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Title: Perspectives on the Biological Weapons Convention

Abstract:

While the secretary-general of the United Nations has questioned whether the COVID-19 pandemic has exposed a gap in global defenses against bioterrorism that a nefarious group may seek to exploit, the reality is that the pandemic has only underscored the folly of biological warfare, a strategy which relies on weapons—viruses, bacteria, and other pathogens—that would indiscriminately wreak havoc on the attacked and the attacker alike. Indeed, most countries in the world are part of the Biological Weapons Convention, the international treaty that—while lacking an enforcement mechanism—has successfully bolstered the near universal norms against the use of biological weapons.

Keywords: Biological Weapons Convention; Biological Weapons; Biological Weapons Threats; Biological Weapons Norms; Biological Weapons Programs; Terrorism; Biological Warfare

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In 1960 Matthew Meselson, a newly-minted assistant professor of Biochemistry and Molecular Biology at Harvard University, spent the summer at the Arms Control and Disarmament Agency in Washington, DC, a US government funded independent organization that worked on non-proliferation issues (Klotz and Sylvester 2009). Paul Doty, a long-time advisor to the government on nuclear-weapons disarmament and Meselson's departmental colleague at Harvard, had recommended Meselson spend time at the agency.

While at the agency, Meselson decided to pay a visit to nearby Fort Detrick, Maryland, to see what the United States was doing, where he had a flash of insight. At the building that housed

the giant fermenters used for anthrax production. Meselson asked, "Why do we do this?" His guide on the tour, Leroy Fothergill, replied, "It's a lot cheaper than nuclear weapons."

And the light went on in Meselson's head.

"Don't we want to make war so expensive no one can afford it but us?" he asked. Why would the United States want to pioneer a way to make war so cheap that virtually anyone could unleash a deadly attack? His intuition was that this was a dumb thing to do, especially when the United States already had megaton nuclear weapons.

Several years later, a chance encounter at Boston's Logan International Airport sparked a new chain of events. Meselson almost collided with former colleague Henry Kissinger, an advisor to President Richard Nixon. "What shall we do about your thing?" Kissinger asked. Kissinger knew well of Meselson's struggle against bioweapons development, and he would bring the scientist's reports to Nixon, who became convinced by Meselson's argument. Nixon ended the United States' biological weapons program in November 1969.

This set the stage for the United States to begin pushing for an international treaty dealing with the threat of biological weapons. The chief negotiator for the United States for what would become the Biological Weapons Convention, Ambassador James Leonard, became one key figure shepherding its adoption in 1975. British officials working on non-proliferation believed that both a treaty about chemical and biological weapons were needed, but the two should be separated, and the biological weapons should be first. The United States agreed, and given its influence on the world stage, international arms control negotiators tackled biological weapons first.

Since the Biological Weapons Convention went into effect, the norm against biological weapons use has become nearly universally accepted; only 10 countries are outside the convention, while 183 nations to date have signed or acceded to it (UNOG 2020a). As a diplomatic forum for discussion of biological weapons disarmament and arms control, the convention plays an invaluable role. It also provides the underlying foundation for regimes such as the Australia Group, a collection of countries that has agreed to harmonize certain export regulations in order to prevent the proliferation of biological weapons-related technologies and know-how.

Although the convention only bans the development, production, and stockpiling of biological agents (including toxins) for purposes and in quantities that have no justification for peaceful purposes as well as the development and possession of weapons systems for dissemination of biological agents (UNOG 2020a) it does not outlaw the wartime use of biological weapons; that's banned in the Geneva Protocol of 1925. (Mikulak 2017).

Is the Biological Weapons Convention toothless?

Negotiations over the convention were happening against the backdrop of the Cold War and US government officials at the time believed it was unlikely that the Soviet Union would accept any kind of on-site verification for chemical or biological weapons. As Leonard, the US negotiator on the convention, observed, the Biological Weapons Convention was indeed a "gentleman's agreement."

The lack of enforcement provisions was certainly noticed, especially after the Chemical Weapons Convention (UNODA 2020.)*, adopted in 1997, had mechanisms for verifying*

compliance. The chemical weapons convention has two main provisions to accomplish this: on-site challenge inspection[s]to resolve questions about noncompliance and visits to randomly selected sites. The latter of these inspection types were to be voluntary visits.

The adoption of the Chemical Weapons Convention encouraged diplomats to undertake the long process of negotiating enforcement provisions for the Biological Weapons Convention. A United Nations ad hoc group was formed, which developed a so-called protocol (UNOG 2001) to the Biological Weapons Convention that contained verification provisions (Klotz 2019).

Although early drafts of the proposed protocol used the word verification, it became clear to the ad hoc group that "verification" was not the right word, and the use of it was meeting heavy resistance from those who know that while verification is almost always possible for nuclear weapons development or testing, it would be much more difficult of a concept to apply to dual-use biological science endeavors.

Indeed, the true value of the on-site investigations and visits in the proposed protocol is transparency. For instance, for a military organization lack of transparency could cause another nation to suspect that the military is developing biological weapons, and the second nation could then act in kind by developing biological weapons itself. Thus, transparency is the true goal of the protocol.

The final protocol draft does not mention the word verification even once but uses the word transparency dozens of times

But the ad hoc group had finished its negotiations when George W. Bush was elected president in 2000. He appointed John Bolton as Under Secretary for Arms Control and International Security, who immediately pulled the United States from the negotiations and threatened supporting nations in order to get them to abandon the protocol. When President Barack Obama was elected in 2008, there was hope that the protocol could finally be enacted. That hope was quashed when Obama also decided not to support the protocol.

Compliance with the Biological Weapons Convention is instead left to individual nations to monitor, through their own means, any suspicious activities by other member states. Despite the difficulties of embedding a verification mechanism within the convention, bilateral and multilateral diplomatic attempts to address noncompliance have been reasonably effective, although a handful of compliance issues remain (State Department 2020).

The abandoned protocol had two provisions to provide enforcement for the Biological Weapons Convention through on-site activities., The convention would no longer be a gentleman's agreement. Under the proposal, countries would be able to request an investigation to determine the facts about alleged noncompliance on the part of another country. There would also be randomly selected site visits.

In light of the political failure to adopt compliance mechanisms, it's worth asking whether compliance is a necessary function of the convention. Clearly, at the outset, the framers of the convention wrestled with this question, and found that the adoption of the treaty as a rule setting, normative proscription against biological weapons had value, even without enforcement tools.

Alleged noncompliance of the convention by member states has taken place. The Soviet Union maintained a biological weapons program that existed at least until 1992 and a South African program called Project Coast targeted figures opposed to the apartheid regime as well forces in neighboring Namibia. In both cases of non-compliance, the suspect activities were addressed diplomatically, outside any Biological Weapons Convention mechanism.

Far from irrelevant, the convention provides a useful forum for the international community to discuss a wide range of topics related to biological weapons, and recent convention meetings have included active participation by non-governmental organizations. Provisions of the convention call on member states to "consult bilaterally and multilaterally to solve any problems with the implementation (UNOG 2020b)," and member states have used diplomatic efforts to respond to biological weapons-related developments (Sims 2001). One off-shoot that demonstrates the broader impact of the convention and the norms against biological weapons it creates is the Australia Group, a forum of mostly industrialized, western countries that seeks to harmonize national export controls to ensure that exports do not contribute to the development of chemical or biological weapons. These efforts are in support of national obligations under the convention (The Australia Group 2020).

The question of utility.

Arguably, almost all countries accept the convention and its underling norms because of the widespread belief that biological weapons have no military utility. It's easy to renounce a weapon category that has no practical value. Moreover, public renunciation of biological weapons can earn a country political good will. There are few historical examples of biological weapons use. The birth of the convention came at a time when nuclear weapons had supplanted biological weapons in the weapons of mass destruction arsenals of the major world powers. The perception that biological weapons lost military utility in the nuclear era paved the way for negotiations aimed at disarmament and the birth of the convention (Tucker and Mahan 2009). The rationale behind most countries' pursuit of biological weapons was for retaliation in kind against an adversary's use—the advent of nuclear weapons eventually led most countries to decide to abandon biological weapons for retaliation.

In researcher Seth Carus's examination of the history of biological weapons programs, he found 15 countries from 1915 to 2015 that had known programs, four that probably had them, and four more that possibly had them (Carus 2017a). Carus assessed that few of the known programs operated for very long, most only for a few years. Most were small and fairly unsophisticated. Carus wrote that it is likely only eight operated at any one time. Since the end of World War II, only three nations (Israel, Rhodesia, and South Africa) have likely used biological weapons, and in those cases they were employed in assassinations and small-scale operations by intelligence services and special forces (Carus 2017b). As Carus noted, however, information on most programs is sparse, and in some cases from a single source (Carus 2017a). Given the tenuous nature of analyzing programs, information on how leaders think about the utility of biological weapons is nearly non-existent. In a couple of cases, however, we have some indications of policy debates. These cases include the British and US programs. In both examples, the countries abandoned their respective offensive programs after examining their utility.

The limited utility of biological weapons appears to have effectively constrained most nations from pursuing then, and almost all of the countries which once had active offensive programs have abandoned those efforts. The few known cases since World War II of countries using biological weapons mostly have involved small-scale operations in support of internal regime security, whether through assassinations of dissidents, regime rivals, or in counterinsurgency

operations. The historical record reinforces the idea that the weapons possess no military utility. The scenarios that most threaten the norms against using biological weapons are internal regime security operations and assassinations.

Noncompliance.

Since the Biological Weapons Convention entered into force in 1975, there have been very few member states that have violated or are suspected of not complying with its terms. The US State Department produces an annual noncompliance report and the most recent one singled out just four countries for compliance concerns: China, Iran, North Korea, and Russia. Only one, North Korea, is assessed as having an offensive weapons program (State Department 2020). This list has been consistent over the past six years.

But in two notable cases—the Soviet Union and South Africa—parties to the convention did violate its provisions. And in both situations, the noncompliance was addressed diplomatically, outside the structure of the convention, possibly due to the highly sensitive nature of the intelligence underlying the concerns. Resorting to the convention's mechanisms to address these issues would have meant sharing sensitive intelligence with an unacceptably large audience.

Beginning in 1989, after Soviet biological weapons researcher Vladimir Pasechnik defected to the United Kingdom, western intelligence services began gaining new insights into the Soviet offensive biological weapons program (Kelly 2002; Leitenberg and Zilinskas 2012). On 14 May 1990, the United States and Britain outlined their concerns about the Soviet program to Moscow (Leitenberg and Zilinskas 2012). The demarche led to high-level discussions, and President George H.W. Bush later met with Soviet leader Mikhail Gorbachev at Camp David in June 1990. Diplomatic pressure by the United States and Britain eventually resulted in a trilateral agreement for mutual visits to facilities in each country and in President Boris Yeltsin's April 1992 renunciation of his country's program and renewed commitment to adhere to the Biological Weapons Convention.

In the South African case, the country ratified the convention in 1975 and apparently had little interest in pursuing biological weapons. From the outset, influential South African defense researchers concluded that the weapons possessed no military utility. They pointed out that the sub-Saharan climate was not conducive to the biological agents--strong sunlight in the region would render most biological weapons pathogens ineffective. In 1970, Jean de Villiers, head of South Africa's Council for Scientific and Industrial Research's Applied Chemistry Unit, wrote "In a South African context the long periods of dry weather and strong sunlight generally experienced would greatly decrease the effectivity of this method of distribution (aerosol) (de Villiers 1971)." In a July 1977 report, de Villiers wrote that "[T]he real application of biological warfare is so problematic that, except in severely limited and clandestine situations, biological warfare under any circumstances is highly unlikely…Therefore it can be said that biological warfare poses no threat and is also of no advantage to South Africa (de Villiers n.d; de Villiers 1971)."

But as the domestic security situation in South Africa began to change, the regime began to look to more effective means to counter violent unrest following the Soweto uprising in 1976. In 1981, South Africa began its biological weapons program, codenamed Project Coast. Project Coast's objective was to develop chemical and biological weapons "to ensure maximum disruption of the enemies of the state (Gould and Folb 2002)." This goal was accomplished by providing biological weapons agents to covert special forced units for use in assassinations, although in at least one case, a community was targeted. Assassinations

targeted not only members of the African National Congress, but also included members of the security forces seen as possibly compromising the security of South African operations. Project Coast also developed biological agents for use against South West Africa People's Organization (SWAPO) guerrillas fighting against South Africa in neighboring Namibia.

Project Coast effectively ended in 1993, prior to US and UK officials pressing the country on the suspected weapons efforts as well as on the activities of Project Coast head Wouter Basson. The diplomatic pressure resulted in US and UK officials interviewing major players in Project Coast and visiting facilities tied to the covert project. It also led newly elected South African President Nelson Mandela's government to admit the existence of the South African program in documents submitted to the Biological Weapons Convention (Burgess and Purkitt 2001).

Could the life science revolution erode the norm against biological weapons use?

The emergence of dual-use capabilities in the life sciences are unlikely to erode biological weapon norms. Discussion about the biological weapons threat from either state or non-state actors often revolves around emerging technological capabilities, including the rapid pace of advances in the life sciences, bioinformatics, and the convergence of these advances with developments in artificial intelligence, additive manufacturing, and robotics. Some of those changes relate not only to the astounding pace at which the underlying science and technology is developing, but also to the rapid global diffusion of the knowledge, material, and equipment that lies at the core of the life sciences enterprise and the changing socio-political environment across the globe.

No doubt, emerging technologies provide almost unimaginable new capabilities to manipulate biological systems, and these capabilities are proliferating globally as well as becoming more and more accessible to less skilled users. Commentators focus on these emerging capabilities because they are identifiable, observable, and to some degree measurable.

But robust biosafety and biosecurity programs at most western academic and commercial research institutions reinforce the norm against misuse of biological materials, technology, or know-how. Biosafety and biosecurity protocols also are in place at community biolaboratories. Other efforts, such as the annual International Genetically Engineered Machine competition introduce high school and undergraduates to biosecurity concepts. On the whole, the stigma and dread attached to biological weapons remains pervasive and constraining. Indeed, the example of the 2001 anthrax letter attacks by a mentally ill scientist in a US government biodefense laboratory seems to have been an aberration and of limited relevance now in assessing the current threat.

Possession of a capability is not indicative of noncompliance to the Biological Weapons Convention given that capabilities are inherently dual-use and increasingly ubiquitous. Studies of well-documented historical biological weapon efforts provide insight into calculations of the utility of biological weapons and how revolutionary changes in capabilities affect the normative prohibitions against them.

The biological weapons threat.

The biological weapons threat is hard to accurately assess; even most intelligence services find difficulty in grappling with this challenge. Often commentators point to the past and claim that the pursuit of biological weapons in the 20th Century indicates that a threat exists now. This argument fails to recognize that many national programs were abandoned in the era of nuclear weapons. Some writers point to the progress in the life sciences and assert that the new technologies and capabilities make threats more plausible (NAS 2006; Frinking et al. 2016). This line of analysis fails to take intent and utility into account.

The biological weapons threat from state actors, with the exception of perhaps North Korea, seems to have lessened considerably since the height of the Cold War (Sweijs, Kooroshy, and Kooroshy 2010) and now appears limited to assassinations. Russia allegedly used radioactive polonium to assassinate one of its former agents Alexander Litvinenko in 2006 and similarly is accused of using a nerve agent, novichok, in an attempted assassination of Yuri and Yulia Skripal in 2018. While these substances aren't biological weapons agents, it is reasonable to assume that Russian intelligence services likely have explored their use in assassinations, and may be prepared to use them in the future (BBC 2020).

Although the North Koreans have used chemical agents in assassinations, notably VX nerve agent in the murder of Kim Jong-un's elder brother in 2017, North Korea likely would use biological weapons in a conflict with South Korea to offset the military superiority of both the South Korean and US armed forces (State Department 2019). However, apart from the use of biological weapons in assassinations, use by nation-states—with the possible exception of North Korea—is not likely given that biological weapons have no practical military utility in a force-on-force conflict.

The terrorist use of biological weapons lays outside the convention's mandate, but it remains the chief threat. Assessing the threat from non-state actors is more problematic given the number and diverse goals of many these groups. International terrorist groups, including Al Qaeda (Pita and Gunaratna 2009) and ISIS, are believed to have explored development of biological weapons, but available open-source information on current, ongoing terrorist interest is sparse. The potential for use of biological agents in "biocrimes" (Carus 2001) remains significant. But these also fall outside the convention, being by definition criminal acts most often perpetrated against spouses, neighbors, and work supervisors, as well as police and court officials. Although not infrequent, biocrimes almost certainly have little-to-no effect on the health of biological weapons norms.

The COVID-19 pandemic highlights that disease agents have little utility, and should serve to reinforce the norms against using biological weapons. COVID-19 is proven uncontrollable and indiscriminate, both features that negate the utility of such weapons. The experiences of the pandemic should give any nation pursuing biological weapons pause--time to consider the consequences of an uncontrolled disease spreading to their own population. Yet some in influential quarters are warning that COVID-19 instead could incentivize terrorist use of indiscriminate pathogens. The UN Secretary-General, António Guterres, remarked to the Security Council in April that "The weaknesses and lack of preparedness exposed by this pandemic provide a window onto how a bioterrorist attack might unfold – and may increase its risks. Non-state groups could gain access to virulent strains that could pose similar devastation to societies around the globe (Guterres 2020)." However, far more likely is that rational actors, including terrorist groups, would be dissuaded from biological weapons

activities by the example of COVID-19. Even terrorist groups likely would conclude from that use of contagious biological agents is folly. Intentional spread of any indiscriminate disease such as COVID-19 almost certainly have catastrophic consequences for communities supporting terrorist as it would for their adversaries. Apocalyptic groups, such as Aum Shinrikyo—the Japanese group responsible for a sarin gas attack on Tokyo's subway system in March 1995--are possibly the only exception. These groups seek catastrophic societal and governmental collapse to advance their own agendas or beliefs and may not be dissuaded from the deliberate release of highly lethal, highly contagious pathogens.

Largely for political reasons, the Biological Weapons Convention doesn't have a mechanism to verify compliance. But almost every country has signed onto the treaty and known cases of noncompliance are few and far between. The world has the convention to thank for the nearly universal norm against using biological weapons. Indeed, the convention has fostered an international community of diplomats and others who've successfully addressed some of the few concerns that have surfaced. That's far from toothless.

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