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## **Science and Technology Advisory Mechanism for the Biological Weapons Convention**

### **A Proof-of-Concept Exercise**

#### **Procedural Report**

## **I. Introduction**

The Biological and Toxin Weapons Convention (BWC), in force since 1975, prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons. The BWC includes participation from 184 States Parties, but despite its extensive reach, it lacks a scientific advisory mechanism to assess and respond to rapid advancements in science and technology (S&T), a notable gap when compared to chemical and nuclear weapons regimes.

To address this gap, the InterAcademy Partnership (IAP) in collaboration with the U.S. National Academies of Sciences, Engineering, and Medicine (NASEM) piloted a proof-of-concept simulation of a BWC scientific advisory mechanism. Such a mechanism would provide BWC States Parties with impartial analyses and assessments of emerging biotechnologies and developments in S&T, such as synthetic biology, novel gene editing techniques, and the convergence of artificial intelligence with the life sciences. It would support states in evaluating risks and benefits from scientific advances, inform their policy decisions, assist them in fulfilling their compliance obligations, and prevent the misuse of biological agents. Such a mechanism would also be useful in promoting international cooperation and exchange of knowledge on novel advances in S&T, as well as contributing to informed national policy making on biosecurity issues.

In line with the decision of the 2022 BWC Ninth Review Conference to "develop with a view to establishing a mechanism to review and assess scientific and technological developments relevant to the Convention and to provide States Parties with relevant advice," the IAP proof-of-concept exercise sought to simulate the functioning of such a mechanism. The simulation exercise also aimed to build on the common understanding evident during and after the Review Conference that the mechanism would be based on a so-called "hybrid model," with an open-ended body to ensure inclusiveness through the participation of all BWC States Parties, and a limited-size body, with a smaller number of experts for a more focused and effective discussion.

The exercise began with a virtual meeting simulating an open-ended body of the proposed mechanism, which took place on 14 November 2023, and aimed to narrow down the focus for the subsequent in-person session. The second session, simulating a limited-size body, was held in Trieste, Italy, on 26-28 February 2024. It involved a smaller group of technical experts who further deliberated the more refined questions.

After distributing the reports of these meetings, the project implementers assessed the processes and procedures of the exercise, hoping that their assessment (contained in this report) could be a useful contribution to how a future scientific advisory body might operate.

## Project Objectives and Methodology

The implementers of this proof-of-concept exercise aimed to assess the effectiveness of a hybrid scientific advisory mechanism for the BWC and clarify key procedural aspects:

- Topic Selection: How would relevant BWC-related scientific advancements be chosen for exploration?
- Expert Selection: What criteria would ensure qualified and diverse participation?
- Agenda Development: How would the meeting agendas be structured and agreed upon for open and focused discussions?
- Report Creation: How would reports be drafted, reviewed, and finalized by participants?
- Inclusiveness and Transparency: What measures would guarantee broad geographic representation and open communication?

Originally planned as a single meeting, the organizers realized a two-part approach was needed to test the hybrid model effectively.

- Virtual Event (14 November 2023): This simulated the open-ended body with two sessions (morning/afternoon) to accommodate global participation. The two sessions had identical agendas (Annex 1).
- In-Person Event (26-28 February 2024, Trieste): This simulated the limited-size body for deeper discussions (Annex 2).

The simulation tested the practicality and effectiveness of the hybrid advisory model currently under discussion by BWC States Parties, evaluating its ability to foster substantial scientific discourse, consensus-building, and resolution of BWC-specific challenges. This model is called hybrid because it has two segments: an open-ended body for broad participation by interested experts; and a limited-size, in-person segment for focused, deeper technical discussions, needed to demonstrate operational feasibility and effectiveness in enhancing the BWC's decision-making capabilities. In this regard, implementers drew on the Working Papers and initiatives of BWC States Parties, as well as the 2020-21 meetings of UNIDIR and workshops of the Federation of American Scientists. Both IAP events were by invitation only and operated under the Chatham House Rule.

The chosen topic for deliberation was the integration of artificial intelligence (AI) with life sciences within the BWC context. This topic, both pressing and relevant, was highlighted by the surge in global attention and initiatives concerning machine learning in 2023. The organizers opted for a broad initial scope, allowing the open-ended group to refine the discussion focus for the limited-size body.

Because the exercise focused on the convergence of AI with life sciences, it drew on a multidisciplinary global expert pool, prioritizing scientific credentials, geographic representation, and inclusivity to foster cooperation. Experts in life sciences were drawn from national academies that are within the IAP network, as well as from experts referred by BWC States Parties and other sources. IAP has access to top-level scientists from about 150 national academies in over 100

countries worldwide, as well as from a Biosecurity Working Group. IAP and NASEM also reached out to other experts within their networks, and advice was sought from academies and other scientific institutions.

The selection of experts focused on scientific credentials over nationality and maintained a balance across the five geographic regions defined by the UN regional group structure (rather than traditional BWC groupings), as well as gender and career-stage balance. Implementers realized that such an advisory body would benefit from a wide variety of expertise, to include the life sciences as well as social sciences. The exercise highlighted the critical need for maintaining the independence and objectivity of the advisory mechanism, as well as the need to ensure a transparent deliberative process.

The agenda was designed to be inclusive, and participants were assigned roles such as Chair, Vice-Chairs, Rapporteurs, a Scientific Advisor, and an Implementation Support Unit for the in-person meeting. The draft report process was expedited compared to typical advisory body timelines, involving an overnight drafting of the report by the Scientific Advisor and multiple iterations of the draft report based on discussions at the in-person meeting. Such a reporting process would likely take a month to complete in an established scientific advisory board. The final report was consolidated by the implementers and shared with participants before broader distribution.

This methodology reflects the exercise's commitment to simulating a realistic and effective scientific advisory mechanism for the BWC, highlighting procedural robustness and inclusivity.

## Results and Impact

The proof-of-concept exercise demonstrated that a hybrid structure, comprising an open-ended body and a limited-size body, can effectively foster substantial discussions on novel BWC-related topics. This structure, starting with a broad discussion in a larger group and transitioning to focused deliberation in a smaller one, proved valuable, contingent upon a balance of expertise, geographic representation, gender, and career stage. The virtual format of the first phase provided flexibility, while the in-person meeting in Trieste capitalized on IAP's logistical expertise – including securing visas for those who needed them – demonstrating the complexities of international participation.

The focus on the convergence of AI and biosecurity required expertise beyond traditional life sciences. The meetings benefitted from the implementers' connections with the diverse network of academies of IAP, NASEM, and contacts with the international diplomatic and scientific community. This underscores the need for access to multidisciplinary knowledge to make such a mechanism operationally effective. The technical report from the Trieste meeting (Annex 2), put forward by the Science Advisor assigned for the simulation, highlighted the dual success of the exercise: simulating the advisory mechanism's convening process and its deliberative functions.

International cooperation emerged as critical, with the diverse expert group providing a platform for knowledge exchange and consensus building that is essential for addressing complex, global S&T challenges. The inclusion of observers, such as diplomats and non-participant scientists,

highlighted the need for a balance between openness and confidentiality in proceedings, enhancing transparency while safeguarding confidential discussions.

The exercise affirmed the potential of an S&T advisory mechanism within the BWC to provide vital, multifaceted analyses of emerging biosecurity risks and technologies. Lessons from the simulation emphasized the importance of a broad disciplinary approach, incorporating the life sciences as well as social sciences, to fully understand and address biosecurity challenges.

A key question was whether the two proposed segments (open-ended and limited-size) would add genuine value beyond meeting political needs. The project implementers assessed that each segment provided unique contributions in terms of scientific discussion, consensus-building, and addressing BWC-specific technical challenges. Participants suggested that there were benefits from a flexible approach to expert engagement through standing, open-ended and limited-size bodies, as well as the possibility to form temporary, topic-specific working groups. This adaptability is crucial for the mechanism to respond to evolving S&T landscapes.

Finally, maintaining the independence of the advisory mechanism is paramount. Project implementers found that the exercise demonstrated the benefits of a transparent selection process for advisors, emphasizing expertise over political or national affiliations, and highlighted operational practices like personal name tags to reinforce individual rather than state representation. These measures are crucial to ensure the mechanism's advice remains objective and free from undue influence, thereby supporting the BWC's integrity and effectiveness in a rapidly changing global context.

## II. Conclusions

This proof-of-concept exercise provides compelling evidence that a dedicated S&T advisory mechanism within the BWC, structured with open-ended and limited-size bodies, is both feasible and beneficial. The rapid evolution of S&T presents both opportunities and challenges that necessitate informed, timely, and expert guidance to ensure the BWC remains effective and relevant. The simulations underscored the critical role such a mechanism can play in enhancing the BWC's capacity to manage these developments effectively. The implementers conclude that such an S&T advisory mechanism would provide independent advice that can contribute to the BWC's decision-making and lend credibility to the Convention's processes.

The simulation demonstrated that a hybrid mechanism is not a political compromise, but that it offers tangible benefits. It enables a thorough exploration of issues, where the open-ended body identifies and refines topics for deeper analysis by the limited-size body. This structure adds significant value by enabling detailed expert scrutiny of specific challenges and opportunities, thus providing more refined, actionable guidance to BWC States Parties and enhancing the quality and applicability of the advice.

The initial setup of the S&T advisory mechanism is crucial to its success. Key considerations for the BWC States Parties include:

- Establishing clear criteria and processes for member selection to ensure the mechanism's independence and the continual introduction of new ideas.
- Defining precise methods for identifying topics for consideration.
- Developing robust protocols that balance transparency and confidentiality, ensuring open communication while protecting sensitive information.
- Implementing strategic outreach and communication plans to effectively engage all stakeholders and ensure the mechanism's work is both understood and utilized by BWC States Parties and the broader international community.

The insights from the successful proof-of-concept could contribute to a consensus decision to establish such a body at the next BWC Review Conference. The careful planning and establishment of the S&T advisory mechanism are crucial for enhancing the BWC's ability to navigate the complex interplay of science, technology, international cooperation, and international security. By following these recommendations, the BWC can improve its responsiveness, credibility, and effectiveness in safeguarding global biosecurity. Establishing an S&T advisory mechanism would not only bolster the authority of the BWC as an international instrument, but also build confidence in its processes.

### **III. Annexes**

#### **1. 14 November 2023 meeting report**

[Read it here.](#)

#### **2. 27-28 February 2024 Trieste meeting report**

[Read and download it here.](#)