

COMMENTARY

STRENGTHENING BIODEFENSE INTERNATIONALLY: ILLUSION AND REALITY

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WHILE THE U.S. HAS ARTICULATED a domestic vision for approaching biodefense in terms of national priorities and actions¹—including enhanced threat awareness, prevention strategies, surveillance and detection mechanisms, and response and mitigation capabilities—the U.S. needs to develop *and fund* a similarly comprehensive approach to strengthening biodefense internationally. Since my professional focus is on foreign policy, I am not in a position to comment on the effectiveness of the domestic implementation of the U.S. national biodefense strategy, but it is clear to me that there is a significant disconnect between the thoughtful approach to addressing the challenges domestically and the narrowly framed and inherently limited approach to addressing the same issues internationally as manifested in U.S. funding for international biodefense efforts. This divide between domestic and international approaches, however, signals a failure to recognize the unique and multisectoral nature of biological threats and a lack of imagination in addressing them. Policymakers in the U.S. and around the world need to recognize and understand that biological threats—whether occurring naturally or through deliberate bioterrorist attacks—do not respect borders; they are inherently global in nature. As such, the U.S. response must be equally international in nature.

There has been increasing attention to bioterrorism and biodefense ever since the anthrax attacks in the U.S. in 2001 brought these issues to the front pages. Along with this increasing concern has come recognition that bioter-

rorism is indeed an international issue requiring foreign policy solutions.² There are, however, 3 fundamental problems with the way the U.S.—and many other countries—are approaching biodefense internationally:

1. A failure to recognize the uniqueness of the biological threat and, instead, graft the model from nuclear nonproliferation inappropriately onto a biological realm;
2. A disconnect between domestic and international priorities and tactics; and
3. Neglecting the truly critical and effective components of strengthening biodefense internationally.

PROBLEM #1: FAILING TO RECOGNIZE THE UNIQUENESS OF THE BIO THREAT

The first major problem with the extant U.S. approach to biodefense internationally is an ongoing failure to recognize the uniqueness of the biological threat in our international funding priorities. Instead, international policies seem to derive from an ill-fitting attempt to graft the model from nuclear nonproliferation inappropriately onto a biological realm. This nuclear model is designed to limit access to nuclear materials, equipment, and expertise.³ The nuclear-derived model of biological nonproliferation, however, is conceptually flawed, contending that enhanced nonproliferation and security systems and practices (“guns, guards,

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and gates” at lab facilities are a primary tactic) are central to reducing the risk of bioterrorism.⁴ Such an approach, however, fails to recognize that biological materials are fundamentally different from nuclear materials in a variety of ways:

- Virtually all pathogens (with the exception of smallpox) are found naturally in the environment⁵—and at an almost limitless number of government, military, academic, and commercial facilities worldwide.^{6–8}
- It is not possible to track biological materials as one tracks fissile nuclear material.^{9,10}
- Bio-related equipment, expertise, and knowledge are widely available and broadly accessible.^{11–13}
- Scientific advances* make it ever more possible to create viruses and other organisms from scratch.¹⁴

Given all of this, biological nonproliferation efforts can provide only marginal protection at best—and should *not* represent the primary or even significant thrust of international efforts. The biological nonproliferation approach promotes merely an *illusion of security*—creating the false impression that such measures will meaningfully prevent or substantially reduce the risk of a bioterrorism attack.⁴ As Richard Danzig straightforwardly says, “Biological weapons will proliferate and we will be unable to retard this proliferation as effectively as we retarded nuclear proliferation over the past 60 years.”^{6(p65)}

Acronyms as Destiny?

A possible reason that international policy specialists continue to attempt to force an ill-fitting nuclear nonproliferation model onto a biological realm may well be lexical in nature. The use (and, as I’ve argued, overuse) of terms and acronyms such as weapons of mass destruction (WMD) and chemical-biological-radiological-nuclear (CBRN) may lead to a conflation of the threats and of the strategies to address them. Rather than recognizing the unique nature of biological materials and biological threats, such terminol-

ogy ends up conflating the issues—making it seem like dealing with bioterrorism is “merely another variant on a basic theme . . . as if these several forms only involve different formulations of the same fundamental weapon.”^{2(p134)} Promoting this generic “WMD” nonproliferation approach to strengthening biodefense ignores the ways in which “biological weapons are fundamentally different from other ‘Weapons of Mass Destruction,’”—particularly in the way they “differ greatly in their proliferation potential,” according to the National Academies of Science.⁹ The Institute of Medicine’s report goes on to state that “the WMD label fails to capture the disparate future trajectories of the technologies underlying biological, chemical, and nuclear weapons, so it will likely become ever more misleading over time.”^{9(p52)}

The prevailing experience and approach of most foreign ministries exacerbates the problems caused by this lexical sleight of hand, adding to the predominant emphasis on nonproliferation-based strategies in international engagement. Within most governments worldwide, it is the foreign ministry that often has primary or important responsibility for national policy promoting nuclear nonproliferation internationally; as such, it should not come as a surprise that, given their familiarity and decades of experience with nuclear nonproliferation, foreign ministries “default” to such nonproliferation-oriented approaches to bioterrorism and biodefense. In my work around the world, I have found that when envisioning a foreign policy response to bioterrorism, most foreign ministries turn first—and often only—to biological nonproliferation strategies when conceptualizing programming to combat bioterrorism. Rarely, if ever, do governments incorporate a truly multisectoral and comprehensive approach to addressing biological threats, involving equities and expertise from a broad range of sectors, including health, agriculture, law enforcement, intelligence, defense, transportation, trade, science, and development. Ultimately, however, this overreliance on bio nonproliferation as the solution to bioterrorism is reminiscent of the old joke about the man searching for his car keys under a streetlamp on a dark street. When asked where he lost his keys, he gestures toward his car halfway down the block, but says that he’s looking under the streetlamp “because the light is better here.”

Nonproliferation responses to bio are considerably simpler and easier to measure than creating and putting in place the kind of effective, multisectoral strategies that would truly help address bioterrorism and biological threats: improving global biosurveillance capabilities, creating early warning and detection systems to signal a biological outbreak, developing international communication and information-sharing mechanisms, initiating cross-border investigational approaches, establishing and

*Lest there be any confusion, let me state up front that these scientific advances and the ease of access to research and materials are fundamentally a very good thing. Biology and the life sciences contribute importantly and immeasurably to advancing medicine, agriculture, and public health globally. The free exchange of ideas, the broad spectrum of widely available expertise, and the ease of access to useful equipment (both basic and sophisticated) make advances in vaccine research, drug development, epidemiologic studies, and agricultural productivity ever more possible and prolific. Rather than looking at such materials and expertise as so-called “dual use,” it would be more accurate to identify them as “dual benefit” in acknowledgment of the socially beneficial role they play in a wide range of spheres.²

harmonizing standards internationally, creating and enhancing preparedness mechanisms, improving development of medical countermeasures and stockpiles, and building response and mitigation capabilities. As with the man looking under the streetlamp “where the light is better,” policymakers find it easier to concentrate on the measurable and seemingly more immediately tangible ideas of improving security for lab facilities, personnel screening, controls on materials and technology, and other bio nonproliferation tactics. It may be easier to identify labs without fences; determine which ones have locks on the freezers; put in place more guns, guards, and gates; and screen scientists for orders of equipment or materials. But this is ultimately of marginal utility and will do little to prepare for or respond to bioterrorism.

On the other hand, multisectoral strategies such as rapid disease detection, clear international communication and cooperation, and swift, successful treatment *will save lives* and thus function as a form of prevention or deterrent by making bioterrorism a less attractive option. International policymakers need to see that promoting extant and new public health and agriculture systems and, significantly, creating and strengthening detection and response capabilities is the central way to address bioterrorism. And this approach has the added value of simultaneously serving fundamental global health needs. Searching where the light is better may be seductive, but ultimately it is of limited value.

PROBLEM #2: DISCONNECT BETWEEN DOMESTIC AND INTERNATIONAL

The second major problem is a significant disconnect between the way the U.S. and other countries have approached domestic priorities and programs and the way they have approached international efforts. The U.S. biodefense strategy (NSPD-33/HSPD-10) articulates an approach to domestic biodefense in the U.S. that is thoughtful, multifaceted, and comprehensive, covering threat awareness, prevention and protection (including nonproliferation), surveillance and detection, and response and recovery. In other words, while there are debates about the ways in which U.S. biodefense priorities are being implemented domestically, it is fair to argue that the domestic approach is fundamentally balanced across a range of approaches and sectors.

U.S. funding and, consequently, actions for international efforts, however, are disproportionately focused exclusively or primarily on the nonproliferation component: attempting to prevent terrorist acquisition of pathogens, equipment, or expertise as the primary tactic to combat bioterrorism.

This overemphasis on approaches rooted in nonproliferation is particularly prominent in foreign policy funding and priorities—and this unfortunate overemphasis appears to be increasing. In FY2007, for example, the U.S. Department of State *expanded* its biological nonproliferation programs to work in more countries worldwide,¹⁵ and the U.S. Department of Defense registered expansion of similar types of activities.¹⁶ The State Department’s FY09 budget request goes even further and includes a “biosecurity bump up” for nonproliferation-focused activities “to improve pathogen security, facility biosecurity, and scientist engagement in South Asia, Southeast Asia, and the Middle East”^{17(p2)}—far beyond those countries of the former Soviet Union for which this Congressional funding was intended to stop the spread of materials from a country with offensive biological weapons capability. Similarly, the Defense Department has requested “an increase of more than 100% above the FY07 request for their biological proliferation prevention programs.”¹⁸

Illustrative of such an overemphasis, State Department officials describe pathogen security as a “prerequisite” for international cooperation.¹⁹ Similarly, others pushing the nonproliferation solution to the biological threat emphasize the “current lack of biosecurity” at lab facilities worldwide,²⁰ accompanying such presentations with photos of labs with unlocked freezers and arguing that “the result [of pathogen security nonproliferation efforts] is less of the stuff hanging around, a smaller risk of an accidental release, and a smaller risk of terrorists getting their hands on it.”^{21(p581)} And some are calling for even greater U.S. funding for international bio-related nonproliferation efforts.^{22,23} Similarly, a 2006 survey of key U.S. policymakers on the threat of biological weapons indicated that almost half believed bio nonproliferation should be the top policy priority.²⁴ Such declarations—coupled with the increasing funding—point to a set of foreign policy priorities with exaggerated and misdirected focus on bio nonproliferation as the primary strategy underpinning U.S. international efforts on biodefense.

I am not arguing that biological nonproliferation tactics are completely devoid of value, but rather that they are appreciably limited in what they can be expected to achieve. Thus, bio nonproliferation should represent a relatively small part of international efforts to strengthen biodefense and combat bioterrorism. Currently, however, the time, energy, and U.S. funding devoted to biological nonproliferation activities internationally far exceed their potential impact in actually addressing bioterrorism. And while bio nonproliferation approaches may stimulate or enhance global scientific engagement, there are, in most cases, more direct and effective ways to accomplish this engagement—without the concomitant costs associated with creating an *illusion of security* while in effect diverting

attention and resources away from fundamentally more effective and worthwhile strategies for international biodefense.

PROBLEM #3: NEGLECTING CRITICAL COMPONENTS OF EFFECTIVE BIODEFENSE INTERNATIONALLY

Rather than relying solely or primarily on nonproliferation-based approaches to biological threats, effective international strategies to combat bioterrorism and strengthen biodefense must instead emphasize those measures that will truly make a difference:

- Enhanced national biosurveillance and early warning systems;
- Greater cooperation among nations to detect outbreaks quickly, pursue epidemiologic (and possibly criminal) investigations, and communicate across borders;
- Collaborative international research on development and maintenance of medical countermeasures (vaccines and drugs);
- Development of mechanisms for efficient international distribution of medical countermeasures;
- Effective, swift treatment to reduce morbidity and mortality and to limit the spread of disease;
- Strengthened, cross-border preparedness and response mechanisms; and
- Successful approaches to mitigate the consequences of an attack, including shared or coalition-style approaches to handling attack repercussions.

Decision makers working on foreign policy and international relations must understand that for every dollar used for bio nonproliferation, there is substantially greater return in devoting comparable resources to strengthening international biosurveillance, detection, treatment, response, and recovery mechanisms worldwide. The choice need not and should not be a forced dichotomy; rather, international approaches must find the right mix of strategies instead of relying primarily or exclusively on the current policy and funding emphasis on bio nonproliferation as the global tactic that diverts attention and resources away from the other, more neglected areas needed for international biodefense.

Given the existing and requested increases in U.S. foreign policy and military programs promoting bio nonproliferation, one has to ask where are the corresponding sources of support and funding for the other components necessary for a multifaceted and comprehensive biodefense? Where are the support and funding for enhanced international biosurveillance, greater worldwide collaboration on threat awareness, and improved global systems for development and use of medical countermeasures?

RECOMMENDATIONS

Given these neglected areas, I have identified 4 key recommendations for foreign policy priorities in strengthening biodefense internationally:

1. Strengthen mechanisms to detect outbreaks and share information internationally.

This is of paramount importance—in addressing bioterrorism *and* naturally occurring disease. With the speed of international travel, diseases can move quickly around the world. As such, it is in U.S. interests—and in the interests of every nation—to have robust, effective, timely systems for identifying unusual disease patterns or emerging issues and then communicating that information appropriately to help limit disease spread. The World Health Organization's revised (2005) International Health Regulations (IHRs) are an important step in this direction, requiring WHO member states to maintain minimal disease surveillance and containment capacities and report public health emergencies of international concern.²⁵ There is a great deal to be done to make the IHR language a reality—and many nations worldwide need to do a great deal to strengthen weak, neglected, or virtually nonexistent public health systems if they are to meet the minimal core capacities described in the IHRs. In the interests of U.S. foreign policy, national security, and global security, the U.S. must put meaningful resources now into working globally to help nations and international organizations build robust, functioning systems to implement fully the IHRs. The U.S. Global Pathogen Surveillance Act—which would provide \$35 million to build disease surveillance and response capacity in developing countries, through training, communication systems, provision of public health laboratory equipment, and deploying U.S. health professionals²⁶—would be a small but good start in this direction. But despite being introduced in Congress many times over the past 6 years, the bill has never passed both the House and Senate.²⁷ If the U.S. is serious about strengthening biodefense internationally, it is time to pass this legislation and provide additional and sufficient resources to fully implement the IHRs globally and strengthen disease surveillance and early warning systems internationally.

2. Develop effective mechanisms to share medical countermeasures across borders.

Currently, almost all stockpiles of vaccines and drugs to address large-scale outbreaks or rapidly spreading diseases are held in national stockpiles and would presumably be for a nation's domestic use. But recognizing that diseases do not respect borders, nations must begin working together now

to create systems to share and distribute vaccines and drugs where they are most useful in slowing the spread of disease and limiting its impact. The creation of the Global Smallpox Vaccine Reserve at the World Health Organization is a start in the process of creating such mechanisms,²⁸ but there is still a great deal to be done to support that reserve and even more to be done to create reserves for a broader spectrum of countermeasures.

There are 2 examples from North America worth noting: the U.S. Department of Agriculture (USDA) has worked in collaboration with Canada and Mexico on a shared North American Foot-and-Mouth Disease Vaccine Bank, with Canada and Mexico as partners in the Bank;²⁹ and in 2007 the U.S., Canada, and Mexico, under the auspices of the Security and Prosperity Partnership (SPP), agreed to assist one another in public health emergencies, including the possible sharing of medical countermeasures among SPP nations.³⁰ These nascent efforts could perhaps serve as examples or effective models for international sharing of medical countermeasures for human, animal, and plant health.

3. Create mechanisms to stimulate enhanced international cooperation on R&D of new, improved medical countermeasures.

BioShield is a substantial U.S. investment in research and development for medical countermeasures. Other nations around the world are watching with interest to see what the U.S. accomplishes with this sizable expenditure. In the interests of helping create a truly global market for the products developed—and making limited national resources go further—the U.S. needs to put meaningful energy into building international partnerships for collaborative research, strengthening the reach of the science, helping limit redundancy of efforts, and establishing effective coalitions of shared expertise, discovery, and ultimately products.

4. Develop and implement more international exercises and training.

Preparedness and response are key to effective mechanisms for combating bioterrorism. While most nations implement exercises to simulate response to fictional crisis scenarios, more work needs to take place to *internationalize* such exercises. Fundamentally, all nations need to be coordinating their efforts. The U.S. and other nations must be working now to create, advocate for, and conduct regular transnational exercises and training programs to prevent, prepare for, contain, and respond to bioterrorism and biological threats.³¹ Exercises such as Atlantic Storm,^{32,33} with former senior officials playing the roles of senior policymakers in a transatlantic summit, and Black ICE (Bioterrorism International Coordination Exercise),³⁴ involving highest level offi-

cials from 12 international organizations, including WHO, Interpol, and NATO, are important steps in facilitating cross-border and interorganizational communication and cooperation. There is, however, much more to be done, including exercises that look at threat information sharing, early warning communication systems, joint investigations, and exploration of some of the differing international policies and technical standards on biodefense issues.

CONCLUSION

Most people recognize that issues of biodefense are fundamentally rooted in public health; many fail to recognize, however, that they are equally fundamentally rooted in foreign policy because of the nature of biology and disease. Therefore, foreign policy needs to be more prominent in addressing these inextricably linked sets of issues. While there is recent, growing recognition of the role of foreign policy in health and biodefense,^{35,36} this growing recognition fails to understand that effective detection, response, and recovery mechanisms represent the essential, multisectoral elements of a biodefense strategy—and are simultaneously central to any strategy to promote global health.

Fundamentally, deterrence of bioterrorism is much, much more than bio nonproliferation activities—and must from the outset encompass early detection, available countermeasures, adequate treatment, and effective remediation to be truly successful. Acknowledging this inherent synergy among biodefense, global health, and foreign policy—and the concomitant dual benefit that comes with it—is a vital step in securing U.S. and international policy support and funding for the truly effective and necessary elements needed to strengthen biodefense internationally.

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