

# Civil War & the Global Threat of Pandemics

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*Abstract: This essay confronts the collision of two potential global threats: the outbreak of infectious pandemics and the outbreak and protraction of civil wars. Specifically, it addresses the potential that civil wars can elevate the risk that an infectious outbreak will emerge; the possibility that civil wars can reduce the capacity to identify and respond to outbreaks; and the risk that outbreaks in areas of civil conflict can generate political and security challenges that may threaten regional and international order. Both global health governance and international security structures seem inadequate to address the health and security challenges posed by infectious outbreaks in areas of civil conflict. New approaches that better integrate the technical and political challenges inherent in preventing pandemics in areas of civil war are urgently required.*

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The West African Ebola outbreak is thought to have begun with little Emile Ouamouno, a one-year-old who died in December 2013 in the village of Melian-dou, Guinea. By the time the outbreak was declared over in January 2016, an official tally of some 11,300 people had died and more than 28,000 had been infected in the three most heavily affected countries: Guinea, Sierra Leone, and Liberia. The economies and health care systems of these three countries had been devastated, which in turn resulted in more suffering and countless lost lives. The armed forces of the affected countries had been mobilized, as were units from the United Kingdom and the United States, including the famed 101st Airborne Division (Air Assault). While the impact of this outbreak in death, human suffering, and fear was catastrophic, this essay raises the question of what might the impact of an Ebola outbreak have been if it had occurred not in 2013 but in 2000, when Guinea, Sierra Leone, and Liberia were embroiled in brutal civil wars. This question seems particularly relevant given that the 2013 Ebola outbreak exposed current global health struc-

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tures as largely incapable of operating effectively in countries with poor health systems and weak governance, characteristics likely to be particularly apparent in areas plagued by protracted civil unrest. In such settings, global health imperatives may collide with global security structures, a collision for which neither arena of global governance appears adequately prepared.

The interaction between epidemic disease and civil conflict has evolved dramatically over the centuries. The past several decades have witnessed the predominance of protracted civil conflicts that do not readily conform to traditional boundaries between war and peace. Rather, prolonged, churning instability has become common with periods of relative calm interrupted by eruptions of violent, often vicious conflict. While the diseases associated with these new forms of war have also evolved, what has altered the threat of war-generated epidemics forever is the unprecedented potential for rapid dissemination throughout the world.

This discussion is premised on the dual recognition that global infectious pandemics have the potential to threaten the international order and that civil wars may enhance the risk that such a pandemic will emerge and have a global impact. Three related mechanisms are of central concern: 1) the possibility that civil wars can elevate the risk that an infectious outbreak with pandemic potential will emerge; 2) the possibility that civil wars can reduce outbreak surveillance and control capacities, resulting in silent global dissemination; and 3) the potential that infectious outbreaks emerging in areas plagued by civil conflict can generate complex political and security challenges that can threaten traditional notions of national sovereignty and enhance incentives for international intervention.

Interestingly, the very definition of a pandemic foretells the intricate dance between

epidemiology and politics that always accompanies a global infectious outbreak. The Centers for Disease Control and Prevention (CDC) defines a pandemic as “an epidemic that has spread over several countries or continents, usually affecting a large number of people.”<sup>1</sup> It involves epidemiology since it has at its core the dynamics of disease progression and infectious transmission from individual to individual. However, the definition also recognizes that pandemics must cross national borders, an inherent acknowledgement that pandemics relate to notions of state sovereignty and governance.

The majority of the approximately four hundred emerging infectious diseases that have been identified since 1940 have been zoonoses: infections that have been transmitted from animals to humans. Commonly, the infectious agent lives in the animal host, often without causing any discernable disease. The animals thereby serve as a “reservoir” for the infectious agent. The jump, or “spillover,” from the animal host to human populations can be due to an unusually close contact, such as slaughtering an infected animal, and may be associated with a mutation in the infectious microbe making it more likely to infect a human host. Human immunodeficiency virus (HIV) is the iconic disease that emerged from a spillover from a simian host. Emergent infectious diseases can also require arthropod blood-seeking insects for transmission such as mosquitoes or ticks. Mosquitos serve as “vectors” in such diseases as malaria, yellow fever, and zika, and involve cycles of mosquito transmission from reservoir animals with spillover to humans. The emergence of a zoonosis with the potential for pandemic spread generally occurs when there is a change in the long-standing ecology of human-animal-infectious agent interaction. The importance of this ecological relationship has been recognized by the One Health Initiative, which links hu-

man and veterinarian medicine within a new ecological framework.<sup>2</sup> For the most part, human factors, such as the expansion of human populations into previously forested areas, domesticated animal production practices, food shortages, and alterations in water usage and flows, have been the primary drivers of altered ecological relationships. There is also substantial evidence that climate change is reshaping ecological interactions and vector prevalence adjacent to human populations.<sup>3</sup> Enhanced trade and air transportation have increased the risk that an outbreak will spread widely. While infectious outbreaks can be due to all forms of infectious agents, including bacteria, parasites, and fungi, viruses are of the greatest pandemic concern.

New infectious agents can emerge anywhere humans inhabit the planet. However, the science of emerging infections suggests that the greatest danger of pandemic generation lies in tropical and subtropical regions where humans and animals, particularly wild animals, are most likely to interact. Recent analyses have suggested that the “hotspots” for emerging infectious diseases lie in Eastern China, Southeast Asia, Eastern Pakistan, Northeast India and Bangladesh, Central America, and the tropical belt running through Central Africa from Guinea, through Nigeria, the Democratic Republic of the Congo (DRC), Rwanda, and Burundi, and into Ethiopia.<sup>4</sup> These hotspots have been identified using sophisticated analytic models but generally approximate areas where new or intense human activity coincides with high wildlife and microbial diversity. This elevated risk includes both the initial spillover of infectious agents from animal to human populations as well as the potential for substantial human-to-human transmission due to local conditions, such as human population density and movement.<sup>5</sup>

Although serious pandemics have emerged from mid-income countries, such

as Severe Acute Respiratory Syndrome (SARS) in Southern China and H1N1 influenza likely in Mexico, there is considerable overlap between the hotspots for emerging infections and hotspots of civil conflict. Of particular concern is the role of social disruption and forced migration in generating the conditions for pandemic emergence. Combat operations and the threat of violence invariably generate the migration of civilian populations into safer locations, often into forested or other remote areas where intense interaction with wildlife populations is more likely. In addition, the search for food among these refugee populations may require the hunting of nontraditional forms of wildlife, such as rodents, bats, or primates, which can greatly elevate the risk of zoonotic spillover. For example, the dangerous Ebola, Marburg, and Nipah viruses are carried by bats, and the virus that caused the 2002–2004 SARS outbreak was also likely transmitted by bats.

While the emergence of new human diseases is not confined to areas plagued by war, populations fleeing civil war may also intensify the early human-to-human transmission of emerging infections.<sup>6</sup> Refugee camps are usually characterized by people living in extremely close proximity to one another, often crowded into makeshift shelters, elevating the risk of transmission. In addition, malnutrition and poor hygiene and sanitation can also elevate the risk of infection. However, while the impact of civil conflict on pandemics may elevate the risk that a new infectious disease will emerge, the greater concern is that civil conflict will undermine the local and global capacity to control it.

There exists a significant technical capacity to ensure that a local infectious outbreak is not transformed into a global pandemic. There also exists a global health governance system charged with employing this technical capacity whenever and wherever such an

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outbreak emerges. The control of infectious outbreaks requires some level of organized collective action; in essence, effective governance. Together, the technical and governance requirements for controlling the risk of pandemics can be grouped into three general categories: prevention, detection, and response.

Prevention requires the provision of immunization, when effective vaccines exist. Immunization programs for polio, cholera, yellow fever, measles, and a variety of other infectious illnesses are effective and relatively inexpensive. Immunization to prevent influenza is a special case: while generally effective, it must be given annually since the immunization is directed at only one strain of virus, which varies from year to year. Prevention also includes efforts to alter behaviors that elevate the risk that an infectious agent will jump from animals to humans. For example, a behavioral modification campaign was implemented in Sierra Leone to confine an outbreak of Lassa fever, relying primarily on disseminating information on how to avoid exposures to rodents, the primary carrier of the Lassa virus.<sup>7</sup> Educational efforts have sought to reduce the risk of the animal-to-human spillover associated with the hunting of non-domesticated tropical animals, generally referred to as “bushmeat,” which in many areas includes monkeys and bats. These educational efforts have been targeted at reducing hunter exposure to the blood and other bodily fluids of bushmeat prey, as some communities may depend upon the hunting of bushmeat for nutrition or livelihood.

The early detection of an infectious outbreak with pandemic potential is a fundamental component of any pandemic control capacity. However, the requirements for an effective detection capability are both technically and organizationally complex. The early detection of worrisome infectious agents in animal or human populations re-

quires a strong and methodical surveillance infrastructure.<sup>8</sup> The routine collection and testing of samples drawn from domesticated poultry and pig production chains can provide early warning of a potential for spillover into human populations. Similarly, the sampling of wildlife, including potential vectors, such as mosquito or rodent populations, is also a standard mechanism for identifying the presence of worrisome infectious agents. The detection of actual animal and human illnesses requires a clinical capacity that can both identify worrisome cases and report this concern to the appropriate pandemic alert systems. Clinically distinguishing illnesses that may be of pandemic potential is not easy, since many such illnesses can present with relatively ordinary symptoms, such as fever and malaise. Indeed, potentially pandemic influenza generally presents as “the flu.”

The development and maintenance of animal surveillance systems in areas characterized by civil conflict and poor security can be extremely challenging. Routine animal surveillance demands substantial logistical chains and careful organizational controls. The sampling protocols cannot be based on isolated events or convenience samples but must be representative of the actual environment to be of any practical utility. In addition, animal surveillance systems require adequate laboratory capacity to identify the viruses or other infectious agents of concern. Because most laboratories capable of performing the requisite tests are located in capital cities or regional centers, this generally means that samples must be routinely collected and transported from relatively remote sites and travel substantial distances. In many low-resource areas, even relatively sophisticated laboratories may not have the requisite biosafety capabilities to test for highly infectious agents. While possible, overcoming these logistical challenges in insecure areas can be exceedingly difficult.

Detection may also require the ability to quickly discern patterns of atypical case presentation. Epidemiological investigations in which contact tracing can be conducted and suspicious clusters of cases can be distinguished from the background noise of common illnesses may not be feasible in conflict areas. It is also important to remember that the practical utility of early detection will be heavily dependent on the speed with which systems of surveillance can operate. Accordingly, strong, responsive communication networks are essential for early outbreak detection, both for coordinating the requisite investigations as well as for integrating data derived from various sources. Civil wars commonly disrupt traditional means of communication. New strategies that utilize satellite or other technologies to link remote or insecure areas to surveillance are needed.

The Ebola virus outbreak in West Africa exposed glaring weaknesses in the global strategy to control pandemic outbreaks in areas with minimal public health capacity. The local failures were myriad and have been documented by a variety of post-outbreak assessments.<sup>9</sup> The detection and reporting of the outbreak was delayed for months because of inadequate health services and poor communication among clinicians and public health authorities. Health facilities were quickly overwhelmed by the rising number of patients with Ebola and large numbers of health workers became ill and died. Many facilities were shuttered or restricted their services to patients with suspected Ebola infection. Consequently, it is likely that, during the outbreak, many more deaths resulted from inadequate care for patients with illnesses other than Ebola. The health care provided to patients with Ebola was substandard early on, which not only led to unnecessary deaths, but also enhanced transmission.

Virtually all the post-Ebola appraisals were quick to emphasize that weak nation-

al health systems were a key contributor to the deeply flawed response to the outbreak. While these reports called for enhanced financial support for strengthening national health systems, current global health security structures continue to place the responsibility for improving these systems on the national governments themselves. Clearly, this approach is problematic for countries plagued by civil war. It is useful, therefore, to examine these global health security systems and why they rely so heavily on the commitment and capacities of the affected countries and why this is not likely to change anytime soon.

The only comprehensive global framework for pandemic detection and control is the legally binding international treaty, the International Health Regulations (IHR).<sup>10</sup> Currently covering 196 nations, the IHR have their historical roots in the early nineteenth-century sanitary codes, developed after a series of cross-border epidemics in Europe underscored the need for international public health standards and cooperation. The United Nations created the World Health Organization (WHO) in 1948, which had built into its constitution the authority to craft regulations directed at “sanitary and quarantine requirements and other procedures designed to prevent the international spread of disease.” In 1951, the WHO consolidated a number of earlier health agreements and renamed them the International Sanitary Regulations (ISR). A revision of the ISR was adopted in 1969 and renamed the International Health Regulations. Significantly, the IHR were, as were their predecessor agreements, directed at the dual goals of reducing the international spread of infectious diseases and the avoidance of unnecessary burdens on the flow of international trade and transportation. However, the inadequacies of the IHR during several outbreaks in the early 1990s prompted the WHO to initiate a re-

vision process in 1995. However, the revisions only moved to the front burner after the 2002 outbreak of SARS, which began in the Guangdong Province of China but quickly spread to some two dozen countries in North America, South America, Europe, and Asia and had an estimated short-term, economic cost of about \$50 billion.<sup>11</sup> China's failure to report the outbreak in a timely manner and prolonged resistance to international cooperation in mounting a global response only underscored the urgent need to revise the IHR.

The revision was ultimately adopted in 2005 and addressed several significant deficiencies, including the glaring problem that the IHR only attended to outbreaks from three diseases: cholera, yellow fever, and plague. Interestingly, these were the same three diseases that were addressed by the original European sanitary regulations adopted in the 1800s. The 2005 revision expanded the purview of the IHR to include all outbreaks that posed a "public health risk" or a "public health emergency of international concern." In addition, the 2005 revision allowed the WHO to obtain and use data from nongovernmental sources. This provision recognized that information from member states might not be accurate, either because of inadequate data collection capabilities or in response to the political and economic repercussions states might encounter by reporting an outbreak. The 2005 revision also attempted to address the fact that many national public health systems do not possess even the most rudimentary capabilities to detect, respond to, and report an infectious outbreak. However, the burden was placed on the states themselves to improve their systems and report progress on a regular basis to the WHO. Additionally, the 2005 revision inserted concerns for human rights into the regulations and created a mechanism by which the WHO could authorize the declaration of a Public Health Emergency of International

Concern (PHEIC), which is a formal call to adopt WHO recommendations and to coordinate the responses of member states, but, significantly, it imposes no binding obligations on state action.<sup>12</sup>

The IHR (2005) required that states report the status of their health capacities and imposed a deadline of 2012 for all states to have in place the necessary capacities to detect, report, and respond to local infectious outbreaks. However, only a small percentage of state parties reported meeting these requirements and almost one-third did not even provide the requisite capacity information when surveyed by the WHO. Prior to the outbreak, Sierra Leone reported inadequate progress in meeting IHR capacity goals; Liberia and Guinea were among the countries that failed to report their status.<sup>13</sup> Post-Ebola recommendations have stressed the need for greater external assessment and the linkage of international funding for health system strengthening to more rigorous evaluation and reporting.<sup>14</sup> However, even with enhanced funding and accountability provisions, the low probability that weak states, and particularly those plagued by civil conflict and protracted violence, will make the requisite improvements in their own health systems represents a dramatic vulnerability in the global health security system.

Despite calls to strengthen general health system capacities, a major component of foreign assistance initiatives concerned with pandemic control are focused specifically on enhancing just those capabilities needed for pandemic surveillance, detection, and response. The United States Agency for International Development (USAID) and the CDC have been working to improve local pandemic detection and response capacities by directing resources and training to twenty countries thought to be at high risk for pandemic emergence, including the Democratic Republic of the Congo.<sup>15</sup>

The Emerging Pandemic Threats Program (EPT-2) has supported a variety of projects designed to develop data and build capacity in surveillance and response. A broader global effort, the Global Health Security Agenda, has been endorsed by the G7 (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) as means for bringing together a variety of health and veterinary agencies within a One Health framework and improving accountability for the status of national pandemic control systems.<sup>16</sup>

The underlying premise of these focused initiatives in places like the DRC is that what is needed for effective pandemic control is not good governance per se but “good enough governance” or “strategic governance” in which the minimal governance and security conditions required by the technical elements of pandemic control are met.<sup>17</sup> Strategic governance for health service provision contends that each technical intervention places distinct burdens on governance and system capacity. For example, an immunization program may require different things from local governance capacities than a maternal mortality reduction initiative. This may clarify why, in unstable regions, specific domains of health outcomes can improve while others plateau or worsen. For example, Liberia experienced dramatic declines in young-child mortality over the past decade. However, its response to Ebola was catastrophically ineffective. Other examples include the success of large-scale antiretroviral medication programs in the central plateau of Haiti, immunization programs in Somalia, and dramatic reductions in maternal-to-child transmission of HIV infection in Zimbabwe.

Support for the potential utility of a strategic approach has also come from the successful containment of Ebola in Nigeria, a country deeply troubled by corruption, political and ethnic tensions, and, in cer-

tain areas, a running insurgency.<sup>18</sup> In July 2014, a Liberian-American diplomatic traveler, who had been infected with Ebola virus in Liberia, traveled to Lagos, a megacity of almost eighteen million people. The virus was subsequently transmitted to others in Lagos and in Port Harcourt, the home of Nigeria’s international oil refining and export industry. However, just two months after the first case was identified, no new cases were reported in Nigeria. This experience would suggest that, indeed, pandemic control can be successfully implemented in countries with weak health systems and low government effectiveness. However, on deeper examination, there were special conditions in Nigeria that may not be representative of conditions in other areas of weak governance or chronic conflict. Because Nigeria was one of the few remaining countries in the world still experiencing cases of polio, a significant investment had been made beginning in 2012, particularly by the Bill and Melinda Gates Foundation, to develop an extensive system of polio surveillance and response.<sup>19</sup> With the detection of the first case of Ebola, this system of highly trained supervisory staff, hundreds of field operatives, communication networks, and specialized equipment were immediately shifted to support the outbreak control apparatus in the affected Nigerian cities. The presence of this polio eradication infrastructure was likely crucial to the relatively swift and successful response to Ebola in Nigeria. This would suggest that a strategic investment in specific health and governance capacities can prove effective in certain settings. Similar polio eradication initiatives have been developed in Pakistan, another country plagued by civil conflict. Nevertheless, it is useful to note that the polio eradication infrastructure required considerable time to develop and substantial external investments. Therefore, the Nigerian experience with Ebola may not reflect the likely capacities of other political-

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ly complex, low-income countries attempting to control a serious infectious outbreak.

The vulnerability generated by weak national health capacities is not confined to issues of health. Rather, if there is a perception that a country is either unwilling or unable to deal with a potential pandemic outbreak, a series of serious security concerns can quickly emerge. The IHR do not require that any state implement WHO recommendations, permit entry to WHO technical teams, or accept international assistance. “Soft” compliance mechanisms have been adopted that attempt to enhance the incentives for state compliance, but cannot compel fulfillment of WHO guidance. For example, the WHO can publicize the failure of states to abide by WHO recommendations and openly articulate the presumed consequences of resisting international assistance. The IHR also permit the WHO to seek data on outbreaks from non-governmental sources for the first time.<sup>20</sup> This provision was adopted, after considerable negotiation with concerned state parties, in the hope of encouraging host states to provide more timely and accurate data on the status of outbreaks. There have also been recent efforts to enhance state reporting of health system capacities through supplementary independent voluntary assessments of countries working through the Global Health Security Agenda consortium.

The bottom line, however, is that despite the profound global threat of pandemics, there remains no global health mechanism to force state parties to act in accordance with global health interests. Moreover, there also persist inherent disincentives for countries to report an infectious outbreak early in its course. The economic impact of such a report can be profound, particularly for countries heavily dependent upon tourism or international trade. China hesitated to report the SARS outbreak in 2002. Tragic delays in raising the alarm

about the Ebola outbreak in West Africa were laid at the doorstep of the affected national authorities and the regional WHO committees, which were highly concerned about the economic and social implications of reporting an outbreak.<sup>21</sup>

Countries experiencing civil wars may not be particularly worried about disruptions to tourism or international trade. However, the deference to sovereignty claims in the IHR has also had a significant impact on the detection and response to infectious outbreaks in these areas. Syria had not reported a case of polio since 1999. In 2013, health workers began to see young children presenting with the kind of paralysis that is generally associated with a polio outbreak, which is highly contagious and is considered a public health emergency. However, the government and the regional WHO office have been intensely criticized for their slow and uneven responses.<sup>22</sup> It was noted early in the outbreak that the cases were concentrated in areas controlled by groups opposed to the Assad regime. This was not particularly surprising given that these areas had experienced a deterioration in general living conditions as well as the government’s abandonment, if not active destruction, of sanitation and water supplies, two primary means of polio virus dissemination. In addition, government-sponsored immunization services for children had also eroded badly in these areas. The Assad regime has been accused of hesitating to confirm early reports of polio in the opposition areas and impeding the delivery of vaccines and health workers to those locations. The WHO was also criticized for its lack of quick response, although its hands were somewhat tied by the mandate that it act only after receiving the assent of the national government. Ultimately, with pressure from international health organizations and neighbors in the region (Jordan, the West Bank, and Israel detected the polio virus in sewage presumably coming from



Syria), a major polio vaccination campaign was implemented involving the government health infrastructure in the south of the country and a consortium of both international and local nongovernmental organizations in the north. This strategy apparently terminated the outbreak and remains the only way to provide immunizations in both governmental-held and rebel-controlled areas of Syria.<sup>23</sup>

The Syrian polio outbreak is an important reminder that health interventions, though technical in nature, can be transformed into political currency when certain conditions are met. At the most basic level, the destruction or withholding of essential health capabilities can be used to coerce adversaries into political compliance, if not complete submission. The purposeful Syrian and Russian bombing of hospitals and other health facilities in the besieged city of Aleppo is a representative, if especially brutal, expression of this explicit strategy. The intention was clearly to inflict profound suffering and amplify casualties: one dead doctor can result in many more dead among the unattended injured.

There are also important, though more subtle mechanisms by which the provision of health services can take on an intensely political character. In particular, three general conditions can define how health interventions ultimately relate to perceptions of political legitimacy: First, the population must perceive that an infectious outbreak represents a major threat. Second, the population must see health services as technically capable of successfully combatting the perceived threat. Third, the state must be viewed as being responsible for the provision of this technical capacity. When these conditions are met, the political legitimacy of the state will almost always be in play; political legitimacy can be undermined by nonprovision. Alternatively, when the state or its proxy, such as a UN agency or nongovernmental organization, is successful

in providing the health service in question, the state's political legitimacy may be enhanced. In this manner, the role of health services in creating state legitimacy can be intensely dynamic, particularly in violently contested political environments.

Regardless of how extensive the capacities of a health system appear on paper, the actual effectiveness of the system will almost always rest on whether the citizenry perceives the system as legitimate.<sup>24</sup> The lack of political legitimacy can undermine a health system's response in several critical ways: First, diminished political legitimacy can threaten informational authority. As was seen early in the Ebola outbreak, the official attempts to disseminate information on the nature and prevention of Ebola transmission were profoundly weakened by a general distrust of the state as a source of reliable information. While concerns regarding inappropriate cultural, linguistic, and literacy levels of the information likely also contributed to the lack of effect, the core problem was less the content than the source of the information. The authority of the state to provide critical, life-or-death information had to confront the fact that many at greatest risk of being infected by the Ebola virus did not believe the state prioritized their interests. Second, under certain conditions, local communities may attempt to insulate themselves from state authority. Particularly, where states have been perceived as predatory, the "art of not being governed" can produce protective practices and local political impulses that can expressly, or at least effectively, shield populations from state control, a situation that can undermine even the best-intentioned public health initiatives.<sup>25</sup> Third, and perhaps most important, weak political legitimacy can make state-propagated health activities increasingly reliant on coercion. Public health responses to an infectious outbreak will almost always depend upon public compliance with behav-

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ioral recommendations, such as quarantine. In settings of high political legitimacy, such compliance will reflect normative respect for state authority on such matters as public health. However, when legitimacy is low, normative respect can be replaced by skeptical noncompliance. In a setting of potential pandemic dissemination, skeptical noncompliance may not be tolerated by the state or threatened regional or international entities, and coercive tactics may seem the only recourse. In such situations, responsibility for the management of the outbreak may shift from the ministry of health to the army.<sup>26</sup> This shift in strategic authority was made clear to a global audience when Liberian security forces were utilized to impose what ultimately became a failed attempt to quarantine the crowded, impoverished West Point neighborhood of Monrovia, Liberia, at the height of the Ebola outbreak.<sup>27</sup>

The political currency of health services, particularly in areas of civil conflict, can also be wielded as a weapon of political advantage. This is most apparent when a service of clear political value is provided or withheld based on the behaviors of local populations. Standard counterinsurgency doctrine has made the provision of public goods, such as valued health services, a means of generating strategic support for a combatant force, the state, or its proxies.<sup>28</sup> When the conditions of perceived infectious threat, effective technical capacity, and state responsibility for access to this capacity are met, the direct provision of this service will tend to enhance the political legitimacy of the state. However, when the state fails to provide the service, its political legitimacy can be diminished. It should not be surprising, therefore, that health services may become vulnerable to assault by forces that oppose the state. Conversely, attacks on services of high value to local communities could undermine the legitimacy of the forces opposed to the state. There are

numerous examples of this dynamic. Most Jihadist forces in Iraq and Syria have supported immunization campaigns. Most Taliban fighters in Afghanistan have generally not attacked local health clinics, even those constructed by U.S. forces or supported by external nongovernmental organizations. However, there are also many counterexamples in which the struggle for legitimacy has put health workers at risk of politically motivated violence, as is evident by the continued targeting of Pakistan's polio immunization programs.<sup>29</sup> The U.S. Central Intelligence Agency's use of a Pakistani physician masquerading as an immunization worker to ascertain the whereabouts of Osama Bin Laden only enhanced the political utility of these attacks on state-sponsored vaccination teams. In Syria, the Assad regime and allied Russian forces have targeted health facilities and personnel in order to deprive civilian populations of adequate health care and thereby amplify the suffering and death associated with continued resistance.

Global pandemic control systems respect national sovereignty; infectious outbreaks do not. This mismatch of policy and biology is an inherent vulnerability of the current international health governance infrastructure, which can create a level of profound unpredictability in how states respond to pandemic threats. While these questions relate generally to the control of pandemics, they have special meaning in the context of civil conflict and violent political instability. Sovereignty is best considered as a composite of several component political standards.<sup>30</sup> Domestic sovereignty refers to the state's performance in regulating violence and exercising authority within its borders. Westphalian sovereignty refers to the autonomy of the state and its ability to exercise power without interference from external forces. International legal sovereignty involves the formal recognition of the state within the administration of in-

ternational organizations and law. Interdependence sovereignty relates to the ability of states to control threats emanating from regional or global processes that transcend national borders, such as climate change, air pollution, or the globalization of food production. By some measures, the vulnerabilities and contradictions within the global health security regimes reflect tensions between these different forms of sovereignty.

A series of calls for reforming global health governance have emphasized the inherent interdependence of states in addressing a variety of public health challenges.<sup>31</sup> Particularly, in the wake of the Ebola outbreak in 2013–2014, the risk of rapid cross-border dissemination of infectious diseases has questioned the IHR's basis in legal and Westphalian sovereignty claims, claims that may represent an outmoded map for navigating effective global pandemic control. The argument suggests that the epidemiologic challenge to interdependence sovereignty is so significant that some arenas of power traditionally rooted in legal or Westphalian sovereignty should give way to shared, global governance processes.<sup>32</sup>

The case for enhancing the power of global health agreements seems most compelling for risks emanating from areas of violent conflict. Here, minimal health system capacity, poor security, and suspect political legitimacy represent a heavily compromised domestic sovereignty. The maintenance of traditional Westphalian sovereignty claims in the face of a weak domestic sovereignty reality may prove particularly counterproductive, at least in meeting the requirements for pandemic control.<sup>33</sup>

This misalignment not only may make the global response to pandemic risk less effective, it may also create a potential gap between actions sanctioned by current global health governance agreements and the homeland security interests of regional and global powers. This tension has been

described as the conflict between two logics: the logic of appropriateness and the logic of consequences.<sup>34</sup> The logic of appropriateness emphasizes legal sovereignty and compliance with rules, roles, and behaviors prescribed in international agreements. The IHR reflect this approach, relying on the approval of all 196 member states. The logic of consequences recognizes the pragmatic behavior of political actors to maximize their own interests. While the logic of appropriateness and the logic of consequences are not incompatible, they can often diverge, particularly when domestic political concerns begin to dominate international behavior.

The fear of pandemic infectious disease can be a powerful driver of domestic politics. In response to the fears generated by the Ebola outbreak in 2014, a number of countries imposed harsh travel restrictions even though they violated protocols delineated in the IHR. In the United States, public fear and the resultant political environment set the stage for several state governors to disregard technical recommendations from the CDC and implement their own severe quarantine procedures. In such an atmosphere, domestic political pressures in accordance with the logic of consequences may result in meaningful departures from global health agreements developed in accordance with the logic of appropriateness.

It is also important to keep in mind the speed with which pandemics and, significantly, the fear of pandemics can spread. As these fears take hold, neighboring countries as well as states with a global military reach may experience growing domestic pressure to intervene. These pressures could force international actors to depart quickly from extant global health protocols and resort to direct intervention. Even if these interventions are directed at technical and health personnel, in areas of conflict, this assistance will likely require sufficient military capability to ensure the security of the

requisite health personnel and activities. As was noted in Haiti and Liberia, this security role can extend beyond the usual logistical responsibilities the military may have in settings of complex humanitarian emergencies. Moreover, because most civil wars reflect the proxy involvement of regional or global powers, the ad hoc nature of such health-instigated interventions could play into complex geopolitical agendas and potentially trigger unpredictable and destabilizing military confrontations.

The fundamental concern is that the global health security regimes may not attend to the requirements of homeland se-

curity and, ultimately, the demands of international order. The unpredictability of a serious infectious outbreak, the speed with which it can disseminate, and the fears of domestic political audiences can together create a powerful destabilizing force. Current discussions regarding global health governance reform have largely been preoccupied by the performance and intricate bureaucratic interaction of global health agencies. However, what may prove far more critical may be the ability of global health governance structures to recognize and engage the complex, political realities on the ground in areas plagued by civil war.

#### ENDNOTES

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<sup>1</sup> Centers for Disease Control and Prevention, “An Introduction to Applied Epidemiology and Biostatistics,” *Principles of Epidemiology in Public Health Practice*, 3rd ed. (Atlanta: U.S. Department of Health and Human Services, 2012), <http://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/section11.html>.

<sup>2</sup> Centers for Disease Control and Prevention, “One Health,” <https://www.cdc.gov/onehealth/> (accessed October 10, 2016).

<sup>3</sup> Brian L. Pike, Karen E. Saylor, Joseph N. Fair, et al., “The Origin and Prevention of Pandemics,” *Clinical Infectious Diseases* 50 (12) (2010): 1636–1640.

<sup>4</sup> Kate E. Jones, Nikkita G. Patel, Marc A. Levy, et al., “Global Trends in Emerging Infectious Diseases,” *Nature* 451 (2008): 990–993.

<sup>5</sup> Stephen S. Morse, “Factors and Determinants of Disease Emergence,” *Revue Scientifique et Technique* 23 (2) (2004): 443–451.

<sup>6</sup> Stewart Patrick, “Infectious Disease,” in *Weak Links: Fragile States, Global Threats, and International Security* (Oxford: Oxford University Press, 2011), 207–241; Vegard Eldholm, John H. Petters-

- son, Ola B. Brynildsrud, et al., “Armed Conflict and Population Displacement as Drivers of the Evolution and Dispersal of *Mycobacterium tuberculosis*,” *Proceedings of the National Academy of Sciences* 113 (48) (2016): 13881–13886; and Stewart Patrick, “Civil Wars & Transnational Threats: Mapping the Terrain, Assessing the Links,” *Daedalus* 146 (4) (Fall 2017). Paul H. Wise & Michele Barry
- 7 Pike et al., “The Origin and Prevention of Pandemics.”
- 8 Emily H. Chan, Timothy F. Brewer, Lawrence C. Madoff, et al., “Global Capacity for Emerging Infectious Disease Detection,” *Proceedings of the National Academy of Sciences* 107 (50) (2010): 21701–21706.
- 9 Suerie Moon, Devi Sridhar, Muhammad A. Pate, et al., “Will Ebola Change the Game? Ten Essential Reforms before the Next Pandemic: The Report of the Harvard-LSHTM Independent Panel on the Global Response to Ebola,” *The Lancet* 386 (10009) (2015): 2204–2221; and David L. Heymann, Lincoln Chen, Keizo Takemi, et al., “Global Health Security: The Wider Lessons from the West African Ebola Virus Disease Epidemic,” *The Lancet* 385 (9980) (2015): 1884–1899.
- 10 David P. Fidler, “From International Sanitary Conventions to Global Health Security: The New International Health Regulations,” *Chinese Journal of International Law* 4 (2) (2005): 325–392.
- 11 Richard J. Coker, Benjamin M. Hunter, James W. Rudge, et al., “Emerging Infectious Diseases in Southeast Asia: Regional Challenges to Control,” *The Lancet* 377 (9765) (2011): 599–609.
- 12 Fidler, “From International Sanitary Conventions to Global Health Security.”
- 13 Trygve Ottersen, Steven J. Hoffman, and Gaëlle Groux, “Ebola Again Shows the International Health Regulations Are Broken: What Can Be Done Differently to Prepare for the Next Epidemic?” *American Journal of Law & Medicine* 42 (2016): 356–392.
- 14 Lawrence O. Gostin and Eric A. Friedman, “A Retrospective and Prospective Analysis of the West African Ebola Virus Disease Epidemic: Robust National Health Systems at the Foundation and an Empowered WHO at the Apex,” *The Lancet* 385 (9980) (2015): 1902–1909.
- 15 United States Agency for International Development, *Emerging Pandemic Threats Program – EPT-2: 2014–2019* (Washington, D.C.: United States Agency for International Development, 2014), 1–24, <https://scms.usaid.gov/sites/default/files/documents/1864/EPT2-Narrative-508.pdf>; and United States Agency for International Development, “Emerging Pandemic Threats,” <https://www.usaid.gov/news-information/fact-sheets/emerging-pandemic-threats-program> (accessed May 2, 2017).
- 16 Global Health Security Agenda, “About,” <https://www.ghsagenda.org/about>.
- 17 Merilee S. Grindle, “Good Enough Governance Revisited,” *Development Policy Review* 25 (5) (2007): 553–574; and Paul H. Wise and Gary L. Darmstadt, “Strategic Governance: Addressing Neonatal Mortality in Situations of Political Instability and Weak Governance,” *Seminars in Perinatology* 39 (5) (2015): 387–392.
- 18 Chima Ohuabunwo, Celestine Ameh, Oyin Oduyebo, et al., “Clinical Profile and Containment of the Ebola Virus Disease Outbreak in Two Large West African Cities, Nigeria, July–September 2014,” *International Journal of Infectious Diseases* 53 (2016): 23–29.
- 19 Joseph C. Okeibunor, Martin C. Ota, Bartholomew D. Akanmori, et al., “Polio Eradication in the African Region on Course Despite Public Health Emergencies,” *Vaccine* 35 (9) (2017): 1202–1206.
- 20 Fidler, “From International Sanitary Conventions to Global Health Security.”
- 21 Gostin and Friedman, “A Retrospective and Prospective Analysis of the West African Ebola Virus Disease Epidemic”; and Philippe Calain and Caroline Abu Sa’Da, “Coincident Polio and Ebola Crises Expose Similar Fault Lines in the Current Global Health Regime,” *Conflict and Health* 9 (29) (2015).
- 22 Calain and Abu Sa’Da, “Coincident Polio and Ebola Crises Expose Similar Fault Lines in the Current Global Health Regime”; and Annie Sparrow, “Syria’s Polio Epidemic: The Suppressed

- Truth,” *The New York Review of Books*, February 20, 2014, <http://www.nybooks.com/articles/archives/2014/feb/20/syrias-polio-epidemic-suppressed-truth/?pagination=false>.
- <sup>23</sup> R. Bruce Aylward and Ala Alwan, “Polio in Syria,” *The Lancet* 383 (9916) (2014): 489–491.
- <sup>24</sup> Stephen D. Krasner and Thomas Risse, “External Actors, State-Building, and Service Provision in Areas of Limited Statehood: Introduction,” *Governance* 27 (4) (2014): 545–567.
- <sup>25</sup> James C. Scott, *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia* (New Haven, Conn.: Yale University Press, 2010).
- <sup>26</sup> Pietro Tornabene, *The Military Response to Pandemic: The New Global Threat* (Carlisle, Pa.: U.S. Army War College, 2009).
- <sup>27</sup> Norimitsu Onishi, “Quarantine for Ebola Lifted in Liberia Slum,” *The New York Times*, August 29, 2014, <https://www.nytimes.com/2014/08/30/world/africa/quarantine-for-ebola-lifted-in-liberia-slum.html?mcubz=0>.
- <sup>28</sup> David H. Petraeus and James F. Amos, *The United States Army and the United States Marine Corps: Counterinsurgency Field Manual* (Kissimmee, Fla.: Signalman Publishing, 2006); and David Killcullen, *Counterinsurgency* (Oxford: Oxford University Press, 2010).
- <sup>29</sup> World Health Organization, *Attacks on Health Care: Prevent, Protect, Provide* (Geneva: World Health Organization, 2015); and Slaman Masood, “Polio Team Attacked in Pakistan,” *The New York Times*, February 14, 2015, <https://www.nytimes.com/2015/02/15/world/asia/attack-on-polio-vaccination-team-in-pakistan-leaves-one-dead.html?mcubz=0>.
- <sup>30</sup> Stephen D. Krasner, *Sovereignty: Organized Hypocrisy* (Princeton, N.J.: Princeton University Press, 1999).
- <sup>31</sup> Moon et al., “Will Ebola Change the Game?”; Heymann et al., “Global Health Security”; Gostin and Friedman, “A Retrospective and Prospective Analysis of the West African Ebola Virus Disease Epidemic”; and Julio Frenk and Suerie Moon, “Governance Challenges in Global Health,” *The New England Journal of Medicine* 368 (2013): 936–942.
- <sup>32</sup> Francesco Checchi, Ronald J. Waldman, Leslie F. Roberts, et al., “World Health Organization and Emergency Health: If Not Now, When?” *The BMJ* 352 (469) (2016).
- <sup>33</sup> See Hendrik Spruyt, “Civil Wars as Challenges to the Modern International System,” *Dædalus* 146 (4) (Fall 2017).
- <sup>34</sup> James G. March and Johan P. Olsen, *Rediscovering Institutions: The Organizational Basis of Politics* (New York: The Free Press, 1989).