PUGWASH
CONFERENCES ON SCIENCE AND WORLD AFFAIRS
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•THE CHEMICAL WEAPONS CONVENTION•

VISION 2030 AND BEYOND

In 2027, the Chemical Weapons Convention (CWC) will mark the thirtieth anniversary of its entry into force. It prohibits, prevents the proliferation of, and eliminates chemical weapons (CW). Through its near-universal membership, the Organisation for the Prohibition of Chemical Weapons (OPCW) has achieved significant successes, most notably overseeing the verified destruction of declared CW stockpiles and advancing global efforts towards a CW-free world, an effort that earned it the 2013 Nobel Peace Prize.

Notwithstanding those efforts, the CW threat has not disappeared. The OPCW has confirmed CW use on battlefields, in targeted assassinations, and in other types of hybrid operations. Scientific, technological and geopolitical developments are also changing what effective implementation requires. The CWC therefore remains as essential as ever, making its adaptation to new circumstances vital to its continued relevance and effectiveness in the decades ahead. The 30th anniversary and preparations for the 2028 Review Conference offer a chance to assess the challenges ahead and take practical steps to strengthen the CWC.

This Pugwash Briefing Note sets out three areas requiring in-depth analysis for the future of the CWC: (i) the evolving conception of a CW, (ii) the adaptation of the verification regime to scientific and technological developments, including the risks and opportunities of artificial intelligence (AI) for the CWC, and (iii) the implications of these shifts for the Convention's governance over the next decades.

The CWC and the context of toxic-agent use today

Although unstated in the text, the CWC was shaped by the nature of chemical warfare in the First World War and the 1980-1988 Iran-Iraq War, and the CW preparations during the Cold War – a stark contrast to today's asymmetric, opportunistic and targeted use.

Over the past two decades, CW have been employed in various ways. Nerve agents have become a means of assassination. Widely available industrial chemicals, such as chlorine, have reappeared on the battlefield. Unscheduled irritant agents are being used as a method of warfare. In that respect, the lines between law enforcement and warfare have become blurred. Several countries resorted to toxic chemicals, including potent central nervous system (CNS)-acting chemicals, in counter-terrorism operations. The CNS-acting agents and the concept of 'law enforcement' are either ill-defined or not defined in the CWC.

The use of toxic chemicals in hybrid operations (here considered as non-standard confrontations in the grey zone between peace and war, and legality and illegality) poses another challenge for the CWC. Such actions typically avoid triggering a military response, yet they test preparedness, threaten humans, critical infrastructure, industry, agriculture and the environment, and probe red lines through gradual escalation.

Together with lawfare and disinformation campaigns, perpetrators may also seek to paralyse collective decision-making on investigations and accountability, undermining the CWC's procedures for redressing breaches.

The General Purpose Criterion covers these situations, but the OPCW will have to clarify its application and remove any ambiguities or loopholes that may affect its operationalisation.

Challenges for the verification regime

The central question for tomorrow is whether the OPCW can adjust the verification regime to ensure that the CWC remains effective, credible and fit for purpose.

The OPCW must adapt routine verification approaches to reflect changes in chemical production, increasingly complex supply chains and emerging technologies, while preserving the CWC's fundamental principles. Scientific and technological advances, including in analytical chemistry, biotechnology, AI, automation and remote sensing, should be harnessed to strengthen verification and investigative capabilities. These advances also enhance the capacity to investigate non-compliance and alleged CW use. Robust chemical forensics, digital evidence, and data analytics can further support this. Addressing an expanding range of relevant toxic chemicals, including toxins, must also be a priority.

To safeguard OPCW's impartiality, scientific integrity, and institutional credibility, State Parties must enable the secretariat to adapt its technical capabilities, verification process and methodologies, and institutional arrangements.

Governance too is an evolving challenge

Governance relates to how the OPCW is directed, organised, resourced and held accountable, and how its staff and knowledge infrastructure support the implementation of the CWC. In view of fast-changing science and technology developments, financial insecurity, and a splintering international system, how the Organisation develops and maintains relationships with its key stakeholder communities to preserve and strengthen the norm against CW is also crucial. Governance therefore comprises the relationships between the OPCW (as the community of Member States) and the individual State Parties. It concerns the extent to which State Parties are willing to allow the OPCW to adjust to fast-evolving circumstances.

Governance of a multilateral institution has several facets. One of the most important concerns is how authority is distributed and exercised among the OPCW's Member States, the policy-making organs, and the Technical Secretariat led by its Director-General. Charting a path forward includes interpreting the mandate and setting strategic priorities. It will require careful management of the relationship between political direction and day-to-day implementation, involving decision-making and the delegation of responsibilities, all of which require discretion.

The top priority remains preventing the reemergence of CW, regardless of the changing context. To adjust to new circumstances, the OPCW should avoid pursuing structural and fiscal optimisation without a clear strategic course.

Maintaining or enhancing institutional relevance rather than defaulting to organisational survival in the face of emerging challenges must take precedence.

A clear strategic direction provides justification and responsibility for maintaining and renewing the workforce. The OPCW must prepare contingencies for variable patterns and circumstances of CW use.

Translating the new strategic priorities into sustainable operational capacity implies budget choices and funding arrangements. State Parties must not only buy into the emerging strategic direction, but also adopt budgets that match the new priorities and make every effort to reduce the OPCW's financial vulnerabilities.

In closing

The OPCW can look back on three decades of cooperative security and disarmament success. Nevertheless, the CWC requires a meaningful upgrade to face the grave challenges of maintaining State Parties' confidence in treaty compliance and containing new modes of toxic-agent use for hostile purposes. Addressing the threat of using toxic substances for new objectives, adapting verification and investigative capacities to new technologies and contexts, and charting a new course are among the adjustments that will retain or enhance the OPCW's relevance in the coming decades.

The Pugwash CBW Working Group will continue to develop this ***Vision 2030 and Beyond*** ahead of the Sixth Review Conference and welcomes the views of experts and practitioners.

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The Pugwash CBW Programme

Objectives

The Pugwash CBW Programme studies CBW-relevant issues in line with a rolling, multi-year research plan. Concrete outputs include publications, policy papers, conference presentations, and statements and side events at BTWC and CWC meetings of State Parties. The CBW Working Group guides/steers the programme work. It draws on the expertise of the Pugwash membership and on input from external scientists, academics, professionals, and representatives of relevant institutions, stakeholder communities, and civil society. Among its activities are virtual outreach meetings open to a broader public, collaborations with International Student/Young Pugwash to foster intergenerational synergies and engage young scientists and professionals, and annual workshops in support of the BTWC and CWC.

Output and Impact

In the medium term, the work of the CBW Programme will provide governments, diplomats, and policymakers with a deeper understanding of the key challenges and threats to the CWC and BTWC regimes and help to develop greater awareness and anticipation of emerging CBW risks. Longer-term Pugwash work will strengthen CWC and BTWC norms and compliance at a time when international cooperation is weakening. Overall, we seek to contribute to reducing the risks of the development, production, proliferation, and use of chemical and biological weapons across different security contexts.

Background

The Pugwash Conferences on Science and World Affairs is an international non-governmental organisation established in 1957 in response to the call in the Russell-Einstein Manifesto of 9 July 1955 for an international conference of scientists to consider the dangers of nuclear weapons. Through the decades, it has established a long-standing tradition of 'dialogue across divides', for which it was awarded the Nobel Peace Prize in 1995. By facilitating track 1.5 and track 2 dialogues, the Pugwash movement fosters creative discussions on ways to enhance the security of all parties and promote cooperative, forward-looking policy development.

The 1958 Pugwash Conference took up the matter of biological and chemical weapons and their utility relative to nuclear weapons. It resulted in the establishment of a study group, which met for the first time in January 1965. Its initial focus was on a possible inspection system for biological warfare preparation. This study group contributed to the UN Secretary-General's 1969 report on CBW and the 1970 WHO report on the Health Aspects of Chemical and Biological Weapons.

Over the decades, the study group went through several iterations. Its members have contributed significantly to the BTWC and CWC negotiations and to the implementation of both treaties since their entry into force in 1975 and 1997, respectively. Between the early 1990s and early 2010s, it organised annual workshops in Geneva and The Hague, contributing to the strengthening of the norm against CBW and the development of the respective treaty regimes.