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# Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

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**Abstract**

In the wake of the 2014 Ebola outbreak, policy makers have focused on the public health components which led to the outbreak, the international response, efforts to control and mitigate the impact of the outbreak, and the research and development resulting from the pandemic. Some of the most enlightening aspects of the outbreak pertain to National Security, as the crisis demonstrated crucial failure within the United States to effectively respond to future pandemics or bioterrorist attacks. Upon a closer examination, the Ebola crisis demonstrated the American public's susceptibility to mass-panic, the lack of a centralized command structure, and the United States' inability to develop a pragmatic, centralized response to a biological incident. The lessons learned for this incident, offer a blue print for policymakers to consider, when crafting policy to respond to short comings in security policy.

**Introduction**

The 2014 Ebola pandemic, at first glance, is an interesting case study in public health. It demonstrates the many policy failures of public health organizations, as well as the ever-widening gap between the promise of modern medicine and the developing world. Upon further examination, however, the national security relevance of the outbreak becomes quite clear. In today's sophisticated and globally integrated economy, the public health concerns of one nation affect the wellbeing of others. With the constant transportation of goods and persons across international borders, the United States must pragmatically address public health and security concerns in conjunction.

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

The 2014 outbreak quickly escalated and grew into the deadliest Ebola outbreak the world has ever known, evolving into a national security priority for the United States (Obama, 2014). National security resources were allocated to help combat the spread of the virus within the African continent through the distribution of aid and expertise. Domestically, many security personnel were instrumental in screening ports of entry to prevent the proliferation of the disease throughout the western world. More importantly however, the "Ebola crisis" demonstrated the many vulnerabilities of the United States in regards to both policy and public psyche, which could be exploited in conjunction with a bioterrorism attack.

**Global Pandemics and National Security**

When trying to understand the link between national security and public health, it's important to note the difference between a pandemic and epidemic. An epidemic is an infectious outbreak which stays within a specific geographical area, and occurs when the number of infected persons rises well above what is expected within a city, county, state, or region (Nordqvist, 2016). When an epidemic is spread amongst people and spills across geographic borders, affecting several populations with the same infection, then the epidemic has elevated to a pandemic. Pandemic is derived from the Greek word, *pandemos*, meaning, "pertaining to all people," and is an outbreak of global proportions (Nordqvist, 2016). This is best demonstrated with the influenza virus, more popularly known as the flu. Influenza is a common virus with seasonal outbreaks (Nordqvist, 2016). Generally considered to be endemic in nature, influenza can evolve into a pandemic when a new strain (or subtype) emerges which people have no immunity against and thus are more susceptible to infection (Nordqvist, 2016). When a new virus or strand is discovered, the virus can quickly spread from person-to-person worldwide

because the human population has little or no immunity towards the infection (Department of Health, 2016). Pandemics are a naturally occurring biological tool of natural selection, used to prevent overpopulation (Galvani & Slatkin, 2003).

The devastating power of these naturally occurring events is evidenced in episodes such as the bubonic plague, which swept through Europe in the Middle Ages and claimed the lives of one-third of the total population; or the infamous influenza outbreak of 1918 (the Spanish flu) which killed an estimated 50 million people worldwide (Garrett, 2005). Many experts believe that we are overdue for another major flu pandemic. (Gupta, 2017). The current global HIV pandemic is estimated to affect more than 40 million people worldwide (Garrett, 2005). HIV has made an estimated 12 million children orphans and has killed nearly twice as many people (Garrett, 2005). The twentieth century brought tremendous growth in international trade and the most comprehensive redistribution of people, animals, animal products, and plants in human history (Jeffrey & Glarum, 2008). This century of integration and migration created new opportunities for the spread of viral outbreaks. Perhaps that is why the beginning of the new millennium has brought forth systematic viral scares: swine flu, bird flu, severe acute respiratory syndrome (SARS; reported in Asia in 2003), and Middle East respiratory syndrome (MERS; reported in Saudi Arabia in 2012). Each had one thing in common: the potential to evolve into a deadly global pandemic (Jeffrey & Glarum, 2008).

The spread of infectious disease presents more than just public health threats: pandemics threaten national security as well. Major global pandemics threaten national economies and transform population demographics (Garrett, 2005). Youth bulges or generation gaps created by outbreaks threaten human capital. In Africa, HIV is reducing working age populations faster than replacements can be educated and trained. In many cases, as a global society, the response to

these viral outbreaks has been emotionally driven and incredibly shortsighted (Garrett, 2005,). In an increasingly globalized world, no nation can be completely insulated from the social and economic impacts of global pandemics (Garrett, 2005).

Peter Salama, the Executive Director of the World Health Organization, emphasized the importance of ramping up "our preparedness," as a major pandemic will occur again (Selk, 2017). Cooperative strategies need to be implemented for dealing with global pandemics, but they should include enough foresight and adaptability to be applicable to any pandemic which may arise in the future. The national security concerns regarding global pandemics are quite clear, considering their devastating potential. This is why in 2000, the United Nations Security Council passed resolution 1308 in an attempt to check the rapid spread of the HIV virus (Garrett, 2005). The Security Council made the same declaration in September of 2014 amidst fears of a global Ebola pandemic (Garrett, 2015). While naturally occurring epidemics are devastating, these pale in comparison to intentionally created ones (Farmer, 2017). For this reason, the gravest security threat pertains to the threat of bioterrorism.

**The Ebola 2014 Outbreak**

The 2014 Ebola Outbreak is the deadliest Ebola outbreak to date. The Ebola virus disease (EVD) was first discovered in the Democratic Republic of Congo in 1976 (Salaam-Blyther, 2014). The virus is extremely dangerous, with the case fatality rate (the percentage of infected persons who do not survive the infection) exceeding 50% (Lister, 2014). The Ebola virus can only be transmitted through direct contact with body fluids, so despite its mortality rate, it is much harder to transmit than airborne virus's like influenza (Lister, 2014). Despite public fears

that it could, there was virtually no chance that the 2014 strand of EVD would ever become airborne (Haelle, 2014).

There are five known strands of the Ebola virus and the Zaire strand was responsible for the 2014 outbreak (Lister, 2014). The World Health Organization reported that by August 2014 there had been 2,615 infected cases (1,427 fatal). This is a staggering number, considering that in the 36 years since the discovery of the Ebola virus, there had been a total of 2,387 cases of infection (1,590 fatal) (Salaam-Blyther, 2014). Even though the virus was known and the particular strand identified, the outbreak in that one year was more infectious than all previous outbreaks combined (Salaam-Blyther, 2014).

At the time of the 2014 outbreak, there were no drugs in existence to cure the Ebola virus. A few courses of the experimental pharmaceutical Zmapp were developed for animal trials, in which the drug showed promise. In July of 2014, two American health workers who contracted Ebola in Liberia were given the drug which had not yet been tested on humans (Salaam-Blyther, 2014). Since the drug was in its experimental stage, there were no large quantities for mass treatment. With an estimated time of several years until a usable vaccine for Ebola could be developed and available, the Centers for Disease Control (CDC) emphasized that the best way to prevent the spread of the virus was to the practice strategies which prevented the spread of past outbreaks (Salaam-Blyther, 2014). These strategies included unravelling Ebola cases by isolating and caring for the infected patients and then building a chain of transmission to contain the spread of the virus (Frieden, 2014).

Previous Ebola outbreaks had traditionally occurred in the most rural parts of Africa. Paradoxically, the 2014 outbreak occurred, and sequentially spread more rapidly, in developed and urban portions of the country (Salaam-Blyther, 2014). The virus spread rapidly in nations

like Sierra Leone and Liberia- two countries with weakened infrastructures and health systems – worn out from decades of armed conflict. To truly help prevent the spread of Ebola, the process begins by improving the lives of those living in Africa (Taylor, 2014). Medical resources were inadequate in these nations unlike, the United States, where virtually any hospital in the country has the resources to perform basic Ebola isolation (Lister, 2014).

In the United States, the Centers for Disease Control (CDC) requested $45 million for the FY2015 budget for additional Ebola research, and USAID requested $50 million in funding to allocate to pandemic preparation through the Global Health Security Agenda (Salaam-Blyther, 2014). Through the available Overseas Contingency Operations funds, the Department of Defense delivered supplies, constructed Ebola treatment units, and trained the public on sanitation and mortuary practices to prevent the further spread of disease (Jansen, 2014).

Though the World Health Organization maintained that there was minimal risk of contracting the Ebola Virus through air travel, many airlines cancelled flights into infected nations (Salaam-Blyther, 2014). Nations revoked visas and refused to allow entry to travelers from infected regions (Salaam-Blyther, 2014). This was largely done in efforts to prevent mass hysteria. The Department of State reported that the threat of the virus, as well as the panic associated with it, had a negative impact on peacekeeping missions and security operations in Africa, even outside of the affected regions (Salaam-Blyther, 2014). The total international effort to combat the spread of Ebola was estimated to be nearly a billion dollars (Garrett, 2015). Private charities, aid distribution organizations, western governments, and military forces have all played a part in preventing the further spread of the virus (Garrett, 2015). With that said, the public in the infected African nations were also responsible for the role they played in quarantining infected persons and helping map the spread of the virus (Garrett, 2015).

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

**What is Bioterrorism?**

Biological warfare is not a new concept: it is an attack which "involves the purposeful creation of epidemics by enemy action" (Langmuir & Andrews, 1952). Accounts dating back to the Middle Ages depict the use of melee weapons like swords and spears being purposely infected with bacterial agents (Chiodo, 2015). During the twentieth century, the intended means of manufacturing epidemics evolved to include the distribution of aerosol pathogens or the contamination of water and food supplies (Langmuir & Andrews, 1952).

During the early part of the twentieth century, nation-states invested heavily in the weaponization of viral agents. Though treaties have been signed preventing the "lawful" use of biological weapons in warfare, this has not necessarily been effective. Syria under the Assad regime and Iraq under Saddam Hussein have both been accused of using these weapons in war. The Soviet Union covertly defied international treaties, continuing to invest millions of dollars in research on biological agents for warfare during the Cold War (Garrett, 2012). While these treaties have been drafted with the best of intentions, they still suffer from the lack of verification necessary to make them enforceable (Garrett, 2012). While policy makers have been conscientious of the threat caused by the proliferation of radiological and chemical agents, the threat of biological agents has been largely overlooked (Farmer, 2017).

A bioterrorist attack is the deliberate release of a germ agent – either viral of bacterial – with the intention of attacking people, animals, or crops (Bioterrorism, 2007). The only real difference between a bioterrorist attack and a biological warfare attack is the actor responsible for coordinating the attack and releasing the agent, and whether they are a nation-state or a non-governmental organization. The agents released are typically found in nature, but they can also

be altered to increase their resistance to medical treatments and enhance the communicability between populations (Bioterrorism, 2006).

To date, a very limited number of bioterrorist attacks have been executed. In 1984, members of the Rajneeshee cult infected 751 people with salmonella by sabotaging restaurants in the city of The Dalles, Oregon (Elmer-DeWitt, 2001). In 1993, the Japanese doomsday cult and terror organization, Aum Shinriky, release anthrax spores from an office building in Tokyo (Fletcher, 2012). The group attempted nine biological attacks in total (targets included U.S. Military bases), with diseases such as botulin, Q Fever, and cholera (Fletcher, 2012). In 2001, anthrax spores sent through the mail killed five people (Warrick, 2010). The limited scope of these attacks, may have downplayed the threat of bioterrorism to many.

Terror groups like al-Qaeda and ISIL (the Islamic State of Iraq and the Levant) have expressed interested, and have even attempted, to use biological agents in terror plots (Biodefense, 2016). The technical and administrative knowledge of biology and chemistry can be acquired globally in medical schools, research programs, and laboratories, making it difficult to prevent potential practitioners of bioterrorism from acquiring the required scientific knowledge (Chiodo, 2015). While at one time the ability to mutate strands was restricted to advanced research laboratories, rudimentary high school laboratories now have the ability to develop deadly biological agents (Garrett, 2012). With relative easy, terror groups could engineer the flu virus, making it deadlier (Selk, 2017). By combining traits of multiple strains and maximizing the virus' natural properties, it could become highly transmittable (Farmer, 2107). Genetically engineered viruses have the potential to kill more people than nuclear weapons, governments remain underprepared for that threat (Selk, 2017).

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

Terrorists could be drawn to the use of biological agents because of the difficulty of detection and the ease at which some biological agents can naturally spread through a population (Bioterrorism, 2006). There are essentially three ways which agents could be acquired by terrorist: they could be stolen, created in laboratory environments, or collected naturally. A gloomy reality is that as the advancement of new technologies reduce the costs of genetic sequencing, it will become easier and less expensive to create novel organisms (Garrett, 2012). Bioterrorist attacks can be planned to induce maximum damage and panic with a minimum risk of early detection. Potential agents of attack are categorized by risk (rated as an, A, B, or a C) depending on the agent's availability, ease of dissemination and transmission, and potential impact (Bioterrorism, 2006). Category A agents are considered the most dangerous and threatening to National Security. Ebola is categorized as a Category A bioagent because of its ability to cause mass panic and disruption and the special public health actions required for treating those infected.

Through the EVD, "mother nature has created the perfect bioweapon" (Thiessen, 2014). Following the Paris terrorist attacks, the French have warned that terrorist organizations may attempt to steal biological agents (Talent & Graham, 2016). The British Ministry of Defense feared terrorists would try to acquire EVD and released a report outlining three separate scenarios in which terror groups could successfully weaponize the virus. (Quinn, 2015) These could be stolen from research facilities, laboratories, or government stockpiles. While the more exotic and devastating agents (such as small pox) must be cultivated in laboratory environments and are therefore more difficult to obtain, many biological agents are naturally occurring (Gottron, 2002). Examples of these naturally occurring, and easier to obtain agents include: human immunodeficiency virus (HIV), the hepatitis strands, yellow fever, and the Ebola virus

(Gottron, 2002). Moreover, the Ebola virus is native to a continent where terrorist organizations like Boko Haram, Al-Qaeda, and the Islamic State are active (Thiessen, 2014). The 21-day incubation period allows potential jihadists more than enough time to infect themselves, then travel to infected population centers, developing the means of mass distribution (Thiessen, 2014).

In June 2001 – months prior to the September 11th attack in New York – Dark Winter, a senior level wargame, was run in conjunction with security think tanks and government agencies to simulate government responses to acts of bioterrorism (Dark Winter). The simulation demonstrated how a biological terror attack could result in mass civilian casualties, civil disorder, institutional breakdown and lack of faith in government – compromising national security (Dark Winter). Major challenges for policymakers included the many "fault lines" which existed between governmental agencies, the levels of government, private healthcare systems, and the public (Dark Winter). Breakdowns in centralized leadership and communication could threaten containment and control. It was revealed that the healthcare system in the United States had no surge abilities to prevent hospitals from becoming overwhelmed or to meet the heightened demand for vaccinations (Dark Winter). Finally, targeted communications and information management was recognized as a challenge, both in working with the media and in disseminating important information (Dark Winter). It became very clear after the exercise that the United States was unprepared for an act of bioterrorism. In 2010, nearly ten years after the Dark Winter exercise, a commission created to evaluate the national emergency response capabilities gave the nation a failing grade on its ability to respond to a bioterrorist threat (O'Grady, 2015).

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

The U.S. government has implemented a number of non-classified programs in an attempt to prevent biological attacks. Unfortunately, two of these programs, Project BioShield and the BioWatch Program, are woefully inadequate. Project BioShield was implemented in 2004 to encourage the development of countermeasures for chemical, biological, radiological, and nuclear attacks (Gottron, 2014). The funding allocated for Project BioShield has been reduced almost annually, especially during the recession years (Gottron, 2014). Congress is on track to have spent less than half of the funding dedicated to this crucial program (Talent & Graham, 2016). The program was successful at achieving some of its goals, such as acquiring countermeasures for identified threats like Anthrax and Smallpox; however, countermeasures have not been secured for more than two-thirds of the identified threats, including the plague, typhus, and of course, Ebola (Gottron, 2014). Only through prioritization – by both the executive and legislative branches – and a commitment to funding it accordingly, will Project BioShield adequately provide countermeasures (Biodefense, 2016).

The BioWatch Program was created as an early warning system to identify airborne biological weapons (Persons, 2015). The Department of Homeland Security has pushed for funding to develop a fully automated system capable of detecting biological agents within six hours, replacing the current manual system which can take more than a day to detect pathogens (Persons, 2015). After review by the Government Accountability Office, however, the current generation system was found to be inconsistent and inaccurate (Persons, 2015). One of the current programs relied on by the United States to detect the early stages of a biological attack has been determined to be ineffective. The Blue-Ribbon Study Panel on Biodefense has recommended that the Department of Homeland Security abandon the program, and look to replace BioWatch with a practical bio-detection program (Biodefense, 2016).

**Ebola as a case study**

What can be learned from the 2014 Ebola outbreak? Both socially and psychologically, the United States is unprepared for a major pandemic, whether it be introduced naturally or by malicious intent. The parallels between a naturally occurring pandemic and a bioterror attack are important, as similar challenges and operational shortcomings arise under both circumstances (O'Grady, 2015). The rapid spread and severity of the Ebola outbreak caused panic not just in the infected countries, but other countries worldwide (Salaam-Blyther, 2014). This is particularly relevant as the intention of biological attacks is not just to disrupt economic activity and create mass causalities, but to manufacture public hysteria (Langmuir & Andrews, 1952).

As Ebola was spreading in 2014, policymakers and health officials were forced to fight a war on two fronts. While they were attempting to map out and slow the infection spreading across western Africa, they were simultaneously confronting an "epidemic of fear" occurring domestically within the United States (Behman & Frieden, 2015). The media, and social media, contributed to a massive misunderstanding of the situation and the risk that Ebola presented (Behman & Frieden, 2015). This is consistent with the predictions of the Dark Winter exercise, the monumental challenge of maintaining effective communication by governmental agencies to disseminate factual and accurate information. The general public in the United States perceived Ebola to be a massive health risk, when in reality, not more than a few individuals were infected with the disease domestically. We can infer that based on the panic induced by a minimal amount of cases of the infection, if there was a substantial outbreak in a close proximity, how easily mass panic could impact could evolve into social unrest and economic breakdown (Gottlieb, 2014).

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

Terrorist organizations, as well as aspiring terrorists, have witnessed the overaction and panic caused by the presence of a few Ebola patients in the United States. This panic is demonstrated by something as basic as social media. When the Ebola crisis was at its peak in Liberia (on September 28, 2014) American's were tweeting about twelve times per minute about EVD. Two days later, after the admittance of the first infected person, Thomas Duncan, into the United States, twitter users were posting more than 6,000 times per minute about the virus. (Garrett, 2015). This panic is the result of a number of key factors: the dissemination of factually incorrect information, sensationalized reporting, the foreign origin of the virus, and the exotic sounding name - Ebola (Haelle, 2014). The true power of fear and misinformation became evident, such as when military units set for deployment into Somalia were cancelled out of fears they could spread the virus(Salaam-Blyther, 2014).

Partially in an attempt to quell public anxieties, and partially to prevent further proliferation of the disease, quarantine measures were implemented to prohibit the movement of people and products (Salaam-Blyther, 2014). Within some quarantine zones, mistrust of the government grew and violence resulted (Salaam-Blyther, 2014). A bioterrorist attack could result in further dilapidation of the central state and social control as the respective society is forced to deal with the protocols implemented following an attack.

Despite the fact that air travel presented minimal risk of spreading Ebola, flights were cancelled into infected countries (Salaam-Blyther, 2014). Prior to the outbreak, international flights to the United States were already required to report to the CDC passengers with certain illnesses and symptoms when advancing towards the United States (Cole, 2014). Nations implemented quarantine and border security protocols (Salaam-Blyther, 2014). This was largely done in efforts to prevent mass hysteria. Instead of a moratorium on international flights and port

of entry screenings, the CDC assured that exit based screening from infected nations would be a more effective and economic means of curtaining the spread of the virus (Wasem, 2014).

Within the United States, the health system has the authority following a biological attack to implement quarantine and isolation measures to prevent the spread of infectious disease (Cole, 2014). These are derived from Congressional authority under the commerce clause as well as the Public Health Service Act (Cole, 2014). The CDC asserted that mandatory quarantines were an ineffective measure to limit the spread of the Ebola virus (Salaam-Blyther, 2014). Still, many governments exercised quarantine measures, prohibiting the movement of people (Salaam-Blyther, 2014). These restrictions threatened regional economies, as well as inhibited the movement of goods across borders (Wasem, 2014). Should the United States experience a bioterrorist attack, this would not only put enormous economic strain on the nation to clean up and respond to the attack, but would also lead to quarantines which could cripple the domestic economy. It would be increasingly difficult to create a firm quarantine as a majority of American borders are porous land based borders (Wasem, 2014).

The Ebola crisis identified a lack of central command present in the United States when responding to biological incidents (O'Grady, 2015). Most of the administration's responses were decided in tandem between the Director of Center for Disease Control and the Homeland Security Advisor (Bradner, 2014). When the President did finally appoint a central command figure – Ron Klain – he appointed an experienced bureaucrat without a medical background who reported to both the President's National Security and Homeland Security Advisors (Tapper, 2014). This again, is a confirmation of the Dark Winter experiment – a lack of central command within the United States. Though the President eventually did appoint a central figure, it was late in the crisis and he was responsible for reporting two others.

**Conclusions**

The United States must continue to invest in efforts to prevent large scale pandemics. In many cases, the steps required to protect the population from a natural pandemic, are the same steps required to guard against bioterrorist attacks (Farmer, 2017). Policy makers cannot view these incidents, or their responses, as mutually exclusive. There is a continued need for better biological prevention and response. Congress can allocate more funding for - or at minimum continue the funding at the current levels of commitment - Project BioShield (Talent & Graham, 2016). This program was created to ensure the availability of CBRN countermeasures in the event of a terrorist attack. Without funding the program enough to develop and purchase the necessary countermeasures, they will not be available to the American people when needed.

At the time of the outbreak in 2014, there was no vaccination for Ebola (Thiessen, 2014). Experimental vaccination developed since that time have proven to be very promising but still remain in the trial phase (Berlinger, 2016). Imagine if countermeasures had been developed for Ebola as envisioned under Project BioShield? It is not impractical to think that these could have been used to diminish the fatalities caused by Ebola. The United States failed to respond to a small pox attack during the Dark Winter simulation, with stockpiled doses of a small pox vaccine available (Thiessen, 2014). Since most antibiotics and vaccinations are not profitable, there is little incentive to produce them in the open market (Talent & Graham, 2016). With additional funding, the perfected Zmapp drug could someday provide the much need cure for the Ebola virus, saving millions of lives and dollars in the long haul. The Ebola crisis demonstrated the global need to develop vaccinations immediately following the outbreak of an epidemic (Farmer, 2017).

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

The United States needs to invest in the development of modern vaccinations, antivirals, and antibiotics; especially ones capable and adaptable for neutralizing potential pandemics (Osterholm, 2017). Vaccination production for some viruses remains obsolete (Gupta, 2017), with it taking nearly a decade to develop, approve, and license a new vaccination (Farmer, 2017). With the aid of modern technology and developments in genomic sequencing, the promise of DBA vaccinations can lead to vaccinations which are more effective, and can be created more efficiently (Gupya, 2017). To effectively combat the spread of pandemics, vaccination production needs to be reduced to a matter of months (Farmer, 2017).

Congress must create additional grants to expand research in these fields and create other incentives to continue research into developing these important technologies deemed unfeasible. As former Director of the Central Intelligence Agency, John Brennan, has pointed out, the response to biothreats has lagged "behind the technology driving it" (Biodefense, 2016). Congress must consider reforming the drug-patent process, to incentivize research and development. The goal of this reform should be to "reward" pharmaceutical companies for developments in vaccines, antivirals, and antibiotics.

Vaccinations should be required of the general public. The CDC is deeply involved in a war of public opinion regarding the ethicalness, necessity, and legality of vaccinations. Congress needs to take a stance on the side of public health, and pass legislation to mandate vaccinations. Congress should allocate additional funding to the executive agencies to promote, encourage, and educate the public on the importance of vaccinations. At the end of the day, having an immunized population reduces the list of the potential biological agents which can be employed in a bioterrorism attack.

Reflecting Back on the Ebola Outbreak and the Future of Bioterrorism

Members of the United States armed forces, healthcare professionals, and first responders are trained to avoid infectious endemic diseases like Ebola (Jansen, 2014). The CDC provides an abundance of resources directed towards states, local governments, healthcare facilities, and emergency operators, which explain protocols in the event of both pandemics and biological attacks (Preparation, 2013). Resources also include information on identifying potential biological threats and the provision of emergency contact information for government offices such as the Department of Health, the Department of Homeland Security, and the Centers for Disease Control (Preparation, 2013).

While resources are made available to private citizens, they are not easily accessible. The federal government needs to make a stronger effort to "push" this information onto the public in the same way that information regarding earthquake preparation, storm preparation, and fire safety are pushed to the community. Pamphlets can be distributed teaching basic preparation, response, protection, and contact information. The more information the public has, the more prepared they will be should an attack occur.

The need to improve communication is once again a reminder that the United States needs to designate one agency -or person – as the authority during a biological incident (O'Grady, 2015). With the DOD, DHS, USAID, and the CDC (a division of the Department of Health and Human Services) are all involved in addressing the situation, there is a need for a final say. While the Obama administration did eventually appoint an Ebola czar, it would have been far too late had it been an act of terrorism infecting American's at home. It would be prudent to designate the line of command in the event of a bioterror attack. This could be achieved through an Executive Order, and it seems like the most pragmatic choice would to delegate control to the CDC.

Policymakers may view this as a double-edged sword and be reluctant to encourage the spread of this information through the public, fearing that it will instigate public panic. This information is already available to the public, however, albeit not readily available. If panic is to occur regardless then it is most pragmatic to ensure that panic is not occurring simultaneously with a crisis. An educated citizenry will be better prepared to assist and comply with the government.

Ebola showed the importance of global health security policy as the response to future pandemics will be increasingly dependent upon coordinated research and preventative health programs (Behman & Frieden, 2015). The United States needs to continue lending capital – both financial and human – to support public health efforts abroad (Salaam-Blyther, 2014). The Trump administration needs to reconsider budget proposals which cut funding to the National Institute of Health, the Department of State, and USAID; the agencies responsible for researching and combating epidemics abroad (Osterholm, 2017). By adopting a proactive approach, natural epidemics can be addressed long before they evolve into pandemics. This can be made possible through advanced research, but only if the agencies responsible have the tools and funding required.

Improving the capabilities of first responders abroad and improving the quality of healthcare facilities worldwide is absolutely essential for the security of the United States in this globalized world. Ebola was a strong example of the failures within the health system (Behman & Frieden, 2015). Far too many healthcare facilities do not meet the standards of modern medicine. Until these can be improved and modernized, people will remain at risk for contracting preventable diseases from the healthcare system (Behman & Frieden, 2015). Addressing these

looming failures will mitigate the spread of naturally occurring pandemics by allocating more resources to keep them from spiraling out of control.

As highlighted by the fragmented response to the Ebola crisis, the American public remains susceptible to mass panic. The federal government suffers from a lack of centralized response. Unfortunately, while events like the Ebola outbreak of 2014 or the Zika outbreak of 2016 demonstrate the need for improvements in public health, public education, inter-government communications, and biological research; it seems unlikely that these events alone will be enough to wake policy makers to the threats of biological agents. Moreover, the scarcity and perceived paltriness of previous bioterrorist attacks may have lured policymakers in to a false sense of security regarding the threat of bioterrorism. The case remains, the United States government and the America public are both unprepared to deal with large sale biological events; created through natural or intentional means. Until these shortcomings are addressed, the security of the United States is exposed.

## References

Allitt, P. A. (2015). *A Climate of Crisis: America in the Age of Environmentalism*. New York, NY: Penguin Press.

Behman, D. G., & Frieden, T. R. (2015, November 24). Lessons Learned After the Ebola Crisis: CTR Events. In Council on Foreign Relations. Retrieved February 1, 2017.

Berlinger, J. (2016, December 23). Ebola vaccine gives 100% protection, study finds. In CNN. Retrieved April 8, 2017.

Biodefense indicators: One year later, events outpacing efforts to defend the nation. (2016). Arlington, VA: Blue Ribbon Study Panel on Biodefense.

Bioterrorism overview (2006, February 26). In *Centers for Disease Control*. Retrieved January 17, 2017.

Bradner, E. (2014, October 17). Ebola czar 'may make sense,' President Obama says. In *CNN*. Retrieved January 10, 201.

Cole, J. P. (2014) Federal and State quarantine and isolation authority. (RL33201). Congressional Research Services.

Chiodo, M.D., E. P. (2015). *Bioterrorism*. Bloomington, IN: Xlibris US.Dark Winter: About the exercise (n.d.). In *John Hopkins Bloomberg School of Public Health: Center for Health Security*. Retrieved February 18, 2017.

Elmer-DeWitt, P. (2001, September 30). America's first bioterrorism attack. Time.

Farmer, B. (2017, February 18). Bioterrorism could kill more people than nuclear war, Bill Gates to warn world leaders. *The Telegraph*.

Fletcher, H. (2012, June 19). Aum Shinrikyo. In Council on Foreign Relations. Retrieved April 1, 2017.

Frieden, T. R. (2014, October 13). CDC director: Why I don’t support a travel ban to combat Ebola outbreak. In *Centers for Disease Control*. Retrieved January 2, 2017

Galvani, A. P., & Slatkin, M. (2003). Evaluating plague and smallpox as historical selective pressures for the CCR5-Δ32 HIV-resistance allele. In *Proceeding of the National Academy of Sciences* (Vol. 10). Washington D.C., DC: National Academy of Sciences.

Garrett, L. (2005). HIV and national security: Where are the links. *Council of Foreign Relations*.

Garrett, L. (2012, January). A public policy expert looks at the Bird Flu threat. *New York*

*Times*.

Garrett, L. (2015). Ebola's Lessons: How the WHO mishandled the crisis. *Foreign Affairs*.

Gottlieb, S. (2014, October 30). Why Ebola quarantines will grow larger -- and more troubling. *Forbes*.

Gottron, F. (2002). Synthetic Poliovirus: Bioterrorism and science policy implications. (RS21369). Congressional Research Services.

Gottron, F. (2014). The Projected Bio Shield Act: Issues for the 113th Congress. (R43607). Congressional Research Services.

Gupta, S. (2017, April 7). The big one is coming, and it's going to be a flu pandemic. In CNN. Retrieved April 8, 2017.

Haelle, T. (2014, October 21). The Hottest Zone: How the media stoked the U.S. Ebola panic. *Politico*.

Persons, T. M. (2015) Biosurveillance: DHS should not pursue BioWatch upgrades or enhancements until systems capabilities are established. (GAO-19-99) Government Accountability Office.

Jansen, D. J. (2014) Increased Department of Defense role in U.S. Ebola response. (IN10152). CRS Insights. Congressional Research Services.

Langmuir, A. D., & Andrews, J. M. (1952). Biological Warfare Defense. American Journal of Public Health.

Lister, S. A. (2014) Ebola: Basics about the disease. (R43750). Congressional Research Services.

Nordqvist, C. (2016). Pandemics: Past, Present and Future. Medical News Today. Retrieved January 29, 2017.

Obama, B. H. (2015). *The Administration's Response to Ebola*. In The White House. Retrieved January 19, 2017.

O'Grady, S. (2015, April 23). What did the U.S. learn from Ebola? How to prepare for bioterrorist attacks. *Foreign Policy.*

Osterholm, M. T., & Oshanker, M. (2017, March 24). The real threat to national security: Deadly disease. *The New York Times*.

Quinn, B. (2015, February 2). UK government feared terrorists would weaponise Ebola. *The Guardian*.

Preparation and Preparing for Bioterrorism Emergencies (2013, November 15). In *Centers for Disease Control*. Retrieved February 1, 2017

Ryan, J. R., & Glarum, J. F. (2008). *Biosecurity and Bioterrorism* (p. xii). Burlington, MA: Elsevier Publishers.

Salaam-Blyther, T. (2014) U.S. and international health responses to the Ebola outbreak in West Africa. (R43697). Congressional Research Services.

Selk, A. (2017, February 18). Bill Gates: Bioterrorism could kill more than nuclear war — but no one is ready to deal with it. *The Washington Post*.

Talent, J., & Graham, R. (2016). Time to act on threat of biological terrorism. St. Louis Post Dispatch.

Tapper, J. (2014, October 19). Obama will name Ron Klain as Ebola czar. In *CNN*. Retrieved January 10, 2017.

Taylor, A. (2014, October 1). Ebola panic in America might help save lives in Africa. *The Washington Post*.

Thiessen, M. A. (2014, October 20). A 'Dark Winter' of Ebola terrorism? *The Washington Post*.

Warrick, J. (2010, February 20). FBI investigation of 2001 anthrax attacks concluded; U.S. releases details. The Washington Post.

Wasem, R. E. (2014) Immigration policies and issues on health-related grounds for exclusion. (R40570). Congressional Research Services.