

COMMENTARY

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The COVID-19 Response Has Uncovered and Increased Our Vulnerability to Biological Warfare

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INTRODUCTION

Biological warfare has been an unlikely, but serious, concern for military operations and national security. The 2018 National Biodefense Strategy (NBS) articulated a collaborative plan to prevent, detect, and respond to biological threats to the USA.¹ The NBS highlights recent, isolated outbreaks of Systemic Acute Respiratory Syndrome (SARS), Ebola, and Zika viruses as warnings to nation states and justification for enhanced biological threat responses. Although these events are not considered deliberate threats, clandestine bioweapon programs and terrorist groups seeking such programs are known to exist and capitalize on such natural outbreaks.¹ The NBS's emphasis on prevention and response drives the requirement to enhance biological weapon deterrence and defense strategies to avert the employment of biological weapons on U.S. civilians or military personnel.¹

The public health crisis that ensued with SARS-associated coronavirus-2 (SARS-CoV-2) has highlighted our nation's bioweapon vulnerabilities on the international stage and has the potential for disastrous effects on national security. Previous questions regarding how the USA would respond to a large biological outbreak (or biological weapon) have now been answered for potential adversaries across the world. The ambiguity of both our capabilities and weaknesses, which provided deterrence to adversarial employment of biological weapons before the pandemic, no longer exists. This article will provide an overview on biological weapons and the concepts of deterrence and defense in the context of bioterrorism. Then, it will analyze how the national personal protective equipment (PPE) shortage, public resistance to public health measures, the anti-vaccination movement, and *USNS* (United States Navy Ship) *Comfort* deployment to New York City

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have increased our vulnerability to bioterror attack by impacting our deterrence and defense measures. Finally, it will offer recommendations to restore our bioterrorism security after the detrimental effects from the events unfolding in the USA.

BIOLOGICAL WEAPONS REGULATIONS, DETERRENCE, AND DEFENSE

Even though biological warfare is considered a “weapon of mass destruction” and is prohibited by a treaty drafted by the 1972 United Nations Biological Weapons Convention (BWC), not all adversaries adhere to these standards. Terrorist groups and covert operations have utilized biological weapons for small operations because the actors, by nature, are either non-eligible to ratify the treaty or would not do so if they could. Although there have been no intentional large-scale attacks, especially by adversarial nation states, this is not guaranteed to be the case in the future.²

The BWC does not prohibit ratified nations from having pathogens or toxins for peaceful purposes, such as the development of vaccines. After the natural outbreak of smallpox and its subsequent eradication accomplished by the World Health Organization in 1980, less virulent poxviruses have continued to be used in a variety of laboratories for research and development of vaccines for a variety of diseases.³ The original, more deadly strain of smallpox has been retained at two facilities in Russia and Atlanta.⁴ Because smallpox's virology makes it an ideal biological weapon, the samples in Atlanta and Russia offer defense through researching countermeasures should an attack occur and simultaneously provide a repository from which a biological weapon can be acquired.

“Deterrence” and “defense” are two concepts which are typically described in terms of nuclear warfare, but they can also be applied to national security from a biological attack.⁵ Deterrence is the ability to prevent an adversary from taking some action during peacetime.⁵ For biological warfare deterrence, vaccines and preventative medicine measures prevent susceptibility to a microbe. For a largely vaccinated and/or health-conscious population, the costs of production, storage, and dissemination of a bioweapon greatly outweighs the rare chance of the target contracting the disease. New Zealand's robust public health measures, citizen compliance,

and continued efforts to sustain a caseload under 20 since April is a strong deterrent for biological attack.⁶ Defense mechanisms decrease the effectiveness of the attack, putting a high cost-to-benefit burden on the adversary.⁵ A defense measure for bioterrorism would be an adequate medical treatment response to casualties of the bioweapon, decreasing mortality and the overall effectiveness of the weapon.

COVID-19 PANDEMIC ANALYSIS

The novel SARS-CoV-2 has several characteristics of an ideal biological weapon, including high transmission rate, long incubation period, airborne transmission, and significant morbidity/mortality.⁷ In fact, early in the pandemic, suspicion was cast that the virus was being developed as a biological weapon by a laboratory in Wuhan, China.⁸ Although these allegations have been deemed conspiracy theories as a result of misinformation operations, the resulting pandemic and the panicked public share similarities to a bioterror attack.

The events occurring within the USA during the coronavirus disease 2019 (COVID-19) pandemic create a global narrative on how we respond to a biological crisis. The 2018 NBS emphasized the continued threat of biological weapons to national security and identified the need to deter and defend against bioterrorism acts.¹ This section will analyze events in the USA during the pandemic, how they bolstered or negated our current bioterrorism deterrence or defense strategies, and offer areas for improvement to restore our bioterror security.

Personal Protective Equipment Shortage

The 2018 NBS mandates having a robust mobilization of PPE for frontline healthcare workers and an adequate communication plan on preventative health measures for the general public in the event of an attack.¹ The ability to provide sufficient quantities of PPE for medical personnel is a vital defense tactic as it increases the efficiency of the healthcare system to treat casualties in response to a biological outbreak. Having the ability to mobilize these resources to hospitals strengthens bioterror deterrence by demonstrating to a potential adversary that a bioterror attack would have a limited effect on a population given the healthcare preparedness.

As conflicting information was published across multiple media platforms from January to March, panic spread that the virus was more dangerous than originally believed. Citizens flooded stores in town and online, buying “essential items” in preparation for a lockdown. Items such as masks, gloves, and sanitizers were out of stock everywhere, including healthcare supply chains. More importantly, citizens heard N95 masks could prevent contracting the virus, suddenly increasing N95 demand.⁹ Demand exceeded supply quickly, and healthcare workers began complaining of the nation-wide shortage of appropriate PPE required to care for infected patients.¹⁰

The inability to acquire necessary PPE supplies due to crippled supply chains and general public hoarding caused a ripple effect within the healthcare system. As a result, hospitals began to institute resource conservation measures,

attempting to extend the life of supplies intended for one-time use. These PPE conservation measures, however, were interpreted by some healthcare workers as putting their lives in jeopardy and instigated lobbying and campaigning for government involvement. News reports flourished of disgruntled healthcare workers who were at risk of infection due to a lack of PPE.

Such reports of general public hoarding, inadequate PPE logistical chains, and inappropriate PPE conservation measures by hospitals demonstrate the USA's poor public health response. The NBS calls for an extensive mobilization of adequate PPE in response to a biological outbreak to decrease the pathogen spread, minimize its effects, and improve our resiliency.¹ The capability to decrease the pathogen's effects increases an attacker's “sunk costs” should they choose to release a biological weapon. An impaired, or presumably impaired, capability adversely affects our defense strategy. In addition, the decrease in cost-to-risk ratio impairs our deterrence measures by showing worsened biological denial. The rapid healthcare PPE disappearance secondary to pandemic panic demonstrated a critical vulnerability in one of the most important defense strategies for a bioterror attack.

To improve our defense capability, our healthcare workers must have an adequate supply of PPE, which can be mobilized expeditiously. Bioweapons have a high transmission rate and are easily disseminated, which make airborne and droplet transmission favorable. Public health experts should retrospectively analyze the types and amounts of PPE utilized in areas highly impacted by SARS-CoV-2. With these data, models can be created to make recommendations for phase-based mobilization of PPE and to determine the size of stockpile needed for immediate release. Government agencies need to establish agreements with PPE manufacturers to prioritize production in declared biological emergencies.

Anti-Vaccination Movements

Non-compliance with recommended public health and protective measures, including vaccines, also cripples our nation's biodefense. Public health measures such as social distancing, aggressive sanitation, and mask mandates are examples of defense tactics for the COVID-19 pandemic. The individualistic U.S. culture fueled widespread non-compliance with these measures and has had significant effect on our ability to “flatten the curve” compared to other countries.¹¹ The preference for “freedom... without interference from the state” is present in 58% of U.S. citizens, compared to 30-38% of European countries.¹¹ The USA's inability to uniformly employ these measures and decrease the virus spread compared to other countries signals to adversaries a weakness in our defense to decrease the effects of a biological outbreak.

Furthermore, the speculation and conspiracy theories surrounding COVID-19 vaccines suggest an inevitable resistance to receiving the vaccine when available. Resistance to vaccinations is nothing new and caused challenges for vaccination

against smallpox in the 19th-century U.K. epidemic.¹² Then in 2019, the U.S. measles outbreak was amplified by anti-vaxxer campaigns.¹³ Since early in the COVID-19 pandemic, social media posts have warned that future coronavirus vaccines contain either tracking devices for the U.S. government or toxic chemicals.^{13,14}

This unopposed and contagious anti-vax movement directly affects future biological deterrence because our adversaries know that the population will not be universally compliant with vaccination and will be susceptible to certain pathogens. Recent polls indicate that one-third of U.S. citizens,¹⁴ compared to 14% of U.K. citizens,¹² would avoid receiving a SARS-CoV-2 vaccine, even if available and affordable. A poor vaccination rate increases a population's disease susceptibility and decreases biological weapon deterrence by denial.

The anti-vaccination movement has caught traction from massive information operations and propaganda on multiple media platforms. Since May 2020, anti-vaxxers have been propagating lies about the side effects of the coronavirus vaccine, but as of June, the Centers for Disease Control, which is responsible for vaccine education, had only a "plan" to counter such anti-vaccine campaigns.¹⁴ When the first vaccines were being administered to healthcare workers in the USA in December 2020, multiple social media efforts were started to promote the vaccine.¹⁵ Hashtags such as #vaxup, #IGotTheShot, #vaccineswork, and many more were used with social media posts of doctors, nurses, and other medical personnel receiving their vaccine.¹⁶ Some posts continued with threads of updates on any side effects encountered to quell public concerns. Information operations such as these may be more effective to counter the anti-vaccination propaganda than government-sponsored campaigns and require further research by public health officials.

DoD Pandemic Response

From the beginning of the pandemic, the DoD has taken measures to decrease operational vulnerability and bolster pandemic response capabilities. Efforts such as developing COVID-19 evacuation teams and delivering medical supplies abroad demonstrate flexibility and innovation of the military system to respond to a complex medical problem.^{17,18} These efforts' successes increase the capacity to care for biological warfare victims and increase the relative gains compared to potential adversaries.⁵ In calculating cost-to-benefit ratio of an attack, differences in the ability to adequately treat and recover bioweapon patients create a relative loss between conflicting forces. The use of a biological weapon presents a risk to both sides of a conflict as containment of a bioweapon is difficult.¹⁹ The force with a more robust and effective medical system will have a lower casualty rate, can maintain operational capacity longer, and has better defense against a biological attack. If an adversary perceives a target to have a stronger medical defense capability, the adversary's potential

relative loss of casualties will increase the cost-to-benefit ratio, providing bioweapon deterrence.

The mobilization of U.S. Navy hospital ships, "USNS Mercy" and "USNS Comfort", intended to validate and exhibit the DoD medical defense but, from poor strategic messaging, may have inadvertently worsened our deterrence. The "USNS Comfort" was deployed to New York City on March 30, 2020, to assist with the COVID-19 surge by off-loading patients from the hospitals and creating more room for critical COVID-19 patients. Initial local media reports stated the ship would not be taking any patients with COVID-19 or several other diagnoses, which made transferring patients to the ship virtually impossible.²⁰ With the excessive expense of the Comfort's deployment to little benefit, New York hospital administrators and healthcare workers were infuriated. The ship's deployment came across as a pricy, empty gesture by the federal government in the midst of the critical PPE shortage. Pointed messaging toward the end of the ship's deployment, however, tried to respond to these negative messages and rectify public perception of the operation.²¹ Unfortunately, the underwhelming statistics had already worsened public distrust in the government and raised questions regarding the DoD's capacity to treat large numbers of bioweapon patients.

The DoD made large contributions to the COVID-19 pandemic response, including medical evacuation and international transport of PPE supplies. Unfortunately, the Comfort's deployment to New York City overshadowed other success stories and treatment advancements by the DoD medical system. The DoD must advertise the ability of the military to treat and evacuate COVID-19 patients without increasing exposure to medical personnel. This capability demonstrates the agility of our forces to respond to a challenge such as a bioterrorism casualty, suggesting such tactics would not have as profound an effect as desired by an adversary. Military medicine personnel involved with the DoD's COVID-19 response need to share success stories, lessons learned, and new procedure standards through medical conferences, scholarly articles, and public affairs platforms.

CONCLUSION

Although the 1975 Geneva Convention Treaty has admonished the use of biological weapons, the potential for bioterrorism remains a real one.² It is so real, that a 2018 NBS was created, nearly 40 years later, to establish proactive measures to counter the threat.¹ In 2020, the U.S. Biodefense Strategy was tested by SARS-CoV-2, and several weaknesses increasing our vulnerability and reducing our bioweapon deterrence were identified. Thanks to the 21st century's growing information age, our adversaries have seen our response. These signals to weakened biological deterrence and defense mechanisms will play into the adversary cost-to-benefit calculations of bioweapon employment. The interactions between the COVID-19 pandemic response and biodefense strategies can guide future endeavors dedicated to countering our

weaknesses and protecting our national security. Although military medicine is not solely responsible for upholding the NBS, it is a vital piece of the puzzle. Any implication to our adversaries that the USA is a weak target for biological warfare increases our troops' risk for such attacks from lack of deterrence. The flexibility and agility of the military health system during the COVID-19 pandemic is paramount to defend against a bioterrorism attack. However, in order to overcome the overarching detrimental effects to our bioterrorism defense and deterrence, we need to employ a robust information operations campaign, highlighting lessons learned and improved preparedness. Not only will such a campaign create deterrence by showcasing our bolstered defense strategies, but it will signal to adversaries the U.S. resilience to such psychological shocks.

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