic conditions within a state. To date, a small number of scholars (i.e., Fidler 2003; Ostergard 2002; Price-Smith 2002; Singer 2002) have used anecdotal and case-study evidence to convince a skeptical audience that AIDS threatens national security. This study provides the first systematic empirical evidence of that link.

Two caveats are in order. First, we show that HIV/AIDS leads to conflict within countries by eroding social, political, and economic conditions. Many of the arguments linking AIDS and security come from or seek to convince Americans that U.S. security is threatened by high HIV/AIDS rates in Africa and elsewhere.[28] Our study does not specifically address U.S. security. Whether the overall increase in AIDS-induced conflict threatens U.S. and/or Western security depends on whether and to what extent the West has strategic interests at stake in conflict-ridden areas of the world and whether and to what extent AIDS-induced conflict spills across national borders. Second, we do not mean to argue that AIDS is exclusively or even largely a security threat. This pandemic remains largely a humanitarian and economic crisis, albeit one of epic proportions. Its security dimensions, while present and significant, are dwarfed in comparison to the other costs of the disease. Certainly, if the pandemic is not brought under control in the near future through medical advances, prevention education programs, and treatment, hundreds of millions more will die, and the externalities of AIDS—including civil armed conflict and human rights abuses—will only increase. At the same time, while AIDS

[28] See Peterson 2002/3.

HIV/AIDS presents a significant, if indirect threat to national security, it poses a much greater and more direct threat to the health and prosperity of nations.

Our research suggests several avenues for future research. First, there is a need to explore the impact of HIV/AIDS on other aspects of security. The most obvious omission in this paper is the possible link between the pandemic and international conflict. Analyzing this link requires data on prevalence rates over a much longer time period, since there are so few cases of international conflict in any given year. A significant literature also explores the impact of HIV/AIDS on military personnel and peacekeeping capabilities (i.e., Elbe 2003; Heinecken 2001). The clear need for systematic empirical evidence on this topic remains unfulfilled, however, because of the difficulty of obtaining reliable cross-national data on military infection rates. Second, while HIV/AIDS affects the occurrence and intensity of violent conflict, it also is the product of that conflict; war spreads HIV (Elbe 2002). Our future research seeks to model the effect of the pursuit of national security, particularly through war, on HIV/AIDS prevalence. Finally, the relationship between AIDS and democracy is as poorly understood as that between AIDS and security.[29] In our larger project on HIV/AIDS, we also explore the reciprocal relationship among HIV/AIDS and democratic governance. Understanding the global HIV/AIDS pandemic requires recognition of the close links among disease, democracy, and security.

[29] For a good overview, see Nelufule 2004.

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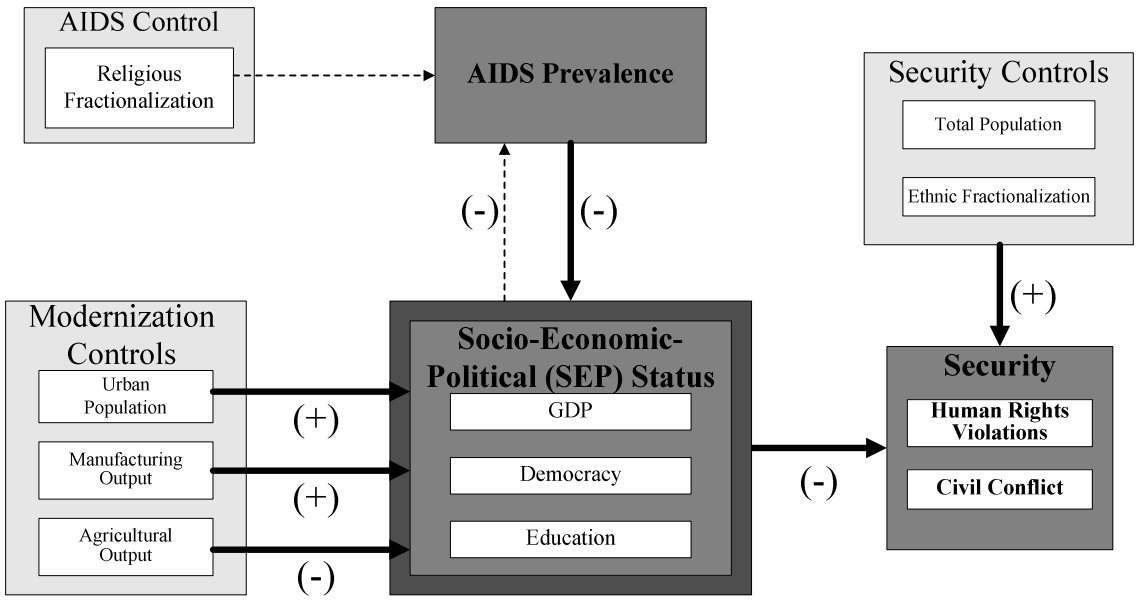

Figure 1 The Causal Model

Table 1
Factor Analysis

Variable	GDP, Democracy, & Education Eigenvalues
Factor 1	1.32
Factor 2	0.82
Factor 3	0.75

Table 2
Correlation Matrix SEP Status & Components (for estimation sample)

	GDP	Democracy	Education	SEP Status
Aids Prevalence	-.09*	-.19***	-.26***	-.18***
GDP	1	.19***	.30***	.50***
Democracy		1	.43***	.79***
Education			1	.56***

Statistical significance (one-tailed test): *** < .01, ** < .05, *<.10

Table 3
Descriptive Statistics for Estimation Sample

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
AIDS Prevalence Rate	2.57	5.94	0	38.20
Agriculture (value added)	17.23	13.85	.13	60.55
Manufacturing (value added)	15.70	7.77	3.05	57.00
Urban Population	11,519.56	29,896.76	0	240,091
Socio-Economic-Political Status	.11	.91	-2.05	4.08
Ethnic Fractionalization	.48	.20	0	1
Religious Fractionalization	.36	.22	0	.78
Population (logged)	9.28	1.56	3.64	14.06
Scaled Human Rights Abuses (PTS)	2.54	1.07	1	5
Scaled Civil Armed Conflict	.29	.80	0	3

Table 4
Simultaneous Equation Three Stage Least Squares Regression Estimates: PTS

Variable	Equation 1 SEP Status (GDP-Democracy-Education)	Equation 2 AIDS Prevalence	Equation 3 Political Terror Scale (1-5)
AIDS Prevalence Rate	-0.107*** (0.034)	-	-
Manufacturing (value added)	0.009* (0.007)	-	-
Agriculture (value added)	-0.028*** (0.005)	-	-
Urban Population	4.29×10^{-06}** (2.4×10^{-06})	-	-
SEP Status	-	-1.667** (.942)	-.721*** (.179)
Religious Fractionalization	-	3.969** (2.17)	-
Ethnic Fractionalization	-	-	.499* (.353)
Total Population (logged)	-	-	.395*** (.056)
Constant	0.735*** (.195)	1.756** (.948)	-1.238*** (.513)
F-statistic	16.12***	4.49***	27.00***
N	160	160	160

Statistical significance (one-tailed test): *** < .01, ** < .05, *<.10

Table 5
Simultaneous Equation Three Stage Least Squares Regression Estimates: Civil Conflict

Variable	Equation 1 SEP Status (GDP-Democracy-Education)	Equation 2 AIDS Prevalence	Equation 3 Intensity of Civil Conflict (0-3)
AIDS Prevalence Rate	-0.100*** (0.037)	-	-
Manufacturing (value added)	0.010* (0.007)	-	-
Agriculture (value added)	-0.026*** (0.005)	-	-
Urban Population	5.29×10^{-06}** (2.4×10^{-06})	-	-
SEP Status	-	-1.802** (.915)	-.406*** (.168)
Religious Fractionalization	-	3.872** (2.16)	-
Ethnic Fractionalization	-	-	.007 (.341)
Total Population (logged)	-	-	.237*** (.052)
Constant	0.682*** (.208)	1.808** (.943)	-1.829*** (.470)
F-statistic	15.91***	4.67***	8.81***
N	161	161	161

Statistical significance (one-tailed test): *** < .01, ** < .05, *<.10

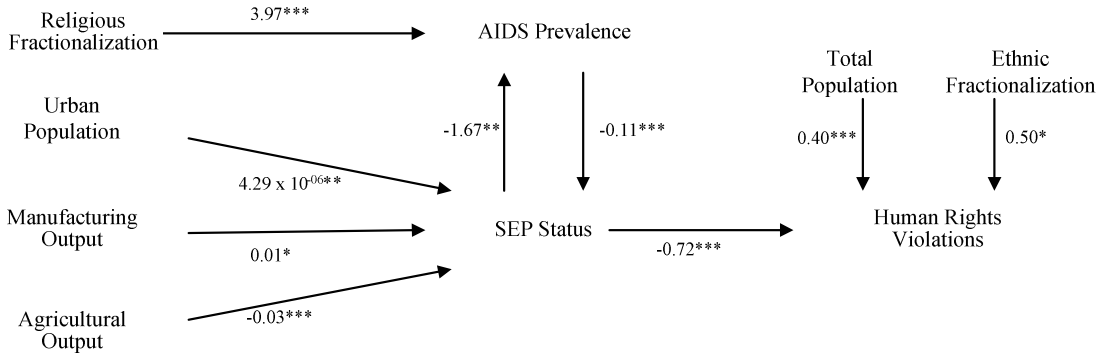

Figure 2 Human Rights Abuses Path Results

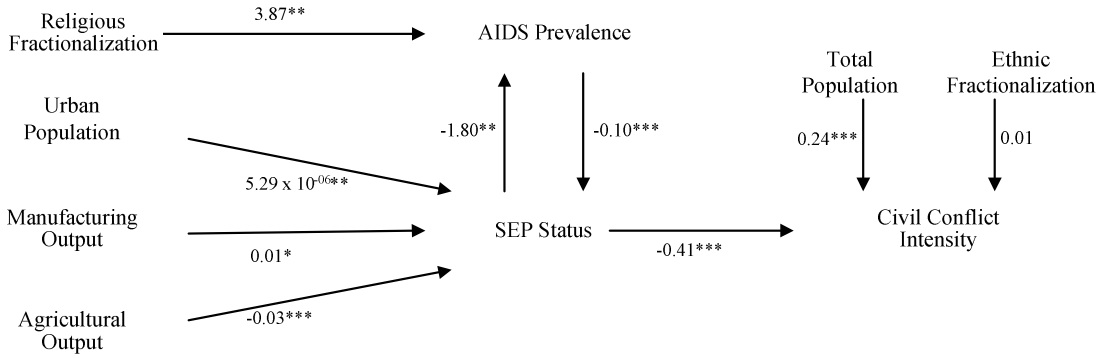

Figure 3 Civil Conflict Intensity Path Results

Table 6
Loop-Enhanced Effects on Human Rights Abuses [a]

Variable	Direct Effect	Indirect Effect	Total Effect
AIDS Prevalence	-	.094	.094
SEP Status	-.721	-.877	-1.598
Religious Fractionalization	-	.372	.372
Urban Population	-	-6.720×10^{-07}	-6.720×10^{-07}
Value Added: Manufacturing	-	-.001	-.001
Value Added: Agriculture	-	.004	.004

[a] Effects are calculated using the formulas in Fox (1980).

Table 7
Loop-Enhanced Effects on Civil Conflict Intensity [a]

Variable	Direct Effect	Indirect Effect	Total Effect
AIDS Prevalence	-	.050	.050
SEP Status	-.406	-.500	-.906
Religious Fractionalization	-	.192	.192
Urban Population	-	-4.715×10^{-07}	-4.715×10^{-07}
Value Added: Manufacturing	-	-8.912×10^{-04}	-8.912×10^{-04}
Value Added: Agriculture	-	.002	.002

[a] Effects are calculated using the formulas in Fox (1980).

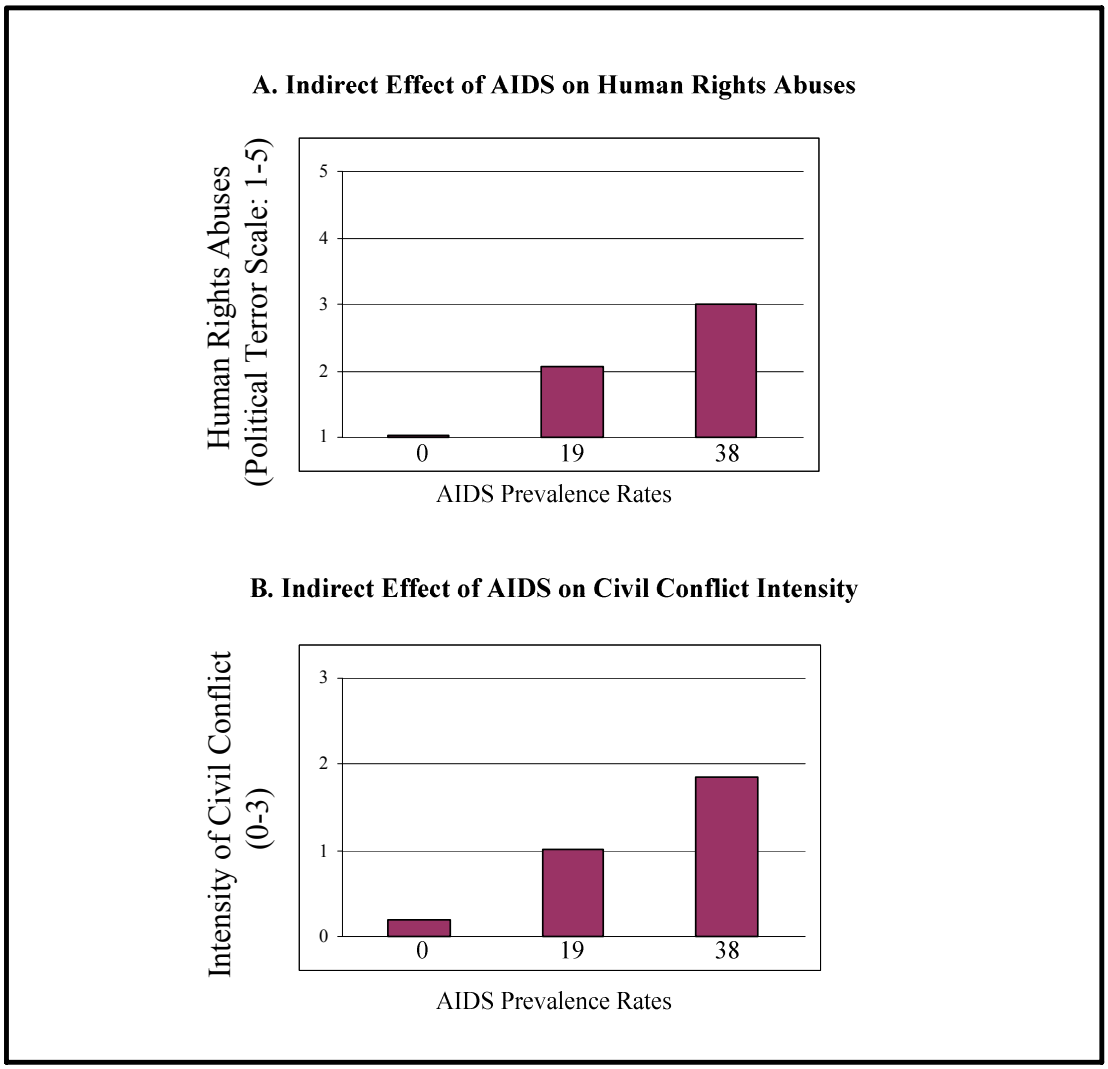

Figure 4 Indirect Effects of AIDS on Security

Table 8
Direct Effect of AIDS on Security?

Variable	Political Terror Scale (1-5)	Intensity of Civil Conflict (0-3)
AIDS Prevalence Rate	.009	-.006
	(.008)	(.005)
SEP Status	-.420***	-.178**
	(.081)	(.086)
Ethnic Fractionalization	.694***	.095
	(.270)	(.271)
Total Population (logged)	.397***	.239***
	(.042)	(.056)
Constant	-1.418***	-1.872***
	(.418)	(.474)
N	177	179

Statistical significance (one-tailed test): *** < .01, ** < .05, *<.10

Appendix

Table 1
Countries in Our Estimation Sample
(At least one year for each country appears in our sample)

Albania
Algeria
Argentina
Armenia
Australia
Austria
Azerbaijan
Belgium
Belarus
Benin
Bolivia
Botswana
Brazil
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Canada
Central African Republic
Chile
China
Colombia
Congo
Costa Rica
Croatia
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
Eritrea
Estonia
Fiji
Finland
France
Gabon
Gambia
Ghana
Greece
Guatemala
Guinea
Guinea Bissau
Honduras
Hungary
India
Indonesia
Iran
Ireland
Italy
Ivory Coast
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kyrgyzstan
Laos
Latvia
Lebanon
Lesotho
Lithuania
Malaysia
Mali
Mauritania
Mexico
Moldova
Mongolia
Morocco
Mozambique
Namibia
Nepal
Netherlands
Nicaragua
Niger
Nigeria
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Rwanda
Romania
Saudi Arabia
Senegal
Sierra Leone
Slovakia
South Africa
Spain
Sri Lanka
Sudan
Swaziland
Sweden
Syria
Tajikistan
Tanzania
Thailand
Togo
Trinidad
Tunisia
Turkey
Uganda
United Kingdom
Ukraine
Uruguay
Uzbekistan
Venezuela
Zambia
Zimbabwe