



COMPLIANCE
AND ENFORCEMENT IN
THE BIOLOGICAL
WEAPONS REGIME

FILIPPA LENTZOS

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ABOUT THE AUTHOR



FILIPPA LENTZOS is a Senior Research Fellow at King's College London, where she holds a joint appointment in the Department of War Studies and the Department of Global Health and Social Medicine. She is also an Associate Senior Researcher within the armament and disarmament programme at the Stockholm International Peace Research Institute; a biosecurity columnist for the *Bulletin of the Atomic Scientists*; an editor of the journal *BioSocieties*; and the NGO Coordinator for the Biological and Toxin Weapons Convention. A biologist and social scientist by training, Lentzos has researched and been actively involved in biological disarmament and non-proliferation for over 15 years. Her edited volume *Biological Threats in the 21st Century: The politics, people, science and historical roots* was published by Imperial College Press in 2016. For more about her work see www.filippalenzos.com and for regular updates follow her on Twitter: @FilippaLentzos

ABBREVIATIONS AND ACRONYMS

AHG	Ad Hoc Group
BW	biological weapons
BWC	Biological and Toxin Weapons Convention
CBMs	confidence-building measures
CWC	Chemical Weapons Convention

SUMMARY

- This paper takes stock of the mechanisms that are currently available for attempting to determine and ensure compliance with the Biological Weapons Convention (BWC). It presents three conceptual layers of BWC compliance: one legally binding, one politically binding, and one wholly voluntary. The paper also describes a fourth, elusive layer—the verification layer—which remains one of the fundamental challenges of biological disarmament and non-proliferation.
- The main role and responsibility for BWC compliance falls squarely on States Parties. Up to now, each State Party has relied upon its own resources to assess the compliance of other States Parties. Collective determination of compliance would be a step forward, if it were ever to become politically acceptable.
- The Implementation Support Unit supports States Parties in their efforts to implement the BWC. The Security Council acts as the final arbitrator on allegations of compliance breaches. It has not to date been requested to investigate any allegations. The World Health Organization, the Food and Agriculture Organization of the United Nations and the World Organization for Animal Health have potential roles in clarifying ambiguous events and situations. However, they only provide expert information to help States Parties—this does not amount to determining compliance.
- This paper underlines that the biological disarmament regime will require new thinking about the structures, science and actors involved in the governance of dual use. It concludes by sketching an incremental, forward-looking approach to strengthening BWC compliance-monitoring.

1 INTRODUCTION:

A LAYERED REGIME OF COMPLIANCE

Biological weapons (BW) are the least well understood of the so-called weapons of mass destruction. Biological weapons have never been used openly on the battlefield. Their development has always been shrouded in intense secrecy. While crude attempts to intentionally inflict disease have a long history, it was the revolution in microbiology around the beginning of the twentieth century that transformed ignorance about infection into sophisticated understanding, and, along with advances in aerobiology, opened the door to the systematic design and development of BW with potentially massive effect.

Over the past century, about 25 States are believed to have possessed an offensive BW programme for some period of time.¹ Most programmes were apparently of short duration. They were small and developed limited, unsophisticated capabilities. The goals of these programmes were often unclear yet appear to have ranged from deterrence to providing an asymmetric force multiplier, be it through intimidation, tactical military use, covert warfare, sabotage, counterinsurgency, or State-sponsored terrorism and assassination.² The small size and covert nature of some of these BW programmes made them difficult to discover and many were identified only after they had ended.

Only two States are known to have had sophisticated capabilities that could inflict mass casualties or extensive economic harm: The United States and the Soviet Union. Both programmes were extensive and involved research and testing of agents, including large-scale field trials and testing on human subjects; industrial production and stockpiling of agents; the manufacture of delivery systems; doctrinal development for their use in warfare; and training of troops. The unilateral renunciation of BW by the United States and termination of its offensive programme in 1969 facilitated multilateral negotiations on a treaty to comprehensively ban BW.

The Biological and Toxin Weapons Convention (BWC) entered into force in 1975 and prohibits the development, production, acquisition, transfer, stockpiling and, indirectly,³ the use of biological and toxin weapons. The treaty is a product of its time, with early drafts conceived by the United Kingdom but negotiated primarily by the two Cold War

¹ Carus, W. Seth. 2017. "A Century of Biological-Weapons Programs (1915–2015): Reviewing the Evidence". *The Nonproliferation Review* 24 (1–2): 129–53. <https://doi.org/10.1080/10736700.2017.1385765>; Lentzos, Filippa. 2016. *Biological Threats in the 21st Century: The Politics, People, Science and Historical Roots*. <https://doi.org/10.1142/P1081>; Wheelis, Mark, Lajos Rózsa and Malcolm Dando (eds). 2006. *Deadly Cultures: Biological Weapons since 1945*.

² Carus, W. Seth. 2017. "A Century of Biological-Weapons Programs (1915–2015): Reviewing the Evidence". *The Nonproliferation Review* 24 (1–2): 129–53. <https://doi.org/10.1080/10736700.2017.1385765>.

³ The BWC does not expressly prohibit use, but it was expressly accepted by States Parties that it does so under all circumstances at the Fourth Review Conference in 1996, and this has been reaffirmed at the Sixth, Seventh and Eighth Review Conferences.

superpowers. This triad—the Soviet Union/Russian Federation, the United Kingdom and the United States—continue their stewardship of the treaty by acting as the depository States.

The treaty itself is relatively brief, comprising only fifteen articles. These articles cover several negative obligations not to develop, produce, acquire, transfer or stockpile BW (articles I and III), as well as an obligation to avoid hampering economic or technological development of States Parties (article X). The treaty also contains positive obligations, including to take any necessary domestic measures to prohibit and prevent BW (article IV) and to “co-operate in carrying out any investigation which the Security Council may initiate” (article VI). Over the years, the treaty articles have been supplemented by a series of Additional Understandings reached at subsequent Review Conferences, held in 1980, 1986 and every five years since then. In addition, a growing array of other measures have augmented the BW prohibition regime such as strategic export control regimes and Security Council resolution 1540, which serve to bolster aspects of the prohibition and prevention of BW.

The term ‘verification’, traditionally thought of as the foundation of post-Second World War weapons treaty compliance regimes, does not feature in the text of the BWC. The lack of a verification mechanism is “not there through some oversight or through ineptness on the part of the drafters”.⁴ Rather, it reflects the negotiated result of different positions and calculations.

As with ‘verification’, the term ‘enforcement’ does not feature in the BWC. The one place where it can be found, as a concept not a word, is in the ‘prevent’ obligation in article IV—a much more stringent criterion than ‘prohibit’.⁵ Yet, this refers to domestic enforcement by each State Party applied against actors within its jurisdiction or control. Enforcement measures applied against a State Party are not covered. Logically, enforcement against a State Party could only follow an investigation through article VI, because only after such an investigation could the Security Council find a State Party to be in violation of the BWC. And only the Security Council has the authority, under the Charter of the United Nations, to enforce anything at all; but it is a tenuous chain of authority and far from automatic.⁶ Instead of enforcement, the BWC relies on action under article VII to limit the impact of a BWC violation by a State Party through humanitarian assistance to the State Party requesting it after a Security Council determination. Article VII was also intended to demonstrate solidarity among States Parties and to deter any State Party contemplating a breach of the treaty. These actions stop well short, however, of the ‘harder’ enforcement measures outlined in Dunworth’s primer on compliance and enforcement in this series of papers.⁷

Today, publicly available information on possible illicit BW activity is limited. There is no independently verified public reporting that any States is maintaining an offensive BW

⁴ Westing, Arthur H. 1985. “The Threat of Biological Warfare”. *BioScience* 35 (10): 627–33. <https://doi.org/10.2307/1309988>. p. 632.

⁵ Author’s personal communication with Nicholas A. Sims, August 2019.

⁶ Sims, Nicholas A. 1988. *The Diplomacy of Biological Disarmament: Vicissitudes of a Treaty in Force, 1975-85*.

⁷ Dunworth, Treasa. 2019. *Compliance and Enforcement in WMD-Related Treaties*. WMDCE Series No. 1. UNIDIR.

programme. Yet concerns about BW have endured and are now escalating.⁸ One source of the growing concern about future BW threats stems from scientific and technical advances in manipulation of genes and biological systems, as well as in enabling technologies such as advanced artificial intelligence, machine learning, nanotechnology and additive manufacturing.⁹ There are also concerns about the 'democratization' of biology, and that more people are gaining access to genetic engineering technologies, which could create more opportunities for individual endeavours to be translated into hostile misuse of biology.¹⁰

These developments are taking place amid wider changes in the geostrategic landscape that create uncertainty. Particularly relevant are, first, a worldwide increase in the number, size and scope of biodefence programmes;¹¹ second, an expansion of 'grey zone' activities that fall between legitimate defensive work and prohibited offensive work (and on which perceptions differ most strongly on what qualifies as defensive or offensive biological activities);¹² third, a potential erosion of constraints on BW use;¹³ and, finally, possible changes in the warfighting requirements of militarily powerful States. A key question of our time is whether this picture will alter the balance of incentives and disincentives to comply with the BWC.

This paper takes stock of the mechanisms that are currently available for attempting to determine and ensure compliance with the BWC. One way to think about BWC compliance is as a series of layers. Nicholas Sims first presented this idea in his volume *The Evolution of Biological Disarmament*.¹⁴ Building on this, three conceptual layers of compliance are presented here: one legally binding, one politically binding, and one wholly voluntary. Sims discerned the original elements of the compliance regime to be articles IV–VII. These constitute the first layer and are discussed in the next section. Emanating from article V in layer one are two additional layers: the confidence-building measures (section three) and other compliance measures short of verification (section four). This paper charts the development, historical context and present-day status of the three layers, and highlights

⁸ Lentzos, Filippa. 2019. "Re-Thinking Biological Arms Control for the 21st Century". *Fletcher Security Review* 6 (1): 33–36. https://docs.wixstatic.com/ugd/c28a64_40c33df0dea8425db1fdb313f49d2310.pdf; Lentzos, Filippa. 2018. "Strengthen the Taboo against Biological and Chemical Weapons". *The Bulletin of the Atomic Scientists*. https://thebulletin.org/2018/07/strengthen-the-taboo-against-biological-and-chemical-weapons/?utm_source=Twitter&utm_medium=TwitterPost&utm_campaign=Taboo_July26.

⁹ Brockmann, Kolja, Sibylle Bauer and Vincent Boulanin. 2019. "BIO PLUS X Arms Control and the Convergence of Biology and Emerging Technologies". SIPRI. https://www.sipri.org/sites/default/files/2019-03/sipri2019_bioplusx_0.pdf.

¹⁰ Spiez Laboratory. 2016. "Spiez CONVERGENCE Report on the Second Workshop". https://www.labor-spiez.ch/pdf/en/Report_on_the_second_workshop-5-9_September_2016.pdf.

¹¹ Lentzos, Filippa and Gregory Koblenz. 2016. "21st Century Biodefence: Risks, Trade-Offs & Responsible Science". BWC Review Conference Series. The International Law and Policy Institute.

¹² Lentzos, Filippa, and Jeremy Littlewood. 2018. "DARPA's Prepare Program: Preparing for What?". *Bulletin of Atomic Scientists*.

¹³ Koblenz, Gregory D. 2019. "Historical Aspects of Biological Weapons Development and Use", in Singh, Sunit K. and Jens H. Kuhn (eds). *Defense Against Biological Attacks: Volume I*. pp. 1–18. https://doi.org/10.1007/978-3-030-03053-7_1.

¹⁴ Sims, Nicholas Roger Alan. 2001. *The Evolution of Biological Disarmament*. SIPRI Chemical & Biological Warfare Studies No. 19.

the roles and responsibilities of key stakeholders. Section five describes a layer that remains one of the fundamental challenges for biological disarmament and non-proliferation: the verification layer. The paper concludes by sketching an incremental, forward-looking approach to strengthening BWC compliance monitoring.

2 ARTICLES IV-VII

Verification of the BWC poses unique and substantial challenges because of the dual-use nature of the materials, equipment and technical know-how required for a BW programme. These challenges are compounded by the diffusion of materials, equipment and technical know-how across multiple and varied scientific disciplines and sectors. Moreover, biological agents themselves exist in nature and are living organisms generally capable of natural reproduction and replication. As such, biology defies material accountancy-type verification methodologies, like those described in Trapp's paper in this series on the chemical weapons regime.¹⁵ The issue for BWC compliance is therefore "much more one of transparency, insight and candour, rather than material balances or counting discrete objects such as fermenters", as a recent United Kingdom working paper noted.¹⁶

This need for a different, more qualitative approach to ensuring compliance has been the United Kingdom's view since its inception of the treaty. In a 1968 statement to the predecessor of the Conference on Disarmament, the United Kingdom noted that "no verification is possible in the sense of the term as we normally use it in disarmament discussions".¹⁷ In other words, it is not possible to verify the BWC with the same level of accuracy and reliability as the verification of nuclear treaties discussed by Heinonen's paper in this series.¹⁸ Despite believing that "it is beyond the wit of man to devise" a fully effective system of verification, the British government felt that certain arrangements could satisfy States that they would not expose themselves to unacceptable risks by joining the treaty.¹⁹ The draft Convention the United Kingdom developed and put forward in 1969 delineated what were later called 'functional substitutes' for unattainable verification.²⁰ These arrangements were drastically diluted by the superpowers in their negotiations of the text. The final version of the treaty was left with only four functional verification substitutes:

- Article IV obliging parties to ensure national implementation of the treaty through legislation or other constitutional processes as necessary to give it legal effect.
- Article V obliging parties to consult and cooperate.

¹⁵ Trapp, Ralf. 2019. Compliance Management under the Chemical Weapons Convention. *WMDCE Series No. 3*. UNIDIR.

¹⁶ United Kingdom. 2019. "Institutional strengthening of the Convention: Reflections on the 2001 Protocol and the verification challenge". BWC Meeting of States Parties. BWC/MSP/2019MX.5/WP.1. 10 July 2019.

¹⁷ Mulley, Frederick W. 1968. "Statement by Frederick W. Mulley, Minister of State at the Foreign Office, United Kingdom". Eighteen-Nation Disarmament Committee. ENDC/ PV.387. 6 August 1968.

¹⁸ Heinonen, Olli. 2019. The IAEA Mechanisms to Ensure Compliance with Nuclear Non-Proliferation. *WMDCE Series No. 2*. UNIDIR.

¹⁹ Mulley, Frederick W. 1968. "Statement by Frederick W. Mulley, Minister of State at the Foreign Office, United Kingdom". Eighteen-Nation Disarmament Committee. ENDC/ PV.387. 6 August 1968.

²⁰ Sims, Nicholas. 2000. "Verifying Biological Disarmament: Towards a Protocol and Organisation", in Findlay, Trevor (ed.). *Verification Yearbook 2000*. pp. 87–99. VERTIC.

- Article VI providing any party that finds any other party acting in breach of its obligations the right to lodge a complaint with the Security Council.
- Article VII obliging parties to provide or support assistance to a victim of a BW attack “if the Security Council decides that such Party has been exposed to danger as a result of violation of the Convention”.

Foremost of these provisions is article V. Additional Understandings on article V as a functional verification substitute were developed over the course of the first three BWC Review Conferences.²¹ In the original UK draft convention of 1969, complaints about alleged BW use were to have been entrusted to the Secretary-General, who was to investigate such complaints and report the results to the Security Council. The final, agreed version of the treaty, however, bypassed the Secretary-General in favour of the Security Council, enabling the two superpowers, along with China, France and the United Kingdom, to veto any potential investigations of their own activities or those of their allies.

Subsequently, Sweden led a push to strengthen BWC verification provisions at the First Review conference in 1980, and proposed the addition of a ‘Consultative Committee’, “in effect separating the initial consultation and fact-finding element of potential or alleged non-compliance from the political consideration of the issue in the Security Council”.²² Tough negotiations ensued, which resulted in partial success for Sweden and its allies on this issue. The Final Declaration identified procedures implicit within article V that included the right of any State Party “to request that a consultative meeting open to all States Parties be convened at expert level” to discuss and consider any problem brought before it.²³ This clarification “pointed towards an accepted procedure to be followed in the event of non-compliance concerns being raised formally and followed up under the provisions of the BWC, either individually or collectively”.²⁴

Seventeen years later, the procedures were put to the test. *Thrips palmi* insects had ravaged the Cuban potato crop in Matanzas province in December 1996. Cuba accused the United States of ‘biological aggression’ over Cuban territory, and a formal consultative meeting was convened in 1997.²⁵ The consultative process was used successfully, in so far as both Cuba and the United States and many other delegations were satisfied with the handling of the consultative process. Nevertheless, it left undetermined the verdict on the Cuban allegation against the United States.²⁶ The process was, however, widely seen as fulfilling the obligations under article V, and it allowed States to have their say.²⁷

²¹ Sims, Nicholas Roger Alan. 2001. *The Evolution of Biological Disarmament*. SIPRI Chemical & Biological Warfare Studies No. 19.

²² Littlewood, Jeremy. 2004. *The Biological Weapons Convention: A Failed Revolution*. p. 18.

²³ BWC. 1980. “Final document”. BWC First Review Conference. BWC/CONF.I/10. 21 March 1980. pp. 7–8.

²⁴ Littlewood, Jeremy. 2004. *The Biological Weapons Convention: A Failed Revolution*. p. 18.

²⁵ BWC. 1997. “Report of the Formal Consultative Meeting of the States Parties to the BWC”. BWC Consultative Meeting. BWC/CONS/1. 29 August 1997.

²⁶ Sims, Nicholas. 2001. *The Evolution of Biological Disarmament*. SIPRI Chemical & Biological Warfare Studies No. 19.

²⁷ Revill, James. 2016. “A Study on Enhancing the Consultation Provisions of Article V of the Biological Weapons Convention”. Report submitted to the EU. p. 4.

There have been no other uses of article V in its multilateral mode, although several 'informal' consultative meetings have taken place. In its closing remarks to the BWC First Review Conference in 1980, after the Final Declaration had been agreed, the United States referred to the outbreak of anthrax at Sverdlovsk in the Soviet Union in 1979, "which raised questions whether a lethal biological agent had been present in the Soviet Union in quantities inconsistent with the provisions of the Convention".²⁸ The Sverdlovsk outbreak led to intense speculation about its origin. Was it a natural outbreak resulting from the consumption of infected meat that had not been subjected to the normal inspection before sale, as the Soviet Union claimed? Or was it an accidental release of anthrax from a BW facility, as the United States and United Kingdom alleged? The case was never subjected to the treaty's investigation provisions under article VI, probably because the Soviet Union, as a permanent member of the Security Council, would have the right to veto any such investigation anyway. Although the United States and the Soviet Union did consult with one another bilaterally over the Sverdlovsk issue, regrettably it turned out to be a "dialogue of the deaf" which resolved very little.²⁹

The Sverdlovsk case was not the only 'informal' article V consultation to come to light.³⁰ The best known are the diplomatic and political pressures exerted by the United States and the United Kingdom on the Russian Federation in the early 1990s, after the Soviet Union dissolved, to get it to admit that the Soviet Union had possessed an offensive BW programme and to take steps to dismantle the programme and convert the relevant facilities to protective or peaceful purposes. This effort led to a Joint US–UK–Russian Federation Statement on Biological Weapons publicly presented in September 1992. This Statement included provision for a series of short notice inspection visits to "any non-military biological site" and "visits to any military biological facility, on a reciprocal basis ... on the basis of agreed principles".³¹ Extensive diplomatic and technical negotiations ensued in an effort to agree on the details of and procedures for the visits. In the end, three rounds of site visits took place before they came to an abrupt halt. The Trilateral Agreement, as it became known, had "failed dramatically", in the words of one insider.^{32,33}

²⁸ BWC. 1980. "Summary record of the twelfth meeting". BWC First Review Conference. BWC/CONF.I/SR.12. 21 March 1980. p. 3.

²⁹ Sims, Nicholas. 2001. "Four Decades of Missed Opportunities to Strengthen the BWC: 2001 Too?". *Disarmament Diplomacy* 58: 15–22. p. 16; Meselson, Matthew et al. 1994. "The Sverdlovsk Anthrax Outbreak of 1979". *Science* 266 (5188): 1202–8.

³⁰ Other examples include: United States in BWC. 1986. "Summary Record of the Third Plenary Meeting". BWC Second Review Conference, BWC/CONF.II/SR.03. 9 September 1986. p. 5. For the Soviet response to claims, see USSR in BWC. 1986. "Summary Record of the Seventh Plenary Meeting". BWC Second Review Conference, BWC/CONF.II/SR.7, p. 13.

³¹ See the Joint US/UK/Russian Statement of Biological Weapons, issued by the US Department of State on 14 September 1992. Available in Annex D in Leitenberg, Milton and Raymond A. Zilinskas. 2012. *The Soviet Biological Weapons Program: A History*.

³² Kelly, David. C. 2002. "The Trilateral Agreement: Lessons for Biological Weapons Verification". *Verification Yearbook*. pp. 93–110. http://www.vertic.org/media/Archived_Publications/Yearbooks/2002/VY02_Kelly.pdf.

³³ For more on the Trilaterals, see Walker, John R. 2012 "The Leitenberg-Zilinskas history of the Soviet biological weapons programme". Harvard Sussex Programme Occasional Paper issue 02. http://www.sussex.ac.uk/Units/spru/hsp/occasional%20papers/HSPOP_2.pdf.

Despite its failure to conclusively determine whether the Russian Federation complied with the BWC, the 'trilateral process' resulted in a number of significant achievements. It encouraged Russian President Yeltsin's private admission of a past offensive Soviet BW programme to his British and American counterparts. It provided evidence of Soviet non-compliance from 1975 to 1991, explicitly acknowledged in the Russian confidence-building measures submission of 1992, and led to the Russian Federation's decision to drop the Soviet reservation to the 1925 Geneva Protocol, which had preserved its right to retaliate in kind if attacked with BW. It also provided insights for any future biological verification initiatives, including a better understanding of the difficulties of short notice inspections and the risk of 'political interpretations' in technical assessments.³⁴ Many analysts felt, however, that the trilateral process was a lost opportunity for the Russian Federation to demonstrate unambiguously its current compliance with the BWC.³⁵

It is difficult to put an accurate figure on the number of 'informal', or 'invisible', consultations that have taken place within the framework of article V, though consultations on significant compliance concerns are likely to be rare.³⁶ Efforts are ongoing to reinforce the consultative arrangements created by previous Review Conferences for article V.³⁷

³⁴ Kelly, David. C. 2002. "The Trilateral Agreement: Lessons for Biological Weapons Verification". *Verification Yearbook*. pp. 93–110. http://www.vertic.org/media/Archived_Publications/Yearbooks/2002/VY02_Kelly.pdf.

³⁵ See, for instance, Walker, John R. 2012. "The Leitenberg-Zilinskas history of the Soviet biological weapons programme". Harvard Sussex Programme Occasional Paper issue 02. http://www.sussex.ac.uk/Units/spru/hsp/occasional%20papers/HSPOP_2.pdf.

³⁶ The United Kingdom, for example, has not initiated any such consultations since the Trilaterals. Author's personal communication with John R. Walker, August 2019.

³⁷ See, for instance, United States. 2016. "Strengthening confidence-building and consultative mechanisms under the Biological Weapons Convention". BWC PrepCom to the Eighth Review Conference. BWC/CONF.VIII/PC/WP.6. 21 April 2016; European Union. 2016. "Enhancing the effectiveness of the consultative provisions of Article V of the BWC". BWC Eighth Review Conference, BWC/CONF.VIII/WP.16, 31 October 2016; United Kingdom. 2019. "Institutional strengthening of the Convention: Reflections on the 2001 Protocol and the verification challenge". BWC Meeting of States Parties, BWC/MSP/2019/MX.5/WP.1. 10 July 2019.

3 THE CONFIDENCE-BUILDING MEASURES

The Second Review Conference in 1986 added a second layer to the compliance regime by introducing confidence-building measures (CBMs). Anchored in article V, the CBMs were introduced as a compromise measure following renewed calls to strengthen the BWC with a legally binding verification regime.³⁸ The calls had been sparked by, among other things, the suspicious anthrax outbreak in Sverdlovsk and by US allegations in 1981 of toxin use in Afghanistan and South-East Asia. At the time, it seemed plausible that a verification mechanism was going to be put in place that resembled the declarations and on-site inspections that were being negotiated at that time for the Chemical Weapons Convention (CWC). Many BWC States Parties also argued that it would be better to first conclude the negotiation of the CWC, which could then serve as a model for a possible BWC verification protocol. The CBMs were adopted by consensus as an interim measure “in order to prevent or reduce the occurrence of ambiguities, doubts and suspicions, and in order to improve international co-operation in the field of peaceful bacteriological (biological) activities”.³⁹

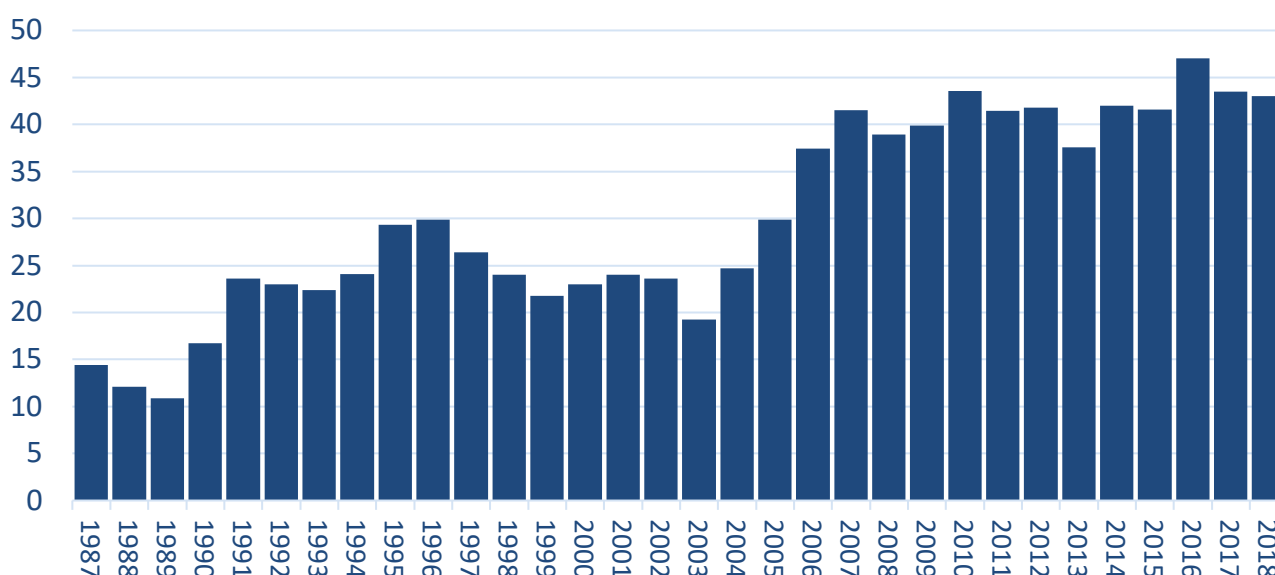


FIGURE.1 *Percentage of BWC States Parties making CBM submissions by year. Source: BWC Implementation Support Unit*

As it turned out, the verification protocol was not attainable in the 1990s or 2000s (of which, more later), and the CBMs remain the core, formal mechanism whereby BWC States Parties exchange compliance-related information on a regular basis. Submitted annually, the six

³⁸ Sims, Nicholas. 2001. *The Evolution of Biological Disarmament*. SIPRI Chemical & Biological Warfare Studies No. 19.

³⁹ BWC. 1986. “Final Document”. Second BWC Review Conference. BWC/CONF.II/13. 30 December 1986.

agreed forms are comprehensive in scope.⁴⁰ Unfortunately, participation in the mechanism remains limited (see figure 1)

Following their establishment at the Second Review Conference, the CBMs were elaborated at a meeting of scientific and technical experts in 1987. Later, these were modified and considerably expanded at the Third Review Conference in 1991. The emphasis between the end of the Cold War and the Fifth Review Conference in 2001 on seeking verification resulted in decreased interest in further developing the CBM measures. The Sixth Review Conference in 2006 agreed on various improvements to their submission and distribution mechanisms, but political differences meant the CBMs remained substantively unchanged until minor modifications to the reporting forms were adopted at the Seventh Review Conference in 2011.⁴¹ At the most recent Review Conference in 2016, there were renewed calls to generate more useful information by further refining the type and range of information requested in the CBMs.

Although the CBMs are not derived directly from the text of the Biological Weapons Convention itself, the Second Review Conference resulted in a consensus decision that States Parties were "to implement [the CBMs] on the basis of mutual co-operation".⁴² This decision means that participation in the CBMs is a politically binding requirement for all BWC States Parties. To maximize their transparency, an increasing number of States Parties are now also making their CBM submissions publicly available and thus available for analysis by civil society. At the 2016 Review Conference, 30 States Parties made their CBM submissions publicly available, 18 of which included information on their biodefence programmes.⁴³

⁴⁰ They include data on biodefence programmes, maximum containment facilities, national oversight frameworks implementing the treaty and regulating biological research, published articles or reports detailing results from research directly related to the treaty, unusual outbreaks of infectious diseases, vaccine production facilities, and details of any past BW activities. More details are available from www.unog.ch/bwc.

⁴¹ There were efforts by many States Parties to substantially improve the CBMs at the 2011 Review Conference, but these were not successful.

⁴² BWC. 1986. "Final Document". Second BWC Review Conference. BWC/CONF.II/13. 30 December 1986.

⁴³ Lentzos, Filippa. 2019. "Trust and Transparency in Biodefence", in Singh, Sunit K. and Jens H Kuhn (eds). *Defense Against Biological Attacks: Volume I*. pp. 53–68. https://doi.org/10.1007/978-3-030-03053-7_4.

4 COMPLIANCE MEASURES SHORT OF VERIFICATION

Also emanating from article V are some States Parties' recent voluntary efforts to go further to be transparent about their BWC national implementation and compliance. These efforts may be seen as constituting a third, and voluntary, layer, in a layered regime of BWC compliance.

Canada proposed a BWC 'compliance assessment' initiative in 2011.⁴⁴ The initiative approached the concept of compliance assessment from the broad perspective of examining national legislation and implementation programmes, rather than from the more traditional, focused perspective of inspecting facilities. Canada put itself forward to act as a test case and made an initial compliance assessment submission in the form of a Working Paper to the 2012 BWC meeting.⁴⁵ Other interested States were invited to join in the initiative, and Switzerland, the Czech Republic and France have all made similar national compliance assessments in the form of Working Paper submissions.⁴⁶

A more interactive arrangement was put forward by France around the same time as Canada proposed its compliance assessment initiative.⁴⁷ Here, participating States were to meet to undertake mutual assessments of national implementation standards based on common understandings reached during the intersessional process. Like the 'compliance assessment' submissions, the 'peer review' mechanism was also aimed at building confidence and providing transparency among States Parties. Additionally, this mechanism also aimed at improving national implementation and, importantly, providing an opportunity to share experiences and best practices among experts. France organized the first peer review exercise in 2013.⁴⁸ In 2015, Belgium, Luxembourg, and the Netherlands conducted a Benelux

⁴⁴ Canada. 2010. "National implementation of the BTWC: compliance assessment: a concept paper". BWC Meeting of States Parties. BWC/MSP/2010/WP.3/Rev.1. 7 December 2010.

⁴⁵ Canada and Switzerland. 2012. "National implementation of the BTWC: compliance assessment". BWC Meeting of Experts. BWC/MSP/2012/MX/WP.17. 3 August 2012.

⁴⁶ Canada, the Czech Republic and Switzerland. 2012. "National implementation of the BTWC: compliance assessment: update". BWC Meeting of States Parties. BWC/MSP/2012/WP.6. 5 December 2012; France. 2013. "National implementation assessment report of the Biological Weapons Convention". BWC Meeting of Experts. BWC/MSP/2013/MX/WP.16. 12 August 2013.

⁴⁷ France. 2011. "A peer review mechanism for the Biological Weapons Convention: enhancing confidence in national implementation and international cooperation". BWC Seventh Review Conference. BWC/CONF.VII/WP.28.

⁴⁸ France. 2014. "Peer review pilot exercise held from 4 to 6 December 2013 in Paris". BWC Meeting of States Parties. BWC/MSP/2014/WP.3. 13 December 2011.

peer review exercise among themselves based on a mutually developed and agreed format.⁴⁹ In 2017, Morocco hosted a peer review exercise.⁵⁰

A further informal arrangement, labelled 'implementation review', was put forward by Canada, Chile, Ghana, Mexico, and the United States in 2016.⁵¹ This arrangement aimed to voluntarily enhance transparency and to exchange information, experiences and best practices on national implementation of the BWC by mixing elements from both 'compliance assessment' and 'peer review'. The five participating States jointly developed a national reporting form that was to be the basis for information exchange. Completed forms were circulated among participating States for review. This was followed by two-day visits to the capitals of each participating State for in-depth conversations on laws, regulations, and implementation in practice. Facility visits were also part of the programme.

In 2011, the United States emphasized its commitment to building an environment of openness and collaboration in its biodefence activities, and outlined a set of unilateral, voluntary activities for a 'bio-transparency and openness' initiative.⁵² In 2012, the United States reported on these activities.⁵³ Similar initiatives to host visits to maximum containment laboratories and to organize international conferences on BWC topics have also been performed by other States, including Switzerland, Spain, and Chile, to encourage transparency and foster exchanges of views. To focus compliance assessment more specifically on biodefence, military activities and on-site visits, Germany organized what was described as a 'peer review compliance visit exercise' in 2016.⁵⁴ The German Ministry of Defence opened the Bundeswehr Institute of Microbiology in Munich to 20 international experts, with the stated objective to demonstrate that the facility complied with the provisions and obligations of the BWC. The experts were asked to evaluate the information gained during the visit and to develop a compliance assessment report.⁵⁵ The report concluded that the visiting experts had been provided with good insight into the research and diagnostic activities of the Institute, and that the host's cooperation had "helped to promote transparency and confidence with regards to the BWC and reassurance that all activities are within the permitted prophylactic, protective and other peaceful purposes in

⁴⁹ Belgium, Luxembourg and Netherlands. 2016. "Strengthening the BWC: reflecting on the peer review concept". BWC Preparatory Committee. BWC/CONF. VIII/PC/WP.26. 9 August 2016; and Belgium, France, Luxembourg and Netherlands. 2016. "Peer review: an innovative way to strengthen the BWC". BWC Preparatory Committee. BWC/CONF.VIII/PC/WP.13. 4 May 2016.

⁵⁰ Morocco. 2017. "Peer review exercise on the national implementation of the BWC (Morocco 9–11 May 2017)". BWC Meeting of States Parties. BWC/MSP/2017/WP1. 8 November 2017.

⁵¹ Canada, Chile, Ghana, Mexico, and the United States. 2016. "BWC Implementation Review Initiative", BWC/CONF.VIII/WP.22, 8 November 2016.

⁵² US Secretary of State Hillary Rodham Clinton, Remarks at the 7th Biological and Toxin Weapons Convention Review Conference, 7 December 2011. www.state.gov/secretary/20092013clinton/rm/2011/12/178409.htm.

⁵³ United States. 2012. "The United States Government's Bio-transparency and Openness Initiative". BWC/MSP/2012/WP.3, 3 December 2012.

⁵⁴ Germany. 2016. "Confidence in Compliance—Peer review visit exercise at the Bundeswehr Institute of Microbiology in Munich, Germany". BWC/CONF.VIII/WP.11, 21 October 2016.

⁵⁵ Lentzos, Filippa. 2016. "Increasing Transparency in Biodefence: A 2016 Visit to a German Military Medical Biodefence Facility". *EU Non-Proliferation Paper No. 52*. <https://www.sipri.org/sites/default/files/Increasing-transparency-in-biodefence.pdf>.

Article I".⁵⁶ Georgia organized a similar transparency visit in 2018 to the Richard Lugar Center for Public Health Research in Tbilisi. The visiting team concluded that "the facility demonstrated significant transparency about its activities" and that "the visiting team observed nothing that was inconsistent with prophylactic, protective and other peaceful purposes".⁵⁷

These voluntary, plurilateral measures have enabled collectives of States to pioneer new and novel approaches to building confidence in compliance with the BWC, and there is much that can be learned from their experiences. However, such tools are not necessarily useful for building confidence across the range of BWC States Parties or situations the compliance regime may encounter and are limited as tools for the verification of compliance.

⁵⁶ Op. cit. 55, pp.14-15.

⁵⁷ Georgia and Germany, co-sponsored by Austria, Belgium, Columbia, Iraq, Hungary, Malaysia, Mali, the United Kingdom and the United States. 2018. "Building confidence through transparency: Peer review transparency visit at the Richard Lugar Center for Public Health Research of the National Center for Disease Control and Public Health in Tbilisi, Georgia". BWC Meeting of States Parties. BWC/MSP/2018/WP.5. 3 December 2018; Georgia. 2018. "Transparency visit to the Lugar Center, Georgia: An Independent Report". BWC Meeting of States Parties. BWC/MSP/2018/WP.11. 7 December 2018.

5 A POTENTIAL VERIFICATION LAYER

Verification was the focus of biological disarmament efforts between the end of the Cold War and the Fifth Review Conference in 2001.

By the Third Review Conference in 1991, verification had become the single most contentious issue, partly because of concerns about possible Soviet non-compliance, and partly because of growing concerns about Iraq's suspected bioweapons programme.⁵⁸ Some States Parties wanted to press ahead immediately with the development of a verification protocol, while others were less interested. As a compromise, the Third Review Conference agreed to establish an Ad Hoc Group of Governmental Experts—VEREX for short—whose mandate was to identify and examine potential verification measures from a scientific and technical standpoint.⁵⁹

The VEREX group identified and evaluated 21 potential verification measures and divided them into several categories under on-site and off-site measures. The group agreed that no measure, on its own, would be capable of verifying compliance, but that some measures applied in combination did have the capability to do so. The VEREX group concluded that from a scientific and technical viewpoint, "potential verification measures as identified and evaluated could be useful to varying degrees in enhancing confidence, through increased transparency, that States Parties were fulfilling their obligations under the BWC".⁶⁰

A Special Conference of State Parties took place in September 1994 to consider the VEREX report. Despite considerable disagreements on the nature and content of any further work, including divergent views on verification, the Conference reached a 'last minute' agreement to establish an Ad Hoc Group (AHG) with a mandate to consider appropriate measures, including "possible verification measures", and to draft proposals to strengthen the BWC to be included in a legally binding instrument. This was part of a 'package deal' that also included, at the request of several Non-Aligned Movement States, the consideration of specific measures to ensure effective and full implementation of article X on peaceful scientific and technological collaboration among States Parties.⁶¹

As the AHG negotiations proceeded in the second half of the 1990s, a core group of States recognized the potential benefits of a verification component of the protocol and, using the

⁵⁸ Mathews, Robert J. 2004. "The Development of the Australia Group Export Control Lists of Biological Pathogens, Toxins and Dual-Use Equipment". *The CBW Conventions Bulletin* 66: 1-4.

⁵⁹ Duncan, Annabelle, and Robert J. Mathews. 1996. "Development of a Verification Protocol for the Biological Weapons Convention", in Poole, J.B. and R. Guthrie (eds). *Verification 1996: Arms Control, Peacekeeping and the Environment*. pp. 151-170. VERTIC.

⁶⁰ BWC. 1994. "Special Conference of the States Parties to the BWC". BWC/SPCONF/1. 19-30 September 1994. pp. 9-10.

⁶¹ Duncan, Annabelle, and Robert J. Mathews. 1997. "Development of a Verification Protocol for the Biological and Toxin Weapons Convention: Progress in 1996", in Guthrie, Richard (ed.). *Verification 1997: The VERTIC Yearbook*. pp. 106-120. VERTIC.

CWC verification model as a blueprint, were of the view that its effectiveness required the following elements:

- declarations of relevant activities to provide transparency on activities of potential relevance to the BWC, including biodefence, high-containment biological facilities, work with listed agents, and other relevant parts of the biotechnology industry;
- visits to establish routine, non-accusatory inspections at declared facilities to encourage complete and accurate declarations of relevant facilities, to deter violations in declared facilities, and to provide assurance that declarations are accurate;
- facility investigations to enable a short-notice investigation at any facility within the territory of a State Party that another State Party is concerned may be involved in activities in possible violation of the BWC;
- field investigations to allow a State Party to request an investigation if it has concerns that biological weapons have been used against it;
- confidentiality provisions to protect sensitive information to include appropriate safeguards against the possible loss of national security and confidential business information; and
- international cooperation and assistance to facilitate international collaboration and the exchange of scientific and technical information on biotechnology for peaceful purposes, and provide assistance to a State Party under threat of biological attack.

From an early stage, some negotiators saw the word ‘verification’ as a stumbling block to progress. Several States started to use the term ‘compliance monitoring’, rather than verification, because of the view of the United States that verification had a specific meaning based on its use in the context of nuclear arms control.

In the course of the negotiations, a substantial number of States conducted practice visits and facility investigations at various sites, including biodefence, high-containment and vaccine production facilities, in an effort to evaluate and further develop the provisions being developed in the AHG.⁶² However, unlike the situation several years earlier during CWC negotiations, the reporting of these experiences did not result in any observable degree of convergence of views. Specifically, it did not appear to convince States Parties that were opposed to visits to accept them.⁶³

By 1999, several major issues remained unresolved. The AHG’s 310-page procedural report (the BWC Protocol draft text, usually referred to as the ‘rolling text’) reflected a range of divergent positions. Much of the text was footnoted or within square brackets (often multiple sets of square brackets).⁶⁴ The net result was that the rolling text contained, in

⁶² Walker, John R. 1995. “Update: Verification of the Biological and Toxin Weapons Convention and the UK’s Practice Compliance Inspection Programme”, in Poole, J.B. and R. Guthrie (eds). *Verification 1995: Arms Control, Peacekeeping, and the Environment*. pp. 193–6. VERTIC.

⁶³ Author’s personal communication with Robert J. Mathews, March 2011.

⁶⁴ Ad Hoc Group. 1999. “Procedural Report of the Ad Hoc Group of the States Parties to the BWC”. BWC/AD HOC GROUP/49, 13 December 1999.

effect, many alternative packages between the two contrasting alternatives at each end of the spectrum: one set of provisions that were more or less as intrusive as those agreed for the CWC, which many negotiators then considered acceptable for effective verification of the BWC; and another set of provisions, significantly less intrusive than those contained in the CWC, that many negotiators argued would result in a protocol of very limited value, if any, in strengthening compliance with the BWC.⁶⁵

By the end of 2000, negotiation of the rolling text had slowed considerably. To break the deadlock, in March 2001 the Chair, Ambassador Tibor Toth of Hungary, presented a composite text that contained his 'best guess' compromise on a number of outstanding issues.⁶⁶ The composite text received a mixed reception. Some delegations evidently supported the Chair's text as a basis for negotiation, while others sought to return to the rolling text as a basis for further negotiations.⁶⁷

However, these negotiations were shortly to come to an end. At the commencement of the twenty-fourth session of the AHG in July 2001, the United States rejected the composite text, arguing that its arms control model was inappropriate for biological weapons and that the text would undermine the US biodefence programme, the US pharmaceutical industry and national export controls.⁶⁸ The AHG meeting descended into acrimony, ending without agreement, even on a procedural report of its work. Several States that had held minimalist postures in compliance-related discussions on the development of the text used the opportunity to target sole blame on the United States for the failure of negotiations. With this failure, hopes of a verification regime or layer were quashed. The other layers of the compliance regime became de facto substitute verification mechanisms, a role for which they are unsuited, at least without regular review and strengthening in both substance and procedure.

⁶⁵ Mathews, Robert J. 2003. "Efforts to strengthen the Biological Weapons Convention: A Long and Winding Road". *Australian Red Cross IHL Newsletter* 9: 3–4.

⁶⁶ Ad Hoc Group. 2001. "Protocol to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction", BWC/AD HOC GROUP/ CRP.8, 3 April 2001.

⁶⁷ China, Cuba, Islamic Republic of Iran, Indonesia, Libyan Arab Jamahiriya, Pakistan and Sri Lanka. 2001. "Joint Statement on The Process of the BTWC Ad Hoc Group Negotiations". BWC/AD HOC GROUP/WP.451, 4 May 2001.

⁶⁸ Mahley, Donald. 2001. "Statement of the United States to the Ad Hoc Group of Biological Weapons Convention States Parties". 25 July 2001.

6 CONCLUSION:

STEPPING STONES TO STRENGTHENED COMPLIANCE MONITORING

Conflicting views on the verifiability of the BWC have endured through the decades since the treaty was first negotiated and remain a fundamental challenge for biological disarmament and non-proliferation.

Many States support strengthening the BWC on the basis of a legally binding document. Yet it is unclear to some whether a return to the draft verification protocol of the 1990s is the way forward.⁶⁹ Moreover, the draft protocol was a package of measures, only part of which involved verification. That some commentators have argued that the protocol as a package is 'dead' does not necessarily mean that all the constituent parts, including verification, are also 'dead'.⁷⁰ Indeed, as the current intersessional expert meetings on 'institutional strengthening of the Convention' suggest, there is a small but growing appetite among States Parties for meaningful dialogue on how individual States Parties can best enhance transparency and build confidence that States are in compliance with their obligations under the BWC.

As others have noted, one key historical lesson from the BWC is that incremental evolution to implementation is more likely to be agreed, and to achieve tangible improvements to the operation of the treaty, over time.⁷¹ In that vein, it is possible to extract and develop useful components from the draft protocol that could conceivably operate (at least initially) without a legally binding framework and without the institutional support of an organization like the Organization for the Prohibition of Chemical Weapons. A bottom-up approach could result in the development and implementation of individual components on a small scale, their refinement and improvement in operation, gradually expanding participation and scope. Then, once all involved know what is involved and are confident the measures work in practice, these components and practices could be brought together in a legally binding instrument. As long ago as 2003 it was noted:

Some BWC negotiators are optimistic that, in view of the increasing threat of biological weapons proliferation and bioterrorism, that some States Parties which were not fully supportive of multilateral efforts to strengthen the BWC in the 1990s

⁶⁹ United Kingdom. 2019. "Institutional strengthening of the Convention: Reflections on the 2001 Protocol and the verification challenge". BWC/MSP/2019/MX.5/WP.1. 10 July 2019; see also Littlewood, Jeremy. 2018. "Revisiting BWC Verification: A Stepping Stone Approach". *Policy Brief Series to BWC MX5*.

⁷⁰ Lennane, Richard. 2011. "Verification for the BTWC: If Not the Protocol, Then What?". *Disarmament Forum* 1: 39–50. UNIDIR.

⁷¹ Sims, Nicholas A. and Jeremy Littlewood. 2011. "Ambitious Incrementalism—Enhancing BWC Implementation in the Absence of a Verification Protocol". *Nonproliferation Review* 18 (3): 37–41; Littlewood, Jeremy. 2018. "Revisiting BWC Verification: A Stepping Stone Approach". *Policy Brief Series to BWC MX5*.

will change their national positions on strengthening the BWC, initially through effective national implementation of measures agreed at annual meetings, and in due course through a legally binding compliance monitoring instrument.⁷²

The draft BWC Protocol had four complementary components of relevance to verification that already exist: consultation and clarification provisions, declarations, visits, and investigations. Three of these resemble mechanisms that already exist, but that need strengthening:

1. The consultation provisions can be evolved from the consultation procedures agreed in principle at the First Review Conference and elaborated at the Second and Third Review Conferences, and proposals are on the table to develop these further.⁷³
2. The information exchange under declarations can be evolved from the current exchanges under the CBMs, and there seems to be at least some appetite for revisiting the CBMs.⁷⁴
3. The protocol negotiations sought to agree on at least two types of investigations, but since their collapse, any field investigation would likely be undertaken by the United Nations Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM).⁷⁵ Developed in 1989 as an impartial tool of investigation, the UNSGM has never been used for BW incidents, and it is not formally linked to the BWC. However, successive Review Conference Final Declarations reference the UNSGM as an appropriate mechanism for investigating allegations of use. The technical appendices of the mechanism were updated in 2007, and, while it is recognized that considerable logistical, technical and political challenges would likely be faced in efforts to deploy this mechanism,⁷⁶ there are on-going practical initiatives to strengthen the mechanism.

In the longer term, and alongside article V consultations, the CBMs and UNSGM, the compliance measures short of verification described in the third layer could potentially be developed to supplant the final 'visits' component of the Protocol.⁷⁷ Although compliance assessment, peer review, implementation review, and transparency visits are distinct from

⁷² Mathews, Robert J. 2003. "Efforts to strengthen the Biological Weapons Convention: A Long and Winding Road". *Australian Red Cross IHL Newsletter* 9: 3–4.

⁷³ Revill, James. 2018. "Revisiting BWC Verification: Consultations and clarification". *Policy Brief Series to BWC MX5*.

⁷⁴ Lentzos F. 2018. "Revisiting BWC Verification: Information-sharing". *Policy Brief Series to BWC MX5*. See also European Union. 2016. "Position of the European Union relating to the Eighth Review Conference of the BWC". BWC/CONF.VIII/PC/WP.5. 12 April 2016; United States. 2016. "Strengthening confidence-building and consultative mechanisms under the Biological Weapons Convention". BWC/CONF.VIII/PC/WP.6, 10 August 2016; Germany. 2016. "Strengthening confidence-building measures in regard to dual use materials". BWC/CONF.VIII/PC/WP.35. 16 August 2016; Australia, Canada, Japan, Malaysia, Republic of Korea, and Switzerland. 2016. "Step-by-step approach in CBM participation". BWC/CONF.VIII/PC/WP.36. 16 August 2016; Russian Federation. 2016. "Proposal to enhance the format of confidence-building measures under the Biological Weapons Convention". BWC/CONF.VIII/WP.9. 14 October 2016; as well as additional working papers submitted during intersessional meetings 2012–2015.

⁷⁵ Littlewood, Jeremy. 2018. "Revisiting BWC Verification: A Stepping Stone Approach". *Policy Brief Series to BWC MX5*.

⁷⁶ Spiez Laboratory. 2018. "*Spiez Convergence: Report on the third workshop*". 11–14 September 2018; FOI. 2015 "Towards a UNSGM biological analysis network: Workshop report". 16–17 June 2015; FOI. 2016. "UNSGM Biological Analysis Network: Natural, Accidental or Deliberate Outbreak?". 5–6 October 2016.

⁷⁷ Lentzos, F. 2018. "Revisiting BWC Verification Brief 4: Visits". *Policy Brief Series to BWC MX5*.

one another, they all share an overarching objective: to move the compliance debate on in a workable, pragmatic way. In general, the information-sharing initiatives were deemed to add real value to States' compliance judgements by the participating States.⁷⁸ The measures' emphasis on interaction and flexibility, on expert-level exchanges of best practices rather than just on-site monitoring, and on a broad conception of relevant laboratories and facilities, arguably make them even better suited than the Protocol 'visits' to enhancing transparency and building trust today.

Strengthening the BWC regime requires satisfying a range of political and diplomatic constituencies within the treaty's membership. As the BWC Protocol negotiations showed, "nothing is agreed until everything is agreed". Strengthening the BWC will, therefore, require action across all its substantive articles, including article X. Measures to enhance peaceful cooperation and capacity-building among States Parties must also be integral to the way forward.⁷⁹

⁷⁸ Belgium, Canada, Chile, Czech Republic, France, Ghana, Germany, Luxembourg, Mexico, the Netherlands, Spain, Switzerland and the United States. 2016. "Building confidence through voluntary transparency exercises". BWC/CONF.VIII/WP/.35. 10 November 2016.

⁷⁹ Littlewood, Jeremy. 2018. "Revisiting BWC Verification: Peaceful Cooperation". *Policy Brief Series to BWC MX5*.

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