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## The BWC in Today's Multipolar World

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### ABSTRACT

People often point to the Biological Weapons Convention (BWC) as a massive success for international disarmament. The reality, however, is that the BWC's framework is practically hollow. This is a major problem right now because international relations have become so complicated. We're living in a world that is somehow unipolar, multipolar, and chaotic all at once, and the balance of power keeps shifting across different domains. This article shows a structural realist Critique of the convention within the context of an emerging chaotic multipolar world Order. As dual-use biotechnology becomes cheaper and easier to conceal since great power rivalries intensified, the lack of a hard verification mechanism becomes a major strategic liability for the treaty. And in an anarchic international system, states operate on a baseline of mistrust, creating a classic security dilemma because the states cannot independently verify the biological research of rival nations. Thus, fear and uncertainty make clandestine defection a rational strategy for survival.

The paper also argues that without a single hegemon who is willing to enforce a rigorous inspection regime in order to deter cheating, the notion of collective security in the biological sector remains a dangerous illusion. By analysing the different sections of cutting-edge technology in life science and shifting geopolitical alignment, the study elucidates how technological opacity worsens the classic security dilemma and how institutions and multilateral agreements cannot override the basic logic of power politics. When push comes to shove, states will discard toothless treaties and rely strictly on their own unilateral defence.

## 1. INTRODUCTION

The Biological and Toxin Weapons Convention (BWC) of 1972, which has been ratified or acceded to by 189 states or parties as of 2026, bans the development, acquisition, possession and use of biological and toxin agents "of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes." It was the first multilateral disarmament treaty to explicitly ban an entire category of weapons of mass destruction; thus, the signing of the BWC in 1972 marked a unique moment in the history of the Cold War. For decades, the liberal institutionalists have presented the BWC as conclusive evidence that states can overcome the security dilemma through diplomatic cooperation and international law. The dominant view suggests that the norm against biological warfare, which is reinforced by the treaty's institutional structure, was successful in removing biological weapons from the strategic considerations of major powers [1]. However, from the lens of structural realism, the truth feels far more ominous. Structural realists like Kenneth Waltz and John Mearsheimer argue that the BWC was a product of strategic calculation during that

specific period of bipolar détente between the US and the USSR, and it was not a victory of shared morals. According to them, the United States and the Soviet Union agreed to the ban largely because at that time biological weapons were considered strategically volatile and tactically unessential compared to their massive nuclear arsenals. The biggest flaw of the BWC is that it has no mechanism to enforce its own rules. When diplomats negotiated the treaty in the 1970s, they didn't think verification was necessary. Biological weapons weren't viewed as militarily useful back then, and intrusive inspections were a political non-starter. But the world looks very different now [2]. We have moved from a rigid bipolar order to a messy, competitive multipolar one. More importantly, biotech has advanced at breakneck speed. Thanks to CRISPR, synthetic biology, and modern bioinformatics, the nature of the threat has completely changed. The BWC is stuck in the past, trying to regulate a landscape where potentially dangerous biological research is decentralised, affordable, and incredibly hard to trace.

## 2. HISTORICAL CONTEXT

Despite contemporary anxieties regarding high-tech bioweapons, the weaponisation of disease has historical precedents. Throughout history, biological warfare has taken crude but brutal forms, such as catapulting diseased corpses over castle walls, throwing venomous snakes onto enemy ships, or driving sick livestock into water supplies to contaminate them. This tactical use of infection persisted into modern conflicts; during the Vietnam War, Vietcong fighters deployed “punji sticks” smeared with biological waste to induce severe infections in enemy combatants, recognising that the resulting illness would cause far more incapacitation than the physical wound itself. Naturally occurring epidemics provide the clearest illustration of a modern biological weapon's potential devastation [3]. The bubonic plague decimated approximately one-third of Europe's population in the 1300s, wiping out entire communities. Similarly, at the conclusion of World War I, a novel influenza strain emerged and spread rapidly as soldiers returned home to a war-torn Europe. The 1918 flu pandemic claimed between 600,000 and 700,000 American lives, nearly matching the casualties of the entire American Civil War. The societal collapse was profound: graves could not be dug fast enough, waste accumulated in streets, and the decimation of essential workers left vulnerable populations to starve [4]. These historical traumas resonate deeply in the wake of the COVID-19 pandemic, which similarly overwhelmed hospitals, triggered supply shortages, and exposed the fragility of modern societal infrastructure. This recent experience underscores the chilling threat posed by biological weapons. If a natural virus can inflict such profound global disruption, an engineered pathogen released intentionally against an unprepared population would yield catastrophic physical and societal devastation. Agreements like the BWC exist precisely to prevent this chaos, as the critical distinction between a pandemic and a bioweapon lies in human intent [5-7].

## 3. LITERATURE REVIEW

The debate regarding the efficacy of arms control underscores the theoretical divide between liberal institutionalism and structural realism.

**3.1. Liberal Institutionalists:** Scholars such as Robert Keohane assert that international organisations and treaties mitigate the effects of global anarchy by lowering transaction costs, facilitating dispute resolution, and establishing norms that shape state behaviour. Regarding the BWC, institutionalists and constructivists emphasise the “biological taboo,” arguing that the treaty has thoroughly stigmatised disease as a weapon, making offensive biological programs politically unacceptable. From this perspective, the lack of formal verification is a weakness, but not fatal; confidence-building measures, voluntary data exchanges, and transparency initiatives can foster sufficient trust. Compliance is ostensibly driven by reputation, as violating the BWC would provoke severe diplomatic isolation [8-9].

**3.2. Structural Realists:** Conversely, scholars like Kenneth Waltz and John Mearsheimer reject this institutionalist optimism, arguing that the international system is defined entirely by anarchy and the absence of a global sovereign. In this self-help system, state survival remains paramount. Because states can never be certain of others' intentions, they are perpetually concerned with the balance of power. Mearsheimer's offensive realism posits that rational states constantly seek opportunities to maximise their relative power to ensure security [10]. Thus, institutions like the BWC merely reflect power politics and exert no independent constraint on state behaviour; states will comply when it aligns with their strategic interests and defect when survival demands it. Realism dictates that arms control is only effective when accompanied by rigorous

verification and enforced by a dominant power, both of which the BWC lacks. Furthermore, Robert Jervis's concept of the security dilemma highlights the inherent instability of biological research. Because most biotechnology is "dual-use", meaning vaccine development utilises the same mechanisms as pathogen engineering, defensive preparations are fundamentally indistinguishable from offensive ones [12-13].

**3.3. Synthesis:** While institutionalists focus on the BWC's normative successes, they fail to address how structural incentives shift under multipolarity. Realism effectively diagnoses the fragility of unverifiable treaties, yet traditionally focuses heavily on nuclear deterrence. Bridging this gap requires analysing modern dual-use biotechnology through a structural realist lens [14].

## 4. Methodology

This paper employs a qualitative case study methodology to analyse state behaviour under the constraints of the BWC and to identify how the security dilemma drives decision-making regarding biological technology. Because biological weapons programs are inherently classified and deliberately obscured, quantitative compliance data is unreliable due to the treaty's lack of verification mechanisms. Therefore, tracing the strategic behaviour of major powers offers the most accurate assessment of the BWC's efficacy.

The study examines two primary cases:

**4.1. The Soviet Union's Biopreparat Program:** A historical case highlighting the BWC's failure during the bipolar era and illustrating the rational calculus behind clandestine defection.

**4.2. Contemporary Dual-Use Biotechnology:** An analysis of modern state behaviour under multipolarity, focusing on the strategic ambiguity of biodefense programs amidst rapid technological advancement.

These cases represent the most profound manifestations of the security dilemma in the biological domain, demonstrating that structural constraints consistently override institutional commitments regardless of the era.

## 5. EMPIRICAL CASE STUDIES

### 5.1. The Soviet Union and Biopreparat

The Soviet Union operated a massive, covert biological weapons program beneath a state-sponsored umbrella organisation known as Biopreparat. The scale of this operation was exposed following the defections of high-ranking insiders Vladimir Pasechnik and Kanatjan Alibekov, who confirmed that the Soviet military had mass-produced virulent strains of smallpox. This clandestine research originated after World War I, formalised into a modern weapons program in 1971 with the establishment of Biopreparat, and continued unabated through the negotiation, signing, and implementation of the BWC. The Soviets developed aerosolised pathogens, including anthrax and smallpox, continuing weaponisation even after the World Health Organisation declared the natural eradication of smallpox. By the time global vaccination ceased, the Soviet Union held an exclusive stockpile of the lethal agent. In 1993, Pasechnik estimated that a targeted deployment could kill half of a 100,000-person city within days.

While institutionalists view this as a failure of norms, a structural realist perspective views Biopreparat as a highly rational and predictable response to the Cold War security environment. Operating under systemic paranoia, Soviet leadership fundamentally distrusted the United States. Despite President Richard Nixon's unilateral dismantling of the U.S. biological program in 1969, Soviet intelligence assumed it was a strategic deception. Unable to verify American disarmament, and dictated by the realist mandate to base strategy on a rival's capabilities rather than stated intentions, the Soviets concluded that strict adherence to the BWC would leave them vulnerable. The treaty's lack of verification actually facilitated this defection, offering low risks of exposure against the high perceived strategic value of a biological deterrent. Involving tens of thousands of scientists, Biopreparat engineered pathogens to resist antibiotics under the guise of civilian pharmaceutical research. This case illustrates the core realist tenet, when survival is perceived to be threatened, states will subvert international treaties, utilising institutional frameworks as a false sense of security while manipulating the balance of power in secret [15-16].

### 5.2. Contemporary Multipolarity and Dual-Use Tech:

In today's geopolitical landscape, harnessing dual-use technology innovations like drones and AI with both civilian and military applications is vital for national security. The modern battlefield is heavily shaped by

commercial innovations that are rapidly adapted for defence, such as the deployment of SpaceX's Starlink for military communications in Ukraine, or the modification of commercial agricultural drones for combat reconnaissance [17]. If the BWC failed to constrain behaviour during the relative stability of bipolarity, it is woefully inadequate for the current multipolar era, where power is diffused among the U.S., China, Russia, and emerging regional actors. This multipolarity multiplies the adversaries a state must monitor, compounding fear and uncertainty. Furthermore, technological barriers have plummeted; unlike Biopreparat's massive industrial infrastructure, modern synthetic biology enables genetic manipulation in small, inconspicuous labs. The core crisis of the modern BWC lies in this dual-use nature. Tools used to develop agricultural resilience or mRNA vaccines can easily be repurposed to enhance a pathogen's lethality or transmissibility [18-19]. Driven by intense economic and military competition, states are aggressively expanding national biodefense programs, establishing high-containment laboratories under the legally permitted guise of public health. Structurally, robust biodefense is indistinguishable from the foundational stages of offensive weaponisation, as developing countermeasures requires first synthesising the targeted pathogen. This dynamic triggers a classic arms race spiral [6]. When State A builds a new BSL-4 facility for defensive research, State B, unable to verify intentions, must assume offensive preparations. State B expands its own program to ensure survival, prompting further escalation from State A, all within the legal ambiguities of the BWC. Ultimately, the treaty provides diplomatic cover for states to acquire baseline capabilities with plausible deniability [20].

## 6. THEORETICAL ANALYSIS

Both the historical Biopreparat case and contemporary biotechnology advancements substantiate a structural realist interpretation of international relations. The failures of the BWC stem from the fundamental structure of the international system, not diplomatic miscommunications or a lack of global norms. Realism posits that international agreements only hold weight when enforced by a hegemon. While nuclear treaties like the NPT are heavily monitored by the IAEA and backed by dominant powers, the biological domain lacks an equivalent enforcement mechanism. Attempts to negotiate a legally binding BWC verification protocol collapsed in 2001 because major powers refused intrusive inspections that might compromise proprietary commercial and military secrets. In an anarchic world, relying on an honour system is a profound strategic liability. Furthermore, biotechnology alters the offence-defence balance [7]. Historically, biological weapons were tactically unpredictable, risking blowback on the user's own troops. Today, advancements in targeted gene editing theoretically enable the creation of highly precise pathogens. By making biological agents cheaper, more precise, and highly deniable, technology shifts the balance to favour the offence, increasing the incentive to defect from the BWC. In a multipolar struggle for regional dominance, a deniable biological attack such as an agricultural pathogen deployed to cripple a rival economy offers immense strategic rewards with an almost zero risk of attribution or retaliation.

## 7. CONCLUSION

The Biological Weapons Convention exemplifies the fatal flaw of liberal institutionalism: the naïve assumption that legal frameworks can supplant the balance of power. Analysed through a structural realist lens, it becomes evident that the BWC is a hollow institution. It provides the illusion of collective security without altering the fundamental anarchic incentives that drive state behaviour. The Soviet Union's Biopreparat program demonstrated that states will exploit unverifiable treaties to secretly build offensive capabilities when they perceive existential threats to their survival. In today's highly competitive multipolar system, the situation is even more precarious. The revolution in dual-use biotechnology has lowered barriers to entry while blurring the lines between defensive and offensive research, locking states into a biological security dilemma. Driven by mistrust and the imperative of self-help, the expansion of biodefense capabilities inevitably mimics offensive preparation, accelerating a silent, legal arms race. Ultimately, institutions cannot transcend global anarchy. Treaties lacking enforcement mechanisms will be discarded whenever vital state interests are on the line. Policymakers must abandon the illusion that global norms alone will prevent the militarisation of biotechnology. Instead, stability in the biological domain will only be achieved through classic realist mechanics: robust deterrence, unilateral intelligence gathering, and an overwhelming defensive posture designed to deny any adversary a strategic advantage.



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