Causal Effects of Epidemics on Conflict: A Summary of the Evidence[*]

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Abstract

The links between the prevalence of epidemics and conflict, especially in the developing world, are manifold and complex. A substantial consensus in the policy-focused and non-econometric literature suggests strong links, with causality in both directions. Rigorous statistical evidence is scant but indicates that epidemics do contribute to civil conflict. This paper summarizes the evidence and briefly identifies its strengths and weaknesses.

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1. Introduction

Epidemics have consequences that are immediate and obvious, and also some that are subtler. They cause illness, death, and emotional stress, but they also eliminate productive working years and break up the family unit. Through various channels, epidemics may contribute to conflict as well. The links between epidemics and conflict are manifold and complex. Because conflict is such an obstacle to development for poor countries, the links certainly merit study. What follows is a discussion of the relevant empirical evidence gathered to date.

The most difficult issue in interpreting the links between epidemics and conflict is that of causality. One can imagine several possible relationships between epidemics and conflict, with causality flowing in both directions. An epidemic may lead to conflict if it erodes economic conditions to the point where people are desperate enough to attack a ruling elite or to grab for resources in neighboring countries. Epidemics may also foment a civil conflict if a government's inability to deal with them reduces confidence in its leadership. An epidemic may also export conflict, if refugees fleeing the spread of disease cause instability in the countries where they settle.

Conversely, conflicts may help epidemics to spread. Military forces and their supply networks can cover great distances during a campaign, taking a disease along with them. Sometimes they may use sex as a weapon, creating contagion through forced intimacy. Disease also spreads easily in military camps, where many people are backed together in conditions that are not always sanitary. There are indirect effects, too; if a country is involved in conflict, it may also have less money to pay for the public health interventions that could stop a disease's transmission.

There is one important distinction to draw between these two directions of causality. Conflicts may worsen an epidemic, but they cannot start one (except via a biological weapon, which is virtually unheard of). Epidemics, by contrast, may be able to spark a conflict on their own or in combination with other factors. Epidemics and conflicts are

both difficult to stop once they start, but this difference makes the first direction of causality – from epidemic to conflict – particularly interesting.

2. Empirical Context

As Iqbal and Zorn [2010] note, there has been relatively little econometric study of the epidemics-to-conflict direction of causality. Plenty of anecdotal evidence has been collected, however, and experts from academia and policy have identified several actual channels through which epidemics can contribute to conflict.

Most of these publications deal with links between epidemics and conflict in developing countries. Schneider and Moodie [2002], in a comprehensive policy paper, describe how HIV/AIDS can be a source of political tension, as in the case of the African National Congress, the ruling party in South Africa, which has split into factions over how to handle the epidemic. They note that civil servants in sub-Saharan Africa are more likely to be infected with HIV than the general population, which may further weaken government effectiveness. They also describe how the decimation of military forces by epidemics can decrease the strength of international peacekeeping forces, leading to a higher risk of conflict in countries that may not even be affected by the diseases in question.

In a medical paper, de Waal and Whiteside [2003] report that the spread of HIV/AIDS can contribute to famine, which is a substantial risk factor for conflict. Sagala [2006] shows how epidemics might reduce the readiness of military forces and erode command structures, thus making a country more vulnerable to attack. Price-Smith et al. [2007] point out that the epidemics are raising the level of inequality in South Africa, which could create instability in the long term. Feldbaum et al. [2006] provide a useful summary of other, mainly non-econometric studies.

There is also a substantial literature about how the epidemics-to-conflict direction of causality can affect the interests of wealthy countries. Gow [2002] and Joireman [2004], for example, explicitly address how epidemics in the developing world may threaten the national security of the United States. Pereira [2009] asserts that the President's Emergency Plan for AIDS Relief, a major American program launched in 2003, is actually a counterinsurgency technology. These papers followed the identification of HIV/AIDS as a threat to national security by the United States in 2000, which was followed by similar language in Resolution 1308 of the United Nations Security Council that same year.

None of these studies, however, uses rigorous econometric methods to establish the epidemics-to-conflict causal link, a fact that is noted pointedly by Barnett and Prins [2005] and, most recently, by McInnes and Rushton [2010].

3. Statistical Evidence

The paucity of rigorous studies may have more to do with the econometric expertise of the researchers interested in this topic than with the weight of the evidence. The first and only study to adopt an appropriate econometric model, Peterson and Shellman [2006], does indeed find a strong causal link between the prevalence of AIDS and the occurrence of civil conflict in an analysis of 112 countries.

The difficulties in the econometric analysis of the epidemics-to-conflict direction of causality are twofold. First, resolving a causality question requires a two-stage or instrumental variable model. Second, because most of the channels through which this direction of causality works are indirect; epidemics pass through economic, political, and social factors on their way to affecting security. This means that a third stage must be added to the analysis, so that the variation associated with these relationships can be captured.

Peterson and Shellman [2006] do use a three-stage simultaneous equations approach. They combine several variables representing a country's institutional environment to create a channel through which epidemics may affect the level of civil conflict and human rights abuses by the state. They call this channel "socio-economic-political status" and define it as "a composite measure of a country's social conditions, economic prosperity, and political institutions."

To resolve the issue of reverse causality, Peterson and Shellman choose religious fractionalization as an instrumental variable that should, according to their hypotheses, be associated with the prevalence of AIDS but not with social-economic-political status. Using this specification, they find a statistically significant causal link between the prevalence of AIDS and the level of civil conflict. The effect is enhanced by a feedback loop between the prevalence of AIDS and social-economic-political status; in other words, the model accounts for the fact that greater prevalence of AIDS may erode socio-economic-political status, which may in turn lead to still greater prevalence of AIDS.

Accounting mathematically for this feedback loop, Peterson and Shellman find that an increase of roughly two standard deviations in the prevalence of AIDS results in an increase of about one standard deviation in the level of civil conflict. In real terms, the model predicts that an increase to 22 percent prevalence of AIDS from 11 percent would be enough to engender a minor armed conflict in a previously peaceful country.

Following Peterson and Shellman, Barnett and Dutta [2008] present a statistical study of the relationship between the prevalence of HIV and fragility of the state. Though they attempt to control for many independent variables that may affect the likelihood of a state to fail, they do not adopt a two- or three-stage specification. This is a puzzling omission, especially coming after the model presented by Peterson and Shellman. Moreover, the prevalence of HIV is strongly correlated with five of Barnett and Dutta's eight other explanatory variables, suggesting that multicollinearity could be a problem for their specification. Perhaps not surprisingly, the statistically significant relationship between HIV prevalence and fragility of the state that appears in their shortest regression

disappears in the longer specifications. Finally, the non-linearity in their results could benefit from further examination; there appear to be decreasing returns in terms of conflict from higher prevalence rates of AIDS.

The data sets used in both studies had several shortcomings. Peterson and Shellman's index of civil conflict is left-censored, a fact which is not explicitly accounted for in their model, and not every country appears in both years of their panel, 1999 and 2001. Their analysis would also be enriched by separating the three channels they identify rather than combining them in one variable. Barnett and Dutta, in addition to using an ordinary least squares specification, consider just one year, 2003, and as few as 80 countries. In both studies, the selection of countries is limited by the availability of data, not any empirical norm, and thus could distort the results.

4. Conclusions

In 2005, the scientist and historian Jared Diamond stated in a television interview that "AIDS and malaria and TB are national security issues" [Diamond, 2005]. At that point, no one had provided rigorous empirical evidence to back up Diamond's claim. Five years later, evidence of an epidemics-to-conflict causal link continues to be scant. However, the results reported by Peterson and Shellman indicate that future study – perhaps with an improved data set and the inclusion of more independent variables – would be merited. It would certainly be surprising if the overwhelming consensus in the community of policy-focused and non-econometric researchers were shown to be completely wrong. Analyses of causal links involving epidemics besides HIV/AIDS, such as malaria and tuberculosis, would also be welcome. In any event, the definitive study of this topic has yet to be published.

To the extent that the prevalence of epidemic diseases does contribute to conflict, there is a case to be made both for treatment of infected populations and for prevention of further contagion. At present, millions of infected people are receiving no treatment, and

millions of people are dying from the three epidemics mentioned above every year [World Health Organization, 2008], despite the existence of effective medicines for all of them. Changing this situation would not just save lives from disease, but would also save additional lives from conflict.

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