Pandemics and National Security

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Abstract

Traditionally, national security has been narrowly defined as the preservation of the state from physical threats. Still, emerging diseases and their pandemic potential pose perhaps an even greater national security threat, particularly in this era of globalization when disease can spread more rapidly than in previous eras. Thirty four percent of all deaths worldwide are now attributable to infectious disease, while war only accounts for 0.64 percent of those deaths. Moreover, the Spanish flu epidemic of 1918 killed approximately 500,000 Americans, more than all wars fought in the 20th century. Improving detection through biosurveillance is the key to stopping epidemics and the United States must increase its funding and focus on improving both domestic and global biosurvellance capability. Additionally, reducing disease transmission through public education and related measures is also crucial to minimizing pandemic impacts.

Key terms: Africa, biosurveillance, bioterrorism, infection, national security, and pandemic.

Introduction

Traditionally, national security has been narrowly defined as the preservation of the state from physical threats. The last 50 years has seen sharp rises in more non-traditional threats, such as terrorism, drugs, ethnic cleansing, and disease. Emerging and re-emerging diseases, and their pandemic potential, pose a challenge to national security in the 21st century that cannot be ignored. The growing HIV/AIDS epidemic and recent outbreaks of viruses like Influenza H1N1 (2009) and SARS are just a few examples of diseases that can profoundly threaten the physical integrity of a state. In todayôs globalized society, preparedness ï not prevention ï is the solution to this escalating problem. National security must be redefined for a new era where conventional war is no longer the primary physical threat to a state; instead, the focus must shift to include threats from disease that challenge the interests of the United States abroad, and the safety of its citizens at home.

The historical threat to national security by epidemic disease is not new, though the threat has increased and is growing rapidly. Consider the effect of Smallpox on the indigenous peoples of North America. Many argue that they were not conquered by superior weaponry or forces, but by their lack of natural immunity to European diseases. In *Plagues and Peoples*, William McNeill states:

> Ingenuity, knowledge, and organization alter but cannot cancel humanityôs vulnerability to invasion by parasitic forms of life. Infectious disease which antedated the emergence of humankind will last as long as humanity itself, and will surely remain, as it has been hitherto, one of the fundamental parameters and determinants of human history. (291)

One well-known example is the effect of the Black Plague on medieval Europe, setting civilization back a few centuries as the continent struggled to recoup. Furthermore, the great historian Thucydides ñdescribes how, during the Peloponnesian Wars, disease demoralized the Athenian people, undermined the political leadership, and weakened the army, preventing it from achieving key military objectivesò (Peterson 45). It is not only the general population that is threatened by disease, but the military as well. History can provide many such situations that demonstrate the devastating effects of disease.

The scope of the disease problem is demonstrative of why nations should be concerned. According to the World Bank, of the nearly 50 million worldwide deaths in 1990, 34.4% were due to infectious disease, while war was only responsible for 0.64% (Price-Smith 2). The Spanish Flu pandemic of 1918 killed more Americans in one year than in all 20th century U.S. conflicts combined. Clearly, disease presents a far greater threat to the physical security of Americans than war ever has. The HIV/AIDS epidemic is even more worrisome; data obtained from the *AIDS epidemic update 2007* shows that by this point in time, global AIDS deaths had reached approximately 20 million and continued to rise.

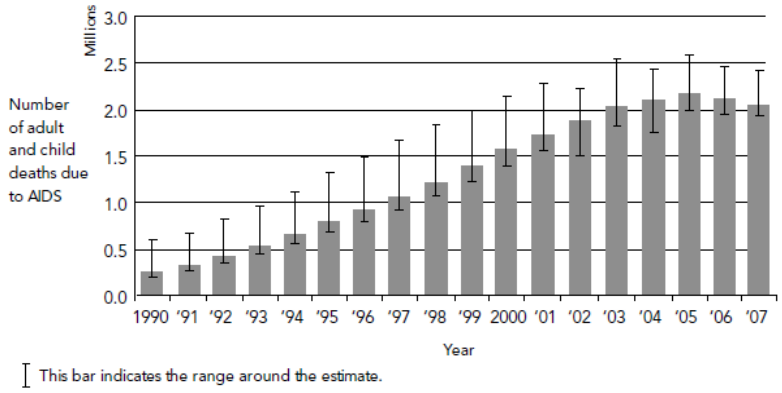

Figure 1 ï Estimated number of deaths due to AIDS globally, 1990-2007

While incidence rates in the U.S. remain relatively low, the potential for pandemic exists, in addition to the growing crisis in Sub-Saharan Africa and Russia.

Recent developments in medicine, hygiene, and public health have virtually eliminated widespread disease from industrialized countries like the U.S., making pandemics of new or emerging diseases the salient national security issue. A pandemic is an epidemic spread over a wide geographical area and affecting many people, and while a pandemic does not threaten the survival of humanity, it challenges the prosperity and stability of political institutions and human society. Andrew Price-Smith argues that ñrapid worldwide changes may accelerate the diffusion, the lethality, and the resistance of the plethora of species within the microbial worldò (5). For instance, changes in agricultural practices have created new ecological niches for disease ï vast bovine, avian, and swine farms, in huge numbers and often in close proximity that can facilitate

cross-species infection. Transportation of persons, animals, and food products around the world also presents a serious problem. New pathogens are emerging at an increasingly accelerated rate; ñAlteration in the processing of cattle feed in the U.K. resulted in extended host range and emergence of [mad cow disease]é New opportunities can be created by climatic changes such as global warming and ecologic alterations facilitated through changed land use and movements of infected hosts, susceptible animals, or disease vectorsò (Cutler 2). A disease can change in several important ways: it can jump to a new species (swine to human), change transmission method (blood-borne to aerosol dispersion), become more lethal, or become drug-resistant (Methicillin-resistant *Staphylococcus aureus* ï MRSA). Emerging diseases or those thought to be wiped out are becoming more of an issue with globalization and changing societal practices.

There are many ways diseases can threaten national security. First, they cause increased rates of morbidity and mortality ï people sicken and die, putting huge strains on public health and the nationôs workforce, leading to political instability, class strife, and economic volatility. For example, AIDS has led to numerous problems in many African countries. When marginalized or poor people cannot afford treatment and the government cannot or will not provide it, faith in the political system crumbles; class and ethnic conflict emerges and without a sufficient working class, GDP decreases and each problem begets more problems. Second, in the article ñEpidemic Disease and National Security,ò author Susan Peterson argues that the most direct threat posed by a disease to the United States arises from its vulnerability to biological weapons attack (45). It is important to note that the result of a naturally spreading disease and something like bioterrorism is one and the same. Failure to prevent a biological weapons attack results in the same outcome ï infection of the population ï and requires the same solution. Preparation for widespread disease should therefore be a key focus of national security. More indirect threats to national security include ñthe health of the armed forces and, most significantly, to the social, economic, and political stability of certain key regions ï especially Russia ï that also challenge American securityò (Peterson 46). In this sense, diseases lower the ability of the State Department or the Department of Defense to adequately provide international security to the United States. Both internal and external national security is threatened by the spread of disease.

In October 2009, the Center for Biosecurity of UPMC organized a conference that addressed many of the issues pertaining to the threat of biological weapons attacks. The Director of the Center referenced a recent National Intelligence Estimate that identified bioterrorism as the intelligence communityôs most important WMD concern, because ñthe knowledge, equipment, and pathogens required to construct a biological weapon are now globally dispersed, and there is no single technological methodology chokepoint or process that can be regulated to prevent the development of biological weaponsò (Gronvall 433). For many of the reasons listed so far in this paper, the outcome of a biological attack is particularly worrisome, necessitating a closer examination of malicious bio-threats. Unlike nuclear technologies, biological materials and information are easy to obtain, and the nature of biosciences is such that equipment, expertise, and infrastructure in the field supports an important function to society and cannot, nor should it, be limited. Any attempt to prevent the development of biological weapons would also limit much needed medical advancements. The CDC defines a bioterrorism attack as ñthe deliberate release of viruses, bacteria, or other germs (agents) used to cause illness or death in people, animals, or plantsò (CDC/Bioterrorism). These agents have a high potential for abuse by terrorist groups for several reasons. First, a disease can be difficult to detect due to the incubation

period between when an individual is infected and when symptoms begin to show. Second, the dispersion capability of some diseases allows a wider range of influence than an explosive device. Third, one bioweapon can have a multiplicative effect ï although only 100 people are initially infected, with a disease like smallpox, each person can then infect multiple other people, who in turn pass it on to even more. Outside the anthrax attacks of 2001, the U.S. has yet to experience a serious confirmed bioterrorist attack. However, this does not mean the threat should be minimized until an incident such as 9/11 acts as the catalyst; biological weapons are a direct threat to national security.

Of the more indirect threats to U.S. national security, there are three mechanisms through which infectious diseases cause instability within a foreign nation of the outbreak of military conflict. Peterson describes these as the balance of power among adversaries, health and human rights policy conflicts, and domestic instability (55). The first and most obvious mechanism involves one side of a dispute or conflict disproportionately suffering from a disease, leading to an imbalance of power and a possible preemptive attack. If a nationôs military capabilities are strongly affected by AIDS, this can present a vulnerable weakness. However, as with all three causal mechanisms, this type of situation will generally only occur when a pandemic is particularly severe or when the involved nations are unstable to begin with; this can be seen in warring African states with high HIV/AIDS incidence rates. The second mechanism concerns policies in response to an outbreak. For example, a nation may restrict freedom of movement and goods, or impose involuntary quarantine of infected individuals. While these policies likely will not cause conflict, they can lead to social and economic volatility if the practices persist. The third and most important mechanism is domestic instability. Consider AIDS, which largely affects people in their most economically productive years, and leads to the destruction of a countryôs workforce, diminished productivity, and a dwindling professional and middle class (Peterson 59). Furthermore, the AIDS crisis is leaving behind a generation of orphans which the CIA says are ñunable to cope and vulnerable to exploitation and radicalization,ò as seen by the violence of alienated youths in Zimbabwe (Peterson 61). All of the examples above are representative of a critical pattern; as Price-Smith writes, ñinfectious disease may in fact contribute to societal destabilization and to chronic low-intensity intrastate violence, and in extreme cases it may accelerate the processes that lead to state failureò (121). The U.S. should be concerned on the level of national security, because it has been demonstrated repeatedly that failed states foster terrorism, regional instability, and often necessitate foreign aid and humanitarian assistance.

Throughout the world, there are many deadly infectious diseases. There are two ways of thinking about these diseases that can help focus efforts on national security ï diseases that threaten under-developed countries, whether on a small or large scale, and diseases that threaten to become a catastrophic health event (pandemic) to the U.S. and other industrialized nations. Outside the U.S., cholera, tuberculosis (TB), malaria, dengue fever, pneumonia, diarrheal diseases and AIDS are just a few of the diseases responsible for over half of all deaths in developing nations. The U.S. is more concerned with diseases poised to become the next AIDS: drug resistant strains of existing infections, and new or newly mutated strains of influenza. Tuberculosis, malaria, dengue fever, HIV/AIDS, MRSA, and influenza will be discussed in more detail.

Tuberculosis is caused by a bacterium that usually attacks the lungs, and untreated can be fatal. Over one third of the worldôs population is infected; each year 9 million become sick with tuberculosis, resulting in 2 million TB-related deaths (CDC/TB). It is especially concerning because TB is relatively easy to treat, but since much of the world has no access to the necessary drugs, it continues to be a problem. Furthermore, tuberculosis is one of the leading causes of deaths amongst those infected with HIV, due to their weakened immune system.

Another disease common in developing countries is malaria, caused by a mosquito-borne parasite. It causes high fevers, shaking chills, and results in illness and death if untreated. The CDC reports that only 35 countries account for 98% of global malaria deaths; malaria was responsible for over 1 million deaths in 2008 and is second only to AIDS as the leading cause of death in Africa (CDC/Malaria). Tuberculosis and Malaria often represent as co-infections with AIDS, to the extent that any attempt to curb the AIDS crisis must also address these diseases. Part of the reason AIDS is so deadly in developing nations is because of these infectious but *treatable* secondary diseases. Dengue Fever is another mosquito-borne disease, a virus that infects 100 million worldwide each year, but which the CDC estimates can result in mortality less than 1% of the time with proper medical care (CDC/Dengue). It causes high fever, severe headaches, and hemorrhaging throughout the body; Price-Smith notes that it has ñreestablished itself in Central America and Mexico and is currently making inroads in to the southern United Statesò (8). Though it has existed in southern Asia since the early 1950s, the first epidemic in the Americas wasnôt reported to the CDC until 1981, and has since expanded there to over 18 countries. While malaria and dengue pose little threat to industrialized nations like the U.S., they are critical examples of the next types of disease poised to become a pandemic. Like HIV, they are zoonoses, microbiologic infections obtained from animals. ñAn estimated 60% of emerging human pathogens are zoonotic. Of these pathogens, >71% have wildlife originsò (Cutler 1). Globalization, changing agricultural practices, climate change, and human encroachment upon wildlife habitats has opened the door for new zoonotic infections to take hold. Remember, AIDS was only identified barely 30 years ago ï what will be the next pandemic?

Acquired Immunodeficiency Syndrome, AIDS, was first identified in the U.S. in 1981 (although retrospective immunology showed the virus was being transmitted epidemically by the late 1970ôs); the causative agent, HIV-1 virus, was found to have occurred in the Democratic Republic of the Congo in 1959 (CDC/HIV). Today, there is no vaccine and antiretroviral treatments can at best delay the onset of death. While incidence rates of HIV/AIDS remain low in the U.S., several countries of strategic importance are experiencing an epidemic of AIDS that will soon threaten their stability and in turn cause global instability. A little known fact is that AIDS is spreading faster in Russia than in any other country in the world, including many of the African nations. It is aggravating Russiaôs projected population decrease, will ñsignificantly reduce worker output and decimate the working age populationò, and if the AIDS trend continues, ñRussiaôs future GNP will remain stagnant through 2025ò (Peterson 66). This will in turn lead to regional volatility and further exacerbate Eastern Europeôs economic difficulties. A worst case scenario for national security in the future, ñAIDS could further erode Russiaôs ability to staff a conventional army and potentially lead Moscow to rely more on a deteriorating nuclear force to maintain its great power statusò (Peterson 66). In an increasingly global economy and international dependence, the collapse of Russia could profoundly affect the rest of the world. A similar situation in China would cause even more problems; however, China has the resources

and the population to likely absorb and recover from the AIDS crisis. Nevertheless, the spread of HIV/AIDS is and will remain a critical security issue to U.S. policymakers.

Instead of TB, malaria, or AIDS, industrialized nations are more concerned with drug resistant strains of bacterial diseases or viral infections for which there is no effective vaccine. Methicillin-resistant *Staphylococcus aureus* is a type of skin infection resistant to multiple types of antibiotics. It most often occurs among people in healthcare facilities and hospitals, who are then subject to other secondary infections, like pneumonia, which often result in death. According to the CDC, ñIn 1974, MRSA infections accounted for two percent of the total number of staph infections; in 1995 it was 22%; in 2004 it was 63%... 94,360 invasive MRSA infections occurred in the U.S. in 2005; 18,650 of these were associated with death,ò a higher total in that year that all AIDS deaths in the United States (CDC/HA-MRSA). This is but one example of many diseases, previously thought to be under control by modern medicine, but now are showing high resistance and running rampant within the healthcare community.

With the recent 2009 outbreak of Influenza H1N1, which the World Health Organization officially declared a global pandemic in June, the possibility of a flu pandemic has become a primary concern for the United States. Influenza is a virus that causes fever, coughing, aches, chills, fatigue, and in certain cases vomiting and diarrhea. According to *flu.gov*, there are two strains currently circulating throughout the U.S. ï seasonal flu and H1N1 (swine) ï with a third being closely watched overseas, H5N1 (avian). The *National Strategy for Pandemic Influenza Preparedness Plan – One Year Summary*, published by the Homeland Security Council, makes a serious case that

> Although the visibility of avian influenza and pandemic preparedness has waned in the media, the threat of avian influenza and the potential for an influenza pandemic has not. A pandemic occurs when a novel strain of influenza virus emerges that has the ability to infect humans and to cause severe disease, and where efficient and sustained transmission between humans occurs. Though we cannot be certain that *highly pathogenic avian influenza A H5N1* will spark a pandemic, we can be sure that a pandemic will occur at some point in the future. (1)

H1N1 acted as a catalyst that spurred the U.S. government into action to prepare for future pandemics that may be more lethal and more widespread. There are several examples throughout history that offer a glimpse of what a true influenza pandemic can do to a nation.

The most notable example is the 1918 Spanish influenza, which killed at least 25 million worldwide and approximately 500,000 Americans (Peterson 45). Normal, seasonal flu attacks the oldest and youngest of the population, those who are too weak to fight it off successfully. With a virulent strain such as the Spanish Flu, the incidence rate and mortality was highest among young adults aged 20 to 50 years (flu.gov). As such, it had an unheard of impact on armed forces abroad in Europe, severely impacting the war through the health of the military as well as the ability of the nation at home to produce the necessary wartime supplies. Two more pandemics to remember were the 1957 Asian Influenza (H2N2) and the 1968 Hong Kong Influenza (H3N2), which killed 2 million and 1 million worldwide, respectively. All three 20th century pandemics were Influenza type A viruses, leading experts to suggest that the ñminimum requirement seems to be a major change or shift in the HA antigen,ò which makes the virus unrecognizable by the human immune system (Kilbourne 12). Every large flu pandemic throughout recent history, and

several small epidemics, involved a different strain of the influenza virus that was generally more virulent, more widespread, and attacked young, healthy people. A recommendation first endorsed by the World Health Organization in 1969 ñassumes that the nature of the next pandemic virus cannot be predicted, but that it will arise from 1 of the 16 known HA subtypes in avian or mammalian species. Accordingly, preparation [of] viruses of all HA subtypes should proceed as soon as possible for potential use in vaccine production (Kilbourne 13). The next flu pandemic will likely be a reemergence of a strain previously seen, but with a critical new mutation that allows it to make the jump to pandemic levels of infection.

As originally outlined by President Bush in 2006, the *National Strategy for Pandemic Influenza Implementation Plan* established three goals for the U.S. government during a pandemic (1). First, stopping, slowing, or limiting the spread of a pandemic to the United States. Second, limiting the domestic spread of a pandemic to mitigate disease, suffering and death. Third, sustaining infrastructure and mitigating impact to the economy and society. H1N1 provided a valuable ñtest runò for the governmentôs response to a pandemic. They learned valuable lessons about what worked, what failed miserably, and what would have worked better with just a few improvements. These are summarized below (NSPIIP 2).

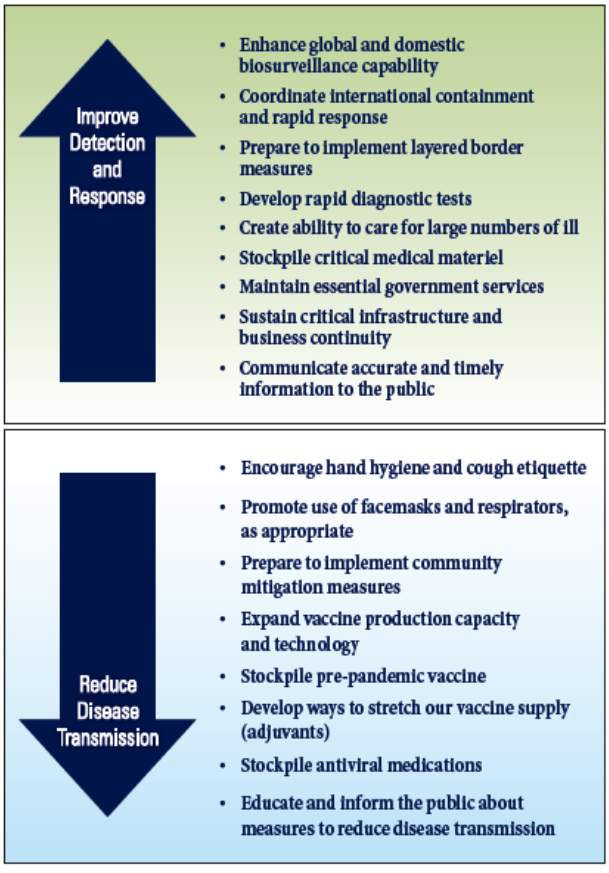

Figure 2 ï Methods for ñSafeguarding Our Healthò

Many of the above recommendations are interdependent across a variety of government agencies and private sectors of the economy. Responding to a pandemic will involve the State Department, Homeland Security, DOD, and the Department of Health and Human Services at a

minimum. Any future flu pandemic will not be contained solely within the U.S. and will quickly become global, necessitating international cooperation to mitigate the spread of the disease. Furthermore, anything related to vaccine development and production is governed by four major pharmaceutical companies, the only ones capable of producing the correct flu vaccines needed, and only one of which is based in the United States.

In Figure 2, the first bullet summarized, ñenhance global and domestic biosurveillance capability,ò deserves closer scrutiny. The National Biosurveillance Subcommittee has identified biosurveillance as critically important in the response to a catastrophic health event. Biosurveillance is defined as information ñneeded to ensure the nationôs ability to detect a biological event or other hazards to health that are of national significance promptly; to sustain near-real time situational awarenessé of such threats, and to provide decision-makers and the public with accurate and timely informationò (NBAS 1). Additionally, a RAND report from the National Defense Research Institute argues that ñto policymakers involved in public health and bioterrorism preparedness, the relationship between infectious disease and national security is now clear, and it creates a need for timely and accurate informationò (Cecchine xiv). To prepare for a future flu pandemic, the U.S. first needs a strong and well-developed information system to accurately identify emerging and existing threats. In the early stages of implementation is the National Biosurveillance Integration System (NBIS), which is an expansive database of health, environmental, agricultural, and intelligence data on biothreats. Only time will show how effective NBIS can be.

Whether or not United States biosurveillance succeeds, there remains a need for extensive preparation for a flu pandemic. Most preparation can be accomplished in the civilian sector, particularly in vaccine development and production, and improvement in the public health infrastructure. However, during an influenza pandemic the role of the Department of Defense is somewhat different. The previously mentioned *Implementation Plan* assigns four primary tasks to the DOD: assisting in disease surveillance, assisting partner nations (particularly through military-to-military assistance), protecting and treating US forces and dependents, and providing support to civil authorities in the United States (Kapp 3). Specifically, force protection is outlined as the DODôs first priority in the event of a flu pandemic, to ensure ñthe highest possible level of health support to DOD forces, civilian personnel, and beneficiaries as well as to protect and preserve DODôs worldwide operational effectivenessò (Kapp 5). To protect national security, the military must first see to its own capabilities before addressing the general population. As seen in the 1918 Spanish Influenza, a pandemic can cause two detrimental effects to national security ï the physical threat to U.S. citizens in terms of morbidity and mortality, and the decreased effectiveness of U.S. armed forces in protecting those citizens from external threats.

Once force protection is ensured, DOD members can respond to an official Request for Assistance, or can use Immediate Response authority to save lives, prevent suffering, and mitigate property damage (Kapp 7). Military aid can be crucial to disaster response, and has improved drastically since Hurricane Katrina, and the recent earthquake in Haiti. The *Implementation Plan*, and the *Emergency Support Function #8, Public Health and Medical Response Annex*, lists what military aid entails: providing transportation and evacuation, border control and security, supporting law enforcement, reconstruction of damaged facilities, and simple manpower for non-technical tasks (Kapp 7). In summary, the DOD can provide surge

capacity to existing pandemic response mechanisms. It cannot replace what is missing; the military can generally only supplement solutions already in place.

Infectious diseases threaten national security, both internally and externally. In particular, biological weapons attacks represent the most direct threat to national security. The U.S. and other industrialized nations must remain vigilant in today's globalized society, for disease can spread rapidly, quickly reaching pandemic levels. It can act as a trigger for social, political, and economic instability worldwide; specific diseases to be concerned about are HIV/AIDS, Influenza, drug-resistant strains of existing pathogens, several lethal killers in developing nations, and other zoonoses yet to emerge. Furthermore, prevention is not as important as *preparation* in limiting the spread or lethality of these diseases, and while the DOD can offer limited support in the event of a pandemic, the United States must develop vaccination capabilities and better public health infrastructure if it will be successful in safeguarding the national security of its citizens.

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