The Biological Weapons Convention: Challenges and Opportunities

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June 2024

GCSP Policy Brief No.15

GCSP
Geneva Centre for Security Policy

Geneva Centre for Security Policy

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ISBN: 978-2-88947-428-8

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Acknowledgments

I would like to thank Dr James Revill and Ms María Garzón Maceda for their valuable comments and helpful feedback.

Introduction

Amid geopolitical challenges that have led to the weakening of international arms control and disarmament efforts, the Ninth Biological Weapons Convention (BWC) Review Conference (RevCon) provided a "glimmer of hope"[1] for control and disarmament regimes. Delegates at the Non-Proliferation Treaty RevCon in 2022 and the Chemical Weapons Convention RevCon in 2023 were unable to reach a consensus on these conferences' respective final documents. By contrast, the Ninth BWC RevCon held from 28 November to 16 December 2022 successfully adopted the final document.[2] While conflicting positions on how to reflect recent allegations that some states are undertaking biological-weapons-related research prevented agreement on the article-by-article review, the final document included a forward-looking section that established a Working Group on the Strengthening of the BWC.[3]

This Working Group is designed to "strengthen the effectiveness and to improve the implementation of the Convention" and generate recommendations for enhancing and institutionalising it across a number of important areas, including confidence-building measures (CBMs), transparency, compliance and verification, and the national implementation of the BWC.[4] The Working Group's sessions, therefore, provide a long-awaited opportunity to address several critical issues related to the Convention, including international cooperation and a verification mechanism.[5] The Working Group also presents a valuable opportunity to advance work on national implementation under Article IV and interlink obligations.

[1] UN Meetings Coverage and Press Releases, "Secretary-General Welcomes Outcome Document for Biological Weapons Convention's Ninth Review Conference, Saying It 'Offers a Glimmer of Hope'", 16 December 2022, https://press.un.org/en/2022/sgsm21638.doc.htm.

[2] Ninth RevCon (Ninth 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.IX/9 (2022), 22 December 2022, https://documents-dds-ny.un.org/doc/UNDOC/GEN/G22/617/94/PDF/G2261794.pdf?OpenElement.

[3] L. Bencini et al., *Reflections on Review Conferences: The Non-Proliferation Treaty, the Biological Weapons Convention and the Chemical Weapons Convention*, Geneva, UNIDIR, 2023, pp.13-14.

[4] Ninth RevCon, 2022, pp.9-10.

[5] First Working Group session was held on 15-16 March 2023, second session on 7-18 August, and third session on 4-8 December.

The recent convening of the Working Group from 4 to 8 December 2023[6] and the subsequent meeting of states parties from 11 to 13 December[7] offer pertinent insights into progress made in strengthening the BWC. Ahead of the next session of the Working Group scheduled for August 2024, this Policy Brief seeks to outline some of the security challenges presented by biological weapons and lay out some of the policy implications and recommendations that flow from these challenges.

Security challenges

Over the course of the 20th century, several states had extensive biological weapons programmes that were established to develop a range of biological weapons, including strategic biological weapons intended to cause mass destruction and weapons designed for a number of other usages.[8] In the current environment, several states have made allegations related to biological weapons programmes, and concerns are growing over the potential for non-state actors to exploit advances in science and technology. The BWC and the wider regime lack any means to verify such allegations, and it is difficult to objectively determine the existence and extent of current offensive programmes.

It is also clear that non-state actors have explored the development of biological weapons: the Japanese doomsday cult Aum Shinrikyo (the Supreme Truth), which went undetected by security services for years, provides a well-known example of a clandestine biological weapons programme, including the use of anthrax by a terrorist group. Although the cult succeeded in murdering 13 people and injuring around 5,800[9] during the infamous Tokyo subway attack using a nerve agent (sarin), its use of anthrax in Kameido, Tokyo, resulted in no fatalities. As was the case with the sarin attack, the anthrax was not properly "weaponised" because the group, among other things, chose the wrong strain to use. The internal dynamics and competition over resources between the heads of Aum Shinrikyo's biological and chemical programmes also seem to have contributed to the poor performance of these weapons.[10]

[6] See UNODA (United Nations Office for Disarmament Affairs), "Biological Weapons Convention – Working Group on the Strengthening of the Convention", 20 March 2023, https://meetings.unoda.org/bwc-/biological-weapons-convention-working-group-on-the-strengthening-of-the-convention-third-session-2023.

[7] See UNODA, "Biological Weapons Convention – Meeting of States Parties", 20 March 2023, https://meetings.unoda.org/bwc-msp/biological-weapons-convention-meeting-of-states-parties-2023.

[8] See M. Wheelis et al., *Deadly Cultures: Biological Weapons Since 1945*, Cambridge, Mass., Harvard University Press, 2006.

[9] R.C. Gupta, *Handbook of Toxicology of Chemical Warfare Agents*, London, Academic Press, 2015, pp.27-35.

[10] J.P. Zanders, "Internal Dynamics of a Terrorist Entity Acquiring Biological and Chemical Weapons: Insights for the Study of Possible Nuclear Weapon Acquisition", in B. Volders and T. Sauer (eds), *Nuclear Terrorism: Countering the Threat*, London, Routledge, p.42.

Although Aum Shinrikyo may not have been able to achieve a functional biological weapon, the biological weapons threat remains and is arguably increasing as science and technology are advancing, converging, and diffusing around the globe. This process empowers more scientists to manipulate biology and develop biotechnological solutions to societal issues. However, it also potentially makes biological weapons more powerful and more accessible than in the past. Moreover, this trend is occurring at a point where geopolitical tension is mounting, and while advances in science are overwhelmingly applied for peaceful purposes, we cannot discount a darker biological weapons future. This is particularly of concern because of the range of uses biological weapons could serve in today's conflicts, including mass killings, but also assassination; sabotage; and small-scale, deniable, localised attacks against a particular population group designed to kill, incapacitate, demoralise, or degrade such a segment of the population.

Policy implications

Changes in science and security have generated a number of policy implications for the biological weapons regime. This section will look at the implications in relation to defining biological weapons, national implementation of the BWC, verification and transparency, and CBMs, including the use of open-source intelligence.

Defining biological weapons

The BWC under Article I(1) defines biological weapons as "microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes", and also includes delivery systems under Article I(2). Definitions offered by weapons control specialists may differ from the legal interpretation, however. Such ambiguities in definitions, while providing the constructive ambiguity required for treaty agreement, can sometimes impede measures to strengthen the agreement, causing uncertainty during deliberations and disagreements on key elements contained in operative paragraphs. International treaties and agreements such as the BWC are, above all, legal instruments. From a legal perspective, precise definitions agreed upon at appropriate forums help to clarify the object and purpose of such an instrument.

In addition, as indicated above, biotechnology is a dual-use technology and, while it is overwhelmingly applied for peaceful purposes, can also be applied for harmful ones. This duality of the technology is evident from the legal meaning contained in such a definition. The wording "no justification" denotes intent. In criminal law, establishing or, better still, proving criminal intent, or what lawyers call *mens rea* or "guilty mind", denoting an intent to commit a crime, is rather challenging without the accompanying *actus reus*, meaning actual

conduct, such as searching the deep web for deadly pathogens or toxins, i.e. concrete weaponisation steps. Although challenging, establishing such intent is important for both preventing life-threatening illegal activity with dangerous pathogens and implementing the BWC at the national level.

National implementation of the BWC

National implementation is required under Article IV of the BWC, under which states parties shall "take any necessary measures to prohibit and prevent the development, production, and stockpiling of the agents, toxins, equipment, and means of delivery that could be used to produce a biological weapon".[11] This means criminalising conduct specified by the Convention by using black-letter law,[12] particularly the development, production, stockpiling, acquisition, retention, or transfer of these toxins, equipment, etc.

The Convention does not explicitly prohibit the use of biological weapons in any of its operative paragraphs. Nevertheless, such a prohibition is included in its second last preambular paragraph: "Determined, for the sake of all mankind, to exclude completely the possibility of bacteriological (biological) agents and toxins being used as weapons" and further implicitly through references to the 1925 Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare. Additionally, in the Final Document of the Eighth RevCon, states parties expressed an understanding concerning Article I "that the use by States Parties, in any way and under any circumstances of microbial or other biological agents or toxins, that is not consistent with prophylactic, protective or other peaceful purposes, is effectively a violation of Article I".[13] As such, there is an obligation stemming from these instruments and customary law to prohibit such use.

In addition, the Convention obliges states parties to both prohibit *and* prevent such use. Efforts to prevent the development and use of biological weapons have encompassed a range of legal and non-binding measures, i.e. regulatory or soft law measures. This includes guidance on biosafety and biosecurity and wider governance measures such as codes of conduct and educational materials designed to inform scientists of their legal and normative responsibilities as part of a wider set of measures designed to implement and enforce the BWC.

United Nations (UN) bodies, particularly the BWC Implementation Support Unit (ISU), play an important role in helping states parties to enhance their national biosafety and biosecurity capabilities by providing guiding documents, tools, expertise, and technical support. Moreover, the ISU has made noteworthy

[11] See full text of the Convention at UNODA, Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, n.d., https://front.un-arm.org/wp-content/uploads/2020/12/BWC-text-English-1.pdf.

[12] In common law legal systems, black-letter law refers to well-established legal rules that are not subject to reasonable dispute.

[13] Final Document of the Eighth RevCon, BWC/CONF.VIII/4, 2017, p.10, https://documents.un.org/doc/undoc/gen/g17/004/32/pdf/g1700432.pdf?token=UkEMejYjGDQGlAFvpC&fe=true.

efforts in creating the *UN Guide on Implementing the BWC*[14] and supporting the national implementation of the BWC through a series of outreach initiatives. These include workshops, seminars, tabletop exercises, and legislative and CBMs assistance.[15] The ISU also administers the BWC Sponsorship Programme to allow developing states to send their representatives to official BWC meetings in Geneva.[16]

Other international organisations, such as the World Health Organization (WHO), are also playing an additional supportive role in BWC implementation, e.g. through the Global Guidance Framework for the Responsible Use of Life Sciences[17] and subsequent work of the WHO Technical Advisory Group on the Responsible Use of the Life Sciences and Dual-Use Research.[18]

In addition, scientists and related organisations play a role in supporting the BWC. To provide one example, two universities in China and the United States collaborated to develop the Tianjin guidelines,[19] which aim to establish guiding principles and a framework for aspirational codes to foster biosecurity at the national and institutional levels, akin to the Hague Ethical Guidelines developed by the Organisation for the Prohibition of Chemical Weapons (OPCW).[20] Therefore, understanding these varied approaches by states parties to the BWC can help inform discussion in the Working Group around national implementation.

Verification

In 1991, at the Third BWC RevCon, member states parties agreed to establish an ad hoc group of verification experts known as VEREX to identify potential verification measures from the scientific and technical standpoints.[21] VEREX reported back in 1993 after identifying and evaluating 21 measures that could,

[14] UNODA, *Guide to Implementing the Biological Weapons Convention*, 21 December 2023, https://disarmament.unoda.org/guide-to-implementing-the-biological-weapons-convention/.

[15] See https://disarmament.unoda.org/biological-weapons/implementation-support-unit/relevant-activities-overseen-by-the-isu.

[16] UNODA, "BWC Sponsorship Programme – UNODA", 15 May 2024, https://disarmament.unoda.org/biological-weapons/assistance-and-cooperation/bwc-sponsorship-programme.

[17] WHO (World Health Organization), *Global Guidance Framework for the Responsible Use of Life Sciences: Mitigating Biorisks and Governing Dual-Use Research*, 14 May 2022, https://iris.who.int/bitstream/handle/10665/362313/9789240056107-eng.pdf?sequence=1.

[18] WHO, "Technical Advisory Group on the Responsible Use of the Life Sciences and Dual-Use Research (TAG-RULS DUR)", November 2023, https://www.who.int/groups/technical-advisory-group-on-the-responsible-use-of-the-life-sciences-and-dual-use-research-(tag-ruls-dur).

[19] InterAcademy Partnership, "The Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists", 20 December 2021, https://www.interacademies.org/sites/default/files/2021-07/Tianjin-Biosecurity-Guidelines-Codes-Conduct.pdf.

[20] OPCW (Organisation for the Prohibition of Chemical Weapons), "The Hague Ethical Guidelines", 19 December 2015, https://www.opcw.org/hague-ethical-guidelines.

[21] J. Revill et al., *Back to the Future for Verification in the Biological Disarmament Regime?*, Geneva, UNIDIR, 2022, p.3, https://unidir.org/wp-content/uploads/2023/05/UNIDIR_Back_to_Future_Verification_Biological_Disarmament_Regime.pdf.

in combination, potentially build confidence in compliance with the BWC.[22] Following the work of VEREX, the BWC depository states (Russian Federation, United Kingdom and United States) convened a Special Conference of States Parties to establish a further ad hoc group tasked with negotiating a legally binding protocol, part of which focused on verification.[23] Despite several years of negotiations among states over the course of the late 1990s and early 2000s, the protocol did not come to fruition and was rejected in 2001 largely due to US objections.[24]

Since the identification and evaluation of verification measures by VEREX in the early 1990s,[25] the international community has developed significantly more advanced technologies for verification, ranging from highly sophisticated satellites to bio forensics or open-source intelligence.[26] Many of these tools and technologies could be brought to bear in contributing to a verification regime for the BWC. As much was recognised in the BWC Working Group meeting in December 2023, which discussed verification in the BWC forum for the first time in more than 20 years and generated a constructive discussion.

At the same time, challenges remain around the objectives, conceptualisation scope and definition of verification. Without greater conceptual clarity, it will be difficult to make progress on verification, particularly in today's geostrategic context. Moreover, for all the advances in technology, procedures will be needed for any verification systems to ensure that any multilateral regime is a process "collectively agreed upon by all BWC States Parties to ensure international legitimacy and acceptability to all".[27] Any such regime will also need to be "designed around explicit obligations of the BWC" and provide a balance between intrusiveness and considerations for legitimate security and commercial interests.[28]

Achieving such a balance will be difficult and entails determining intent – specifically, whether states are developing, producing, stockpiling, or otherwise acquiring or retaining "microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes". This is particularly problematic in the BWC, in which, unlike other treaties, the application of material accountancy measures is limited by the fact that working

[22] Ibid.

[23] Ibid.

[24] Ibid., p.4.

[25] UNODA, *Summary of the Work of the Ad Hoc Group for the Period 24 May to 4 June 1993*, 21 December 1993, https://docs-library.unoda.org/Biological_Weapons_Convention_-_Ad_Hoc_Group_on_VEREX_Third_session_(1993)/BWC_CONF.III_VEREX_06.pdf.

[26] J. Revill, *Verifying the BWC: A Primer*, UNIDIR, 2023, p.9, https://unidir.org/wp-content/uploads/2023/10/UNIDIR_Verifying_BWC_Primer.pdf.

[27] Ibid., p.5.

[28] Ibid.

with micro-organisms often involves their rapid multiplication, in some cases overnight. In this regard, it becomes strikingly evident that addressing the inappropriate utilisation of these pathogens necessitates a comprehensive approach encompassing legal, security, intelligence and preventative strategies.

Building transparency

In the absence of a verification mechanism, the BWC has established a system of politically binding CBMs designed "to prevent or reduce the occurrence of ambiguities, doubts, and suspicions, and in order to improve international cooperation in the field of peaceful biological activities".[29] In their current form they comprise six forms covering, inter alia, national biological defence research and development, outbreaks of infectious diseases, and past activities in offensive and/or defensive biological research. While a valuable source of information on the activities of some states parties, completion rates remain low, and "47 States Parties have never submitted a CBM report and several States Parties participate irregularly".[30] Indeed, just over 50% of states parties "have exchanged CBMs in the last few years".[31] There are further challenges with the quality and consistency of CBM information; as the ISU has indicated, the CBM summary form is "sometimes incomplete, unclear or does not corroborate with information in the attached CBM forms".[32] Although CBMs are the primary agreed source of transparency in the BWC, it is notable that several other tools could also provide greater transparency regarding the activities of a state or facility. Particularly important here is open-source intelligence (OSINT).

OSINT is often a misunderstood field, even among government professionals. OSINT is a "product made by gathering, evaluating, and analyzing information collected from publicly available sources such as journals, websites, magazines, public records, libraries, or social media. Contrary to popular belief, they come not only from online sources".[33] In addition, OSINT does not always necessarily mean lawful conduct. Without proper caution, these legal boundaries may be easily crossed. Moreover, the utilisation of OSINT techniques lacks effectiveness unless accompanied by thorough evaluation and implementation of suitable analytical methodologies. An analogy provides additional clarity to this complex yet significant interconnection:

[29] UNOG (United Nations Office at Geneva), *Biological Weapons Convention, Final Document of the Second Review Conference*, BWC/CONF.II/13/II, Geneva, UNOG, 1986, p.6, https://docs-library.unoda.org/Biological_Weapons_Convention_-_Second_Review_Conference_(1986)/BWC_CONF.II_13.pdf.

[30] D. Feakes, "Confidence-Building Measures under the Biological Weapons Convention: Information Briefing by the BWC ISU", Third Session of the Working Group on the Strengthening of the Convention, 4-8 December 2023.

[31] Ibid.

[32] Ibid.

[33] Interview with Skip Schiphorst, an OSINT course developer and instructor with i-Intelligence GmbH who served for 17 years in the Dutch Ministry of Defence, 16 December 2023.

> in order to make an excellent dish, it's best to first separate the good ingredients and spices from the bad ones before mixing them together in order to subsequently cook them using the right pots and pans while all along applying the right techniques and temperatures.[34]

OSINT extends beyond basic internet browsing and requires proper analysis. Open-source tools can function as a new means of generating transparency, could potentially play an important role in verifying the BWC, and improve the capability to identify and monitor potential biological hazards.[35] They can provide an additional piece to the puzzle; however, integrating them into a multilateral regime also requires agreed-upon processes and procedures, which presents yet another challenge, and a disparity exists between what may be achieved from a technical standpoint and what is attainable from a political perspective.

Policy recommendations

When looking ahead to the next meeting of the BWC Working Group and beyond, it is clear that there is much to do and relatively limited time allocated to the BWC in a busy disarmament calendar.

Developing a shared vision for verification

Given the differences over the objectives, conceptualisation, scope, and definition of verification discussed above, one important policy recommendation for the short term is the development of a shared vision for BWC verification that provides some clarity on what such a mechanism would seek to do and what it would not do. Having conceptual clarity around this point could serve as the foundation for the further development of a road map to advance the discussion around this difficult topic.

Developing mechanisms to review developments in science and technology

As indicated above, science and technology are advancing, converging and diffusing around the globe, often at a rapid pace. In order to follow developments in science and technology and identify emerging risks and opportunities for the BWC, some form of scientific and technological mechanism will be required. Such a mechanism is on the agenda for the BWC Working Group and has some support from a range of states. However, issues remain around the composition of any scientific group, among other things. Should states be able to make progress on such a mechanism, it could potentially generate a number of knock-

[34] Ibid.

[35] H. Wilson et al., "Arms Control 2.0? With Open Source Tools, Desktop Sleuths Can Go Where Governments Won't", *Bulletin of the Atomic Scientists*, 2020, https://thebulletin.org/2020/07/arms-control-2-0-with-open-source-tools-desktop-sleuths-can-go-where-governments-wont/.

on effects, including robust scientific analysis of threats and opportunities, including in terms of verification tools, and in the process actively facilitate international cooperation and knowledge sharing among BWC states parties.

Developing a mechanism to promote international cooperation

Progress in developing a verification mechanism or establishing a science and technology review mechanism is unlikely to be achieved without progress under Article X of the BWC, specifically the establishment of a mechanism for international cooperation. Article X has become increasingly important for the evolution of the BWC, particularly to many states from the Non-Aligned Movement that have indicated frustration with what some see as an uneven distribution of the benefits of biotechnology, which is further compounded by a separate export control regime. Developing a mechanism through the Working Group to facilitate international cooperation and promote the transfer of technology could go some way to unlocking progress in other aspects of the Working Group and incentivise efforts to enhance the implementation of the BWC.

Ensuring a division of labour between the national and international levels

Strengthening the biological weapons regimes cannot be achieved purely through work at the international level. Rather, a division of labour is required between international activities and those undertaken domestically to implement the BWC and wider obligations. It is encouraging that much has already been done in this regard, which is evident in the BWC national implementation database currently being developed by the UN Institute for Disarmament Research and the Verification Research, Training, and Information Centre,[36] which utilises official and open-source material. However, national implementation is an evolving process, and states will need to continue to ensure that national implementation measures remain effective in both prohibiting and preventing the development and use of biological weapons. The Working Group agenda item on national implementation offers an opportunity to reinvigorate discussion around this issue, exchange ideas around good practices and build transparency around activities at the national level.

Building institutional support

One key initiative that would eventually strengthen the BWC should be expanding the ISU's capabilities. In comparison to the OPCW, the ISU consists of limited staff – four persons – and a budget that constrains the scope of its activities. If BWC states parties agree to any additional activities, the ISU will require a

[36] See Biological Weapons Convention National Implementation Database, 2024, https://bwcimplementation.org.

significant expansion of both staff and financial resources.[37] Several states have indicated support for the institutional strengthening of the BWC, with some, such as Kazakhstan, proposing the establishment of an international agency for biological safety.[38] Such an agency is yet to be agreed, but it is evident that ensuring compliance with the BWC and building robust measures to investigate allegations of breaches, as well as facilitating implementation support and international cooperation and building biosecurity, will require expanding the ISU.

Conclusion

The establishment of the Working Group certainly presents a glimmer of hope for strengthening the BWC. The task ahead is, of course, neither simple nor straightforward, and limited time and resources are available to states. Nonetheless, they should seize this opportunity to strengthen the BWC in a holistic manner. There is much that could theoretically be done to address the issues laid out above; however, in order to be politically acceptable, it will likely require some sort of package of measures that reflects the interests of all states.

[37] Revill, 2023, p.10.

[38] A. Assaniyaz, "Experts Discuss Kazakhstan's Initiative to Create Global Agency to Address Biosecurity Issues", *Astana Times*, 15 April 2022, https://astanatimes.com/2022/04/experts-discuss-kazakhstans-initiative-to-create-global-agency-to-address-biosecurity-issues/.

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ISBN: 978-2-88947-428-8

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