

Contemplating the Threat of Biological Weapons Proliferation

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The proliferation of weapons of mass destruction (WMD) has become one of the most serious threats to human security. This danger will only increase should terrorists choose to acquire and use WMD. History shows that biological weapons, a major category of WMD, have been used to cause great harm. Soon after the terrorist attacks of September 11th and the anthrax attacks that followed, the potential proliferation of biological weapons attracted significant attention in the international community. More recently, the international community's concern about this problem has decreased because terrorists have not used biological weapons again, and nations have turned their focus instead to the nuclear crises in North Korea and Iran.

However, just because a new threat materializes does not mean that the old one disappeared, so the international community must ask itself, is there still a threat from biological weapons, and, if so, what measures can the international community take to deal with it? This essay will discuss the origins of and prospects for biological weapons proliferation from two perspectives, taking into account the characteristics of biological weapons that could facilitate proliferation and the political circumstances that could encourage or suppress it. The discussion will also include analysis of the problems and challenges that the international community faces with regard to stopping biological weapons proliferation.

The Characteristics and Proliferation of Biological Weapons

Biological weapons are composed of biological agents, the munitions the agents are put into, and the delivery systems for the munitions.² The type of biological agents employed gives the weapon its main characteristic. For example, a biological weapon could contain a disease that harms plants, animals, or people. Some diseases will only cause sickness; others can cause death. Also, the weapons could involve a human disease

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² Liu Huaqiu, ed., *Manual of the Control and Disarmament of Weapons* (Beijing: Publishing House of the National Defense Industry, 2000): 354. Bombs and spray tanks are examples of munitions, and biological weapons can be delivered by artillery, aircraft, or missiles.

Contemplating the Threat of Biological Weapons Nonproliferation

that is contagious (e.g., smallpox, plague) or one that does not spread from person to person (e.g., anthrax).

Compared with nuclear and chemical weapons, biological weapons boast a longer history. The earliest record of biological weapons can be traced to the 14th century. When Mongols besieged the port of Kafa on the Black Sea in 1346, they threw corpses infected with plague into the city, which caused the city's inhabitants to contract the disease and the troops defending the city to flee by ship. During the 1930s and 1940s, the Japanese Imperial Army engaged in biological warfare, killing more than 200,000 Chinese civilians and soldiers by dispersing typhoid, cholera, paratyphoid A, anthrax, and plague in over twenty provinces of China.³

The long history of biological weapons shows that it is easier to become truly proficient in making this type of weaponry than making nuclear or even chemical weapons. The advent of new technologies in microbiology makes it possible to manipulate diseases so that they are more lethal, more contagious, and therefore more effective as weapons. If one compares the characteristics of the three types of WMD, one finds that biological weapons have the “merits” of both chemical and nuclear weapons. For example, biological weapons can be a hundred, even a thousand times more lethal than chemical weapons. According to experts at the Monterey Institute of International Studies, “In many situations, [biological weapons] would also be more effective than nuclear weapons.”⁴ The U.S. Office of Technology Assessment determined that an aircraft spraying 100 kilograms of anthrax over Washington, D.C., on a clear, calm night could kill 1 to 3 million people, whereas the same aircraft spraying 1,000 kilograms of sarin would cause 3,000 to 8,000 casualties. In other words, a biological weapon would be vastly more effective than the chemical weapon.⁵

³ Another 10,000 were probably killed in laboratory experiments. Unit 731 of the Japanese Army, run by Dr. Shiro Ishii, was the centerpiece of Japan's biological weapons activities. For more, see Sheldon H. Harris, *Factories of Death: Japanese Biological Warfare, 1932-45 and the American Cover-up* (New York: Routledge, 2002).

⁴ Monterey Institute of International Studies, *Security and Arms Control in Northeast Asia*, Center for Nonproliferation Studies Programs, Course Materials, Lesson 5 (2005), 21. Available at: <http://cns.miis.edu/cns/projects/eanp/training/ttt/lessons/english/leo5.pdf>.

⁵ United States. Cong. Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, OTA-ISC-559 (Washington, D.C., U.S. Government Printing Office: August 1993): 54.

In comparison to nuclear weapons, biological weapons have several advantages.

Biological weapons are:

- Made with basic equipment and materials that can be readily obtained on the open market;
- Less costly than nuclear weapons;
- Easier to make than nuclear weapons (biological agents reproduce quickly in fermenters);
- Easily transported and hidden;
- Comprised of diseases that occur naturally, so the use of biological weapons can possibly be confused with a natural disease outbreak; and,
- Manufactured with dual-use materials and equipment that also have legitimate peaceful and commercial uses.

For these reasons, biological weapons have a reputation as the “poor man’s atomic bomb.” Governments and organizations (e.g., terrorist groups) that want to strengthen their military capability by acquiring WMD are more likely to choose biological weapons. This choice is especially true for governments and organizations that lack economic strength.

Some nations have always paid close attention to the threat of biological weapons proliferation. For example, the U.S. Department of Defense states: “Biological agent development is particularly troubling because virtually all the equipment, technology, and materials needed for biological warfare agent research and development and production are dual use. Thus, biological weapons applications are relatively easy to disguise within the larger body of legitimate commercial activity.”⁶ President George W. Bush’s administration has also emphasized that, “Unlike nuclear weapons, biological weapons do not require hard-to-acquire infrastructure or materials. This makes the challenge of controlling their spread even greater.”⁷

The European Union has also paid close attentions to the threat of biological weapons proliferation. A 2003 report from the European Union Council warned:

Although effective deployment of biological weapons requires specialized scientific knowledge including the acquisition of agents for effective dissemination, the potential for the misuse of the dual-use technology and knowledge is increasing as a result of rapid developments in the life

⁶ United States. Office of the Secretary of Defense. *Proliferation: Threat and Response*, (Washington, D.C.: U.S. Department of Defense, 2002): 4. Available at: <http://www.defenselink.mil>.

⁷ United States. The White House. *The National Security Strategy of the United States of America* (Washington, D.C.: March 2006): 21. Available at: <http://www.whitehouse.gov/nsc/nss/2006/>.

Contemplating the Threat of Biological Weapons Nonproliferation

sciences. Biological weapons are particularly difficult to defend against. Moreover, the consequence of the use may be difficult to contain depending on the agent used and whether humans, animals, or plants are the targets.⁸

As the century turned, concerns about the proliferation of biological weapons were clearly on the rise.

From a technical perspective, biological weapons are more likely to proliferate than nuclear or chemical weapons. The Monterey Institute for International Studies' experts claim that "Most developing nations would select an agent that is already well known so the technology of how to prepare it for weapons is not too complicated and is readily available. More than 100 countries already have plants to produce the agents required in biological warfare."⁹ If these countries want to make a biological agent, it is not that technically difficult to do so. Additionally, proliferators could profit from advances in biotechnology to develop qualitatively enhanced biological weapons and produce more biological agents. Monterey's experts underscore the proliferation potential inherent in the evolution of biotechnology: "In the past, only about 30 microorganisms or toxins have been considered for use as biological warfare agents. This number may increase in the future with advances in microbiology technology such as cloning and gene splicing."¹⁰

Several recent experiments, some involving diseases that could be used as warfare agents, demonstrate that the progress in biotechnology makes it easier to reproduce diseases, even from scratch. Over the course of three years, scientists at New York State University proved this principle by artificially creating the polio virus. They meticulously assembled key biological materials that they purchased from commercial warehouses. In 2003, another research group required only three weeks to assemble the

⁸ European Union. Council of the European Union. *Fight Against the Proliferation of Weapons of Mass Destruction: EU Strategy Against Proliferation of Weapons of Mass Destruction* (Brussels: 10 December 2003), 4. Available at: <http://ue.eu.int/uedocs/cmsUpload>.

⁹ The pharmaceutical and biotechnology industry has expanded considerably in the past decade, and industrial plants employ dual-use equipment. Monterey Institute of International Studies, *Security and Arms control in Northeast Asia*, Center for Nonproliferation Studies Programs, Course Materials, Lesson 5 (2005), 27. Available at: <http://cns.miis.edu/cns/projects/eamp/training/ttt/lessons/english/leo5.pdf>.

¹⁰ Monterey Institute of International Studies, *Security and Arms control in Northeast Asia*, Center for Nonproliferation Studies Programs, Course Materials, Lesson 5 (2005), 24. Available at: <http://cns.miis.edu/cns/projects/eamp/training/ttt/lessons/english/leo5.pdf>.

polio virus from separate segments of DNA.¹¹ One can very reasonably assume, then, that the developments taking place in the life sciences increase the potential for biological weapons proliferation. Continuing advances in biotechnology could provide for the development of biological weapons that are ever more lethal and make biological weapons easier to acquire.

History shows that progress in science and technology leads to the development of new, upgraded weapons. Consistent with that historical trend, a 2004 U.S. government report stated that “advances in biotechnology and the life sciences—including the spread of expertise to create modified or novel organisms—present the prospect of new toxins, live agents, and bioregulators,” and therefore that “preventing and controlling future biological weapons threats will be even more challenging.”¹² Ambassador Sha Zhukang expressed the Chinese government’s view on this issue, observing that given the “rapid development of biotechnology perhaps mankind faces a greater threat of biological weapons.”¹³

To offset the advantages discussed above, biological weapons also have some defects. One primary weakness of biological weapons is that their effectiveness is subject to meteorological conditions. Temperature, humidity, the presence of ultraviolet sunlight, and wind direction and speed can all degrade the potency of biological weapons. Additionally, chemical, biological, or nuclear weapons are primarily political tools. If WMD were used, the purpose would not be to kill enemy soldiers but to defeat the will of the enemy, to cause the public to panic. These types of political objectives cannot be effectively obtained with biological weapons because the country attacked could

¹¹ In the first experiment, the scientists combined the oligonucleotides of the polio virus, transcribed the complementary DNA into viral RNA using the RNA polymerase method, and then allowed the virus to replicate itself de novo in a cell-free extract. Jeromino Cello, Aniko V. Paul, Eckard Wimmer, “Chemical Synthesis of Poliovirus cDNA: Generation of Infectious Virus in the Absence of Natural Template,” *Science* 297, no. 5583 (9 August 2002): 1016-18. A second team of scientists, led by Craig Venter, required just two weeks to replicate the polio virus artificially. Smith, H. O., Hutchison, C. A., Pfannkoch, C. & Venter, J. C. “Generating a synthetic genome by whole genome assembly: PhiX174 bacteriophage from synthetic oligonucleotides,” *Proceedings of the National Academy of Sciences* (DOI: 10.1073/pnas.2237126100).

¹² United States. The White House. *Biodefense for the 21st Century* (Washington, D.C.: 28 April 2004): 1.

¹³ Ambassador Sha Zhukang, “Remarks of the Head of Chinese Delegation to The Fifth Review Conference of the BWC,” *Proceedings of The Fifth Conference of the BWC*, (Geneva: United Nations, 19 November 2001), 4. Available at: <http://www.china-un.ch/eng/gjhyfy/hy2001/t85217.html>.

Contemplating the Threat of Biological Weapons Nonproliferation

conclude that the disease outbreak occurred naturally, not from a deliberate attack. These factors could make biological weapons less attractive to proliferators.

With the twin crises of potential nuclear weapons development in North Korea and Iran in recent years, the international community has paid more attention to nuclear weapons proliferation than to biological weapons proliferation. The media reports frequently that nuclear weapons are more likely to proliferate than biological weapons, and the national security authorities of many countries are paying more attention to nuclear weapons than to biological weapons. Thus, if one were to assess the proliferation potential of biological weapons based on media reports and the statements of government officials, then the prospects for biological weapons proliferation are not so grave. However, that does not mean that the biological weapons threat is decreasing. On the contrary, the threat of WMD proliferation in general is increasing, and the threat of biological weapons proliferation is second only to the threat of nuclear weapons proliferation.

The Origins of Biological Weapons Proliferation

Although a major avenue for the proliferation potential of biological weapons resides in technology, as with the proliferation of all kinds of weapons, the ultimate cause of biological weapons proliferation is the international security environment. The current international security environment is such that many countries are forced to maintain their security by forging alliances with other nations or strengthening their military capabilities. Some countries do both. A country that decides to strengthen its military capabilities has an important choice to make when it comes to acquiring WMD. For a small or medium-sized country that perceives a threat to its security but has limited economic resources, biological weapons would be the best choice.

The international security environment has gotten significantly better since the end of the Cold War. This improvement manifests itself in two main ways. First, the end of the bipolar rivalry means that the great powers are inclined to cooperate, not to confront each other. Second, the demise of bipolarity situates the United Nations (UN) as the core mechanism of international order, increasing the UN's role in maintaining global

security. At the same time, many problems still afflict the international security environment, and these problems materialize in four ways.

First, anarchy remains the main feature of international society because the binding force of the UN and international law to govern and restrict the actions of sovereign states is only partial. The UN is not, after all, a world government; one of the central tenets of the UN is to maintain the sovereignty of states. Accordingly, the UN's regulations and resolutions have limited influence over the decisions and actions of nations. When a state breaks international law, the UN can lack the ability to enforce the law. However, if there is consensus among the great powers that a law has been violated, then the UN can maintain international security and justice. A case in point is Iraq's 1990 invasion of Kuwait, which was reversed when a military coalition under the auspices of UN Security Council Resolutions 660 and 687 forced the Iraqi military to withdraw from Kuwait. If there are differences among the great powers, then the UN can do little, as is the case with the Arab-Israeli conflict in the Middle East. Sometimes, a major power can publicly challenge the authority of the UN, such as when the North Atlantic Treaty Organization forces bombed Yugoslavia in 1999 and U.S. and British forces invaded Iraq in 2003. Absent a world government, nations still have to rely on their own resources to solve their security problems.

Second, many states continue to perceive threats to their security. At present, numerous countries, particularly the great powers, maintain their security by the traditional method of increasing their military strength. When the great powers lack confidence in their mutual strategic security, a resulting security dilemma stimulates them to develop their military capabilities further, including WMD capabilities. Although the United States has considerable military power, America continues developing its military capabilities while simultaneously articulating tough and even hostile policies toward some countries. As a result, some countries justify the development of their military capabilities in return.

Third, power politics and unilateralism still exist. Some great powers practice power politics. Such nations attend only to their own interests without considering the interests of other countries. In some cases, nations that employ power politics even do harm to other countries. Some countries view international society only through the

Contemplating the Threat of Biological Weapons Nonproliferation

prism of their own preferences, values, and ideology. They execute stringent policies towards some countries and in some instances they even try to pursue regime change in other countries. Such behavior can prompt minor or weak nations to enhance their military strength to protect their own security.

Fourth, the influence of nationalism is on the rise. The Cold War suppressed the differences of nationalities, but those differences are now becoming more prominent. Many regions of the globe are experiencing more tension because of increased nationalism. Some countries place too much emphasis on their own nationalism and interests, neglecting global interests and the interests of mankind as a whole. When such countries seek to increase their security and military strength, they do not hesitate to violate international law to develop WMD. At various times, several states are responsible for breaking the laws that prohibit the use, development, production, stockpiling, and transfer of chemical, biological, and nuclear weapons.

Aside from the inherent features of the international security environment, some countries have nonproliferation policies with obvious flaws that actually abet proliferation to a certain extent. U.S. nonproliferation policy is essentially a double standard because it calls on other countries not to develop weapons while at the same time the United States researches and develops new weapons, including strategic missile systems. The United States tolerates weapons development by its allies while harshly discouraging similar activity by its rivals. This type of policy can lead only to one result, and that is to stimulate rival countries to acquire WMD. The United States is not the only country to behave in this manner. Other countries, especially the great powers, have at times had weapons development programs that could potentially contradict their nonproliferation policies. However, as the world's lone superpower, the behavior of the United States most significantly influences other nations and therefore is more problematic.

In some respects, the international security environment also offers conditions favorable to the nonproliferation of biological weapons. The nature of warfare has changed in ways that limit the use of WMD. The main reason that some countries possess WMD is usually not to kill enemy soldiers during hostilities but to deter opposing countries from using WMD. Achieving deterrence with biological weapons is more

difficult than it is with nuclear weapons. To establish deterrence, a weapons program has to be out in the open, and historically, few governments have spoken publicly about their pursuit of biological weapons. Also, intelligence agencies have difficulty identifying covert biological weapons programs. A secret biological weapons program that is not at least seriously rumored presents no deterrent, unlike a nuclear weapons program that is publicly acknowledged or seriously suspected.

Some countries also try to realize domestic political objectives by acquiring WMDs, such as building national pride, enhancing national cohesion, and strengthening the authority of the government. As is the case with achieving deterrence, nuclear weapons are more likely to facilitate such domestic goals than biological weapons. Nations have been known to parade their nuclear weapons down the streets of their capitals, which is hardly the case with biological weaponry.

The tactics and weapons that terrorists have begun to employ recently complicate the biological weapons proliferation picture. The international community has always worried about the combination of terrorism and WMD, but that is particularly the case since September 11th. A pattern of activities indicates that terrorists are trying to obtain biological weapons, among other WMD. If terrorists can get their hands on WMD and use these weapons, the human loss could be a hundred or even a thousand times worse than on September 11th. The U.S. government concluded that “[t]here are few greater threats than a terrorist attack with WMD.”¹⁴ For its part, the Council of the European Union asserted that biological weapons “may have particular attractions for terrorists.”¹⁵ The prospects of terrorist acquisition of WMD constitute a new dimension of the proliferation problem. Terrorists will not seek to acquire WMD for purposes of deterrence. Rather, terrorists would want these weapons to kill as many people as possible so that they create panic in the country they target or the world at large. Any type of WMD—biological, nuclear, or chemical—would serve the objectives of terrorists.

In terms of the order of priority for WMD acquisition, some countries would seek nuclear weapons first and biological weapons second. Terrorists, however, would

¹⁴ United States. The White House. *The National Security Strategy of the United States of America* (Washington, D.C.: March 2006): 21. Available at: <http://www.whitehouse.gov/nsc/nss/2006/>.

¹⁵ European Union. Council of the European Union. *Fight Against the Proliferation of Weapons of Mass Destruction: EU Strategy Against Proliferation of Weapons of Mass Destruction* (Brussels: 10 December 2003, 4. Available at: <http://ue.eu.int/uedocs/cmsUpload>.

Contemplating the Threat of Biological Weapons Nonproliferation

possibly place first priority on obtaining biological weapons, simply because they are more easily obtained. Chinese scholar Liu Huaqiu has argued that “the possibility that biological weapons will be used is increasing, and the circumstances where these weapons can be used ranges from international war to civil war to terrorist attack. The means of using biological weapons is becoming easier and easier, and different warfare agents can be selected according to the target identified for attack.”¹⁶ Huaqiu refers to the potential to calibrate the amount of damage one seeks to inflict with biological weapons. Plant or animal crops can be targeted to damage a country’s economy, or the population of a city can be harmed by dispersing a non-contagious disease. An entire country can be targeted if a communicable disease is employed. Without the technical and financial assistance of a state, however, it is very difficult for terrorists to establish the capability to produce WMD. The most likely conduit for terrorists to acquire WMD is through the assistance of irresponsible countries. Most countries that behave irresponsibly are scarcely in possession of the considerable financial and technical resources needed to produce nuclear weapons, but biological weapons could be within their reach. Moreover, the international community has established stricter controls over nuclear weapons than it has for biological weapons. Whereas the Nuclear Nonproliferation Treaty requires international inspection of nuclear facilities to ensure that commercial and research reactors are not engaging in military activities, there are no monitoring provisions in place for the Biological and Toxin Weapons Convention.

As noted, some countries have the ability to make biological weapons because the equipment needed is easily purchased and the technical requirements of producing these weapons are relatively low. Just a handful of biologists can sometimes make biological weapons. The editors of the journal *Discover* argued that, “Although bioengineering probably lies well beyond the capabilities of a typical terrorist, one rogue biologist could wreak devastation.” To buttress their case, the *Discover* editors cited Gerald Epstein, senior fellow at the Center for Strategic and International Studies in Washington, D.C.,

¹⁶ Liu Huaqiu, ed. *Manual of the Control and Disarmament of Weapons* (Beijing: Publishing House of the National Defense Industry, 2000): 358.

on this matter: “I’m less worried about terrorists becoming biologists than biologists becoming terrorists.”¹⁷

The United States has paid special attention to the issue of bioterrorism since the anthrax attacks in the fall of 2001. On 12 June 2002, President Bush stated: “Bioterrorism is a real threat to our country. It’s a threat to every nation that loves freedom. Terrorist groups seek biological weapons; we know some rogue states already have them.”¹⁸ Reinforcing that point, a 2004 White House report observed that “[b]iological weapons in the possession of hostile states or terrorists pose unique and grave threats to the safety and security of the United States and our allies.”¹⁹ The Chinese government has also stated that “[n]owadays, the actual threat of bioterrorism is coming to us, so we should not avoid this issue.”²⁰ To punctuate international concerns about terrorism, the United Nations General Assembly requested the development of a comprehensive database on terrorist incidents involving biological materials, the convening of a meeting of the major biotechnology stakeholders (e.g., industry, scientists, governments) to agree on a common program to counter bioterrorism, and the updating of the UN’s roster of experts and technical procedures for the investigation of allegations of biological weapons use, among other initiatives to fight bioterrorism.²¹

Just as with the prospects for state-level proliferation of biological weapons, the threat of bioterrorism to some extent has its roots in the international security environment. Countries that possess biological weapons and make the decision to supply them to terrorists would do so mainly for political reasons. If such countries feel threatened by a great power or a rival state, they may diffuse the attention and resources of such state(s) by using terrorism to lessen the amount of pressure that the threatening state(s) place on them. Weaker countries might feel threatened when great powers

¹⁷ “The Future of Terrorism,” *Discover* 27, no. 7 (July 2006). Available at: <http://www.discover.com/issues/jul-06/cover>.

¹⁸ The United States. “President Signs Public Health Security and Bioterrorism Bill,” Remarks by the President at Signing of H.R. 3448, the Public Health Security and Bioterrorism Response Act of 2002 (Washington, D.C.: The White House, 12 June 2002).

¹⁹ United States. The White House. *Biodefense for the 21st Century* (Washington, D.C.: 28 April 2004): 1.

²⁰ Ambassador Sha Zhukang, “Remarks of the Head of Chinese Delegation to The Fifth Review Conference of the BWC,” Proceedings of The Fifth Conference of the BWC, (Geneva: United Nations, 19 November 2001), 4. Available at: <http://www.china-un.ch/eng/gjhyfy/hy2001/t85217.html>.

²¹ UN General Assembly, “The United Nations Global Counter-Terrorism Strategy,” Doc. A/60/L.62 (New York: 6 September 2006), 6-7. Available at: <http://www.un.org/terrorism/strategy>.

Contemplating the Threat of Biological Weapons Nonproliferation

engage in power politics, observe Cold War policies, or express a great power policy of regime change. Of course, it is also possible that governments influenced by extreme nationalism could decide to try to realize their political objectives by means of terrorism.

The way to resolve the problem of biological weapons proliferation, whether at the state or terrorist level, is to get to the root of the problem: namely, to improve the international security environment. The international community, especially the great powers, should abandon the old concept of security that depends mainly on increasing military strength to maintain national security and replace it with a new security framework. Accordingly, the authority of the UN and international law should be sustained and power politics and Cold War policies should be opposed. In dealing with countries that want to proliferate biological weapons and other kinds of WMD, a uniform, non-discriminatory approach should be observed. At the same time, the international community should take into consideration the security and developmental concerns of proliferating countries. In the fight against terrorism, the international community should collaborate to prevent some countries from pursuing their national interests under the guise of anti-terrorism. In order to prevent terrorists from getting these weapons, the international community's first step is to cooperate to improve the international nonproliferation system.

The Challenges Facing the International Nonproliferation System

Today, the roots of the problem of biological weapons proliferation have not yet been removed. The gravity of the biological weapons proliferation threat gives the international community an important opportunity to establish and improve the nonproliferation regime.

At present, the most significant component of the international biological weapons nonproliferation regime is the Biological and Toxin Weapons Convention (BWC), which was opened for signature on 10 April 1972 after receiving UN General Assembly approval and entered into force in 1975.²² Over 150 nations have signed the

²² This treaty's formal title is The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. As of 1 September 2006, 155 nations had joined the BWC, 16 nations had signed but not ratified the treaty, and 23 nations were non-signatories.

BWC and 140 have fully joined the treaty. The BWC consists of fifteen articles that are legally binding.²³ The treaty articulates tenets, principles, and objectives for the behavior of its members regarding the prohibition of biological weapons. Articles I and II state the main responsibilities for treaty members. Article I of the BWC obligates countries “never in any circumstances to develop, produce, stockpile or otherwise acquire or retain” biological agents or toxins in “types and in quantities that have no justification for prophylactic, protective or other peaceful purposes.” Article I also commits countries to forego biological weapons, equipment, and delivery systems, and in Article II, nations pledge not to transfer or assist any other country or entity to obtain biological weapons.

Although the BWC constitutes significant progress in establishing a biological weapons nonproliferation regime, the treaty has obvious defects. Chinese scholars have pointed out a shortcoming that even though the BWC does recognize the importance of the 1925 Geneva Protocol’s prohibition of the use of biological and bacteriological weapons in war, the BWC itself does not forbid the use of biological weapons.²⁴ The second defect in the BWC is that the treaty lacks concrete measures for effective monitoring and oversight. Also, the BWC does not specify sanctions or punishments for a violation of the treaty. The third weakness of the BWC is that the treaty has no binding force on nations that do not sign the treaty and proliferate biological weapons. Of the three flaws, the second is the most significant.

Since 1975, the members of the BWC have held five conferences to review the treaty’s operation and one special review conference. One of the most important objectives of these meetings has been for the international community to resolve the

For more information on the BWC and activities associated with it, go to: <http://www.opbw.org>.

²³ The prologue of the BWC reads: “The States Parties of this Convention, determined to act with a view to achieving effective progress towards general and complete disarmament, including the prohibition and elimination of all types of weapons of mass destruction, and convinced that the prohibition of the development, production and stockpiling of chemical and bacteriological (biological) weapons and their elimination, through effective measures, will facilitate the general and complete disarmament under strict and effective international control.”

²⁴ The second paragraph of the BWC’s prologue acknowledges the contribution that the 1925 Geneva Protocol’s prohibition on the use of poisonous gases and bacteriological warfare has made to “mitigating the horrors of war.” Article VIII of the BWC also stipulates that the nothing in the BWC should “in any way limit or detract” from a state’s obligations under the Geneva Protocol. Nonetheless, Chinese scholars have identified the failure to extend the BWC’s prohibitions to the use of biological weapons as a weakness. See Liu Huaqiu, ed., *Manual of the Control and Disarmament of Weapons* (Beijing: Publishing House of the National Defense Industry, 2000): 357; Xia Liping, *The Armament Control and Security in Asia-Pacific Region* (Shanghai: People’s Publishing House, 2002), 292.

Contemplating the Threat of Biological Weapons Nonproliferation

second defect mentioned above, the absence of monitoring provisions in the BWC. At the Third Review Conference in 1991, the BWC's members decided to establish a special group of experts to identify and evaluate the applicability of science, technologies, and other inspection methods to monitor the BWC. In 1994, the special conference discussed the twenty-one monitoring methods raised in the so-called VEREX report.²⁵ The momentum from the VEREX report propelled the BWC's members in 1996 to charter at the Fourth Review Conference an Ad Hoc group to negotiate the terms of a monitoring protocol for the BWC. The final report of the Fourth Review Conference called for negotiations to craft a monitoring protocol to be completed by 2001.²⁶

The Ad Hoc negotiating group did negotiate a draft BWC monitoring protocol and the final stages of negotiations were to occur in the summer of 2001, with the idea of having all BWC members approve the text at the Fifth Review Conference in November 2001. In May 2001, however, George W. Bush concluded an interagency review of the draft BWC protocol that found thirty-eight problems with the text. The U.S. government singled out five or six very serious problems and asserted they could not be fixed prior to the protocol's opening for signature.²⁷ The Fifth Review Conference convened in November 2001 in Geneva. When the U.S. representative insisted that the Review negotiations toward a BWC monitoring protocol be disbanded, many countries, including U.S. allies in Europe, voiced strong disapproval of the U.S. position. The Review Conference was not able to issue a final report at that time. Chinese scholar Xia Liping observed that the "Bush administration rejected the draft BWC protocol in order to protect the proprietary data of the U.S. pharmaceutical industry."²⁸ Indeed, U.S. officials listed safeguarding of sensitive commercial and national security data and the draft protocol's inability to monitor treaty compliance as their principal reasons for refusing to

²⁵ The United Nations. Ad Hoc Group of Governmental Experts to Identify and Examine Potential Verification Measures from a Scientific and Technical Standpoint, *Summary Report*, BWC/CONF.III/VEREX/8 (Geneva: 24 September 1993).

²⁶ The United Nations. Fourth Review Conference of the Parties to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, *Final Declaration*, Doc. BWC/CONF.IV/9 (Geneva: 1996).

²⁷ Michael R. Gordon and Judith Miller, "U.S. Germ Warfare Review Faults Plan on Enforcement," *New York Times*, 20 May 2001. The Bush administration formally refused to sign the BWC protocol in late July 2001. The United States. Don Mahley, "Statement by the United States to the Ad Hoc Group of Biological Weapons Convention States Parties" (Geneva: U.S. Department of State, 25 July 2001).

²⁸ Xia Liping, *The Armament Control and Security in Asia-Pacific Region* (Shanghai People's Publishing House, 2002): 295.

accept the draft agreement.²⁹ No matter what the reasons of the Bush administration may have been, the U.S. position was a unilateral one.

At a continuation of the Fifth Review Conference in November 2002, the international community decided to hold three annual technical meetings prior to the Sixth Review Conference at the end of 2006.³⁰ In other words, the international community has not stopped its efforts to strengthen the BWC. In fact, the Sixth Review Conference decided to continue these annual technical meetings until 2010.³¹

The U.S. policy on the problem of biological weapons nonproliferation is ambivalent. On one hand, the United States, with its counter-terrorism and nonproliferation policies, emphasizes that the proliferation of biological weapons should be prevented, especially with regard to terrorist acquisition of these weapons. On the other, the unilateral nature of the U.S. policy undermines efforts to strengthen the nonproliferation regime, which hinders the ability of the international community to cooperate on measures to prevent biological weapons proliferation. Thus, the Bush administration's unilateralist policy constitutes a major barrier to the strengthening of the international biological weapons nonproliferation regime.

Concluding Thoughts

Taking into account the status of developments in life sciences technology, the international security environment, and the nonproliferation regime, the potential for biological weapons proliferation is very high. From the technological perspective, the requirements for the equipment needed to make biological weapons and the costs of biological weapons are both low. In addition, it is difficult to distinguish when the equipment is being used for civilian or for military purposes, which means that biological

²⁹ The United States. Don Mahley, "Statement by the United States to the Ad Hoc Group of Biological Weapons Convention States Parties" (Geneva: U.S. Department of State, 25 July 2001); The United States. John R. Bolton, "Remarks to the 5th Biological Weapons Convention RevCon Meeting" (Geneva: U.S. Department of State, 19 November 2001).

³⁰ The United Nations. Fifth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, *Final Document*, BWC/CONF.V/17 (Geneva: 2002). Available at: <http://www.opbw.org>.

³¹ The United Nations. Sixth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, *Final Document*, BWC/CONF.VI/6 (Geneva: 8 December 2006). Available at: <http://www.opbw.org>.

Contemplating the Threat of Biological Weapons Nonproliferation

weapons can be easily hidden. The potential deadliness of biological weapons is higher than for most other types of weapons. When all of these factors are taken into consideration, biological weapons have the highest potential for proliferation of all WMD. As advances continue to occur in biotechnology and the life sciences, the potential for biological weapons to proliferate will become ever greater.

From the perspective of the international security environment, governments and terrorist groups must both be considered as possible proliferators of biological weapons. The contemporary environment for international security makes small and medium countries feel threatened by the great powers, which forces the smaller countries to try to master WMD to enhance their military strength. Because they are relatively cheap, biological weapons will naturally be among the choices that proliferators will consider.

One positive factor in this quandary is that modern practices of war and the contemporary international security environment limit use of biological weapons. The main objective for some countries in possessing WMD is to deter rivals and to prevent war, but biological weapons are far less effective as deterrents than nuclear weapons. Moreover, some countries try to reach some political objectives by acquiring WMD. In this respect, biological weapons are not as effective as nuclear weapons, which is one of the reasons that the international community pays more attention to nuclear weapons than to biological weapons.

The most likely proliferators of biological weapons will be terrorists. Biological terrorism will be one of the most significant threats to international security. The objective of many terrorists today is to kill as many people as possible. Therefore, they are actively trying to acquire biological weapons, which are easy to obtain and as lethal as nuclear weapons. The most likely route for terrorists to get biological weapons is from irresponsible countries that already have them.

Taking technology and international security into consideration, the motivation and conditions exist for the proliferation of biological weapons. The international community has to cooperate to strengthen and improve the nonproliferation system so that it can fulfill the purpose it is intended to serve, namely to prevent the proliferation of biological weapons. The BWC, which is the most significant tool in the international biological weapons nonproliferation system, contains some serious flaws. The most

important of those defects is that the BWC continues to lack mechanisms for monitoring and verification. The international community has done a great deal to lay the foundation to establish monitoring and verification for this treaty, but the policies of the Bush administration did not permit adaptation of the proposed BWC monitoring protocol. Thus, the international biological weapons nonproliferation regime continues to be faced with severe challenges.

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