

## Preventing Weaponisation of CNS-acting Chemicals - A Holistic Arms Control Analysis

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### Summary

This article examines the legacy of the 1995 Tokyo Subway Sarin Attack and its role in accelerating global chemical disarmament through the CWC. It highlights ongoing risks from non-signatories and chemical misuse, stressing the need for stronger international enforcement and innovative tools like AI to address evolving threats.

For many years, Michael Crowley and Malcolm Dando have been at the forefront of efforts to apprise scholars, policymakers, and the broader public about the significance of central nervous system (CNS) acting agents in the context of arms control.

In November 2025, Michael Crowley and Malcolm Dando published a fascinating book titled 'Preventing Weaponization of CNS-acting Chemicals: A Holistic Arms Control Analysis', in which they examine the risks associated with the weaponisation of CNS-acting chemicals and propose a comprehensive Holistic Arms Control framework to address emerging challenges in this domain. Their work has examined the nature of these agents, their potential applications, and the historical circumstances surrounding their development and use. In this book, the authors have developed a Holistic Arms Control (HAC) analytical framework that integrates two interconnected dimensions: the past and potential future development of CNS-acting agents and the international legal and regulatory structures designed to govern them.

The evolution of CNS-acting agents provides a compelling case study of the convergence of chemistry, life sciences, neuroscience, and related disciplines. Such convergence creates new synergies and capabilities that may extend far beyond current expectations. Given the accelerating pace of scientific and technological innovation, developments in this area remind us to expect the unexpected, not only with regard to the CNS-acting agents but also in relation to emerging forms of weaponisation more broadly.

The book guides readers through three distinct stages. In the first stage, it explores historical programmes that are often unsettling in their implications. Some states pursued agents intended to incapacitate individuals physically and psychologically, while others sought compounds capable of disrupting or damaging the nervous system. The substances examined include several well-known categories, such as cannabinoids, psychedelics, opioids, benzodiazepines, and neuroleptic anaesthetic agents, among others. Some of these substances have been used operationally, others were developed and weaponised, and, fortunately, the most alarming possibilities remain largely theoretical.

The second stage offers a detailed examination of the international legal framework relevant to the control of CNS-acting agents. The discussion encompasses the most directly applicable instruments, including the Biological and Toxin Weapons Convention (BTWC) and the Chemical Weapons Convention (CWC), as well as broader legal regimes such as International Human Rights Law, International Humanitarian Law, and the United Nations Drug Control Conventions. Importantly, the authors also highlight a frequently overlooked component of governance: the scientific and medical community. Its role in regulating dual-use research, promoting professional codes of ethics, and advancing education and outreach is essential to preventing misuse.

The third stage presents a strategy for strengthening existing regulatory mechanisms while identifying opportunities for developing new ones. It is here that the Holistic Arms Control framework fully takes shape, demonstrating its value and relevance for the contemporary arms control community. The authors make a persuasive

case that complex security challenges require regulatory approaches that transcend the boundaries of individual treaties and institutions.

Beyond their specific recommendations for enhancing the control of CNS-acting agents, the authors summarise their broader approach as follows:

“The HAC analytical framework seeks to actively explore the utility of employing a multiplicity of mechanisms and to facilitate the active engagement of a variety of relevant actors in the regulation of the weapons or weapons-related technology under review. Consequently, it is an axiomatic principle of HAC that several regulatory processes elaborated as part of existing regimes (as well as those independent of such regimes) can be pursued in parallel.”

The regulation of CNS-acting agents is inherently complex. This complexity stems from the nature of the agents themselves, the diversity of scientific and technological fields involved in their development, the rapid pace of innovation, and the persistent tendency of regulatory frameworks to lag behind technological advances.

Taken together, these factors demonstrate why a holistic approach is particularly valuable. Such an approach allows policymakers and analysts to examine both the technical characteristics of a weapon and the broader political, legal, scientific, and societal contexts in which it emerges. It also provides a dynamic perspective that can adapt as both technological capabilities and regulatory frameworks evolve.

This book is an essential reading for anyone interested in the development and governance of CNS-acting agents, chemical and biological security, neuroscience, dual-use research, and the broader challenges posed by emerging technologies and their potential misuse.