

The Altered Nuclear Order in the Wake of the Russia-Ukraine War



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Wilfred Wan, and Doreen Horschig

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The aftermath of war: an illustration of the destruction from the war in Ukraine, showing the consequences of artillery shells and air strikes on a military base; March 27, 2022; iStock.com/Diy13.

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Executive Summary

On February 24, 2022, Russia invaded nonnuclear-armed Ukraine and leveraged threats with its nuclear arsenal as a “shield” to deter third-party intervention. The well-publicized horrors on the ground in Ukraine are, unfortunately, not the only consequences of Russia’s full-scale invasion of its neighbor. The war is having unmistakable effects on how governments, scholars, and the public think about nuclear arms. Not only has Moscow reintroduced the world to the often-unsavory realities of nuclear deterrence, but its suspension of the New Strategic Arms Reduction Treaty (START) and deratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) have been setbacks for arms control and disarmament. Meanwhile, vulnerable states around the globe may be further incentivized to develop nuclear weapons or seek protection from nuclear-armed patrons to avoid being invaded like Ukraine.

Given these changing geopolitical circumstances, how might the Russian war on Ukraine affect the global nuclear order? The authors in this publication conclude that the United States and the broader international community must now more seriously engage with alternatives to traditional arms control, nonproliferation, and disarmament endeavors. Specifically, the authors discuss the increasing prominence of approaches such as the Treaty on the Prohibition of Nuclear Weapons (TPNW)—popularly known as the Nuclear Ban—and risk reduction measures. They assess whether these initiatives can have an impact in reducing nuclear dangers. Additionally, they examine temptations for states to pursue more forceful counterproliferation measures and describe the risks of doing so.

This publication proceeds in three sections as it unpacks challenges to the global nuclear order presented by Russia’s war. First, Rebecca Davis Gibbons (University of Southern Maine) and Stephen Herzog (Center for Security Studies at ETH Zurich) explore how prospects for the success and failure of the TPNW have been altered by the shifting nuclear landscape. Next, Wilfred Wan (Stockholm International Peace Research Institute) analyzes risk reduction measures in light of growing nuclear modernization and arms control backsliding, highlighting how this approach can involve multiple players and address technological hurdles. Finally, Doreen Horschig (Center for Strategic and International Studies) discusses a possible turn to counterproliferation, as instruments of the nonproliferation regime may falter, and outlines the risk of resorting to the use of force against nuclear weapons programs.

“Nuclear Disarmament and Russia’s War on Ukraine: The Ascendance and Uncertain Future of the Treaty on the Prohibition of Nuclear Weapons” by Rebecca Davis Gibbons and Stephen Herzog

In their essay, Rebecca Davis Gibbons and Stephen Herzog assess how the nuclear dynamics of Russia’s war on Ukraine have impacted the TPNW’s efforts to eliminate nuclear weapons. The authors evaluate predictions from scholarly literature, evolving state positions, implications for public opinion, and how actual nuclear weapon use may alter the international climate. They conclude that the war has exacerbated a schism between those who advocate for nuclear disarmament and those who favor nuclear deterrence. They also conclude that great-power competition between the United States, China, and Russia undermines the notion of traditional phased U.S.-Russia arms control as a driver of nuclear disarmament.

Many observers have argued that the war in Ukraine incentivizes nuclear proliferation among nonnuclear states. Yet, of the more than thirty states that initiated nuclear weapons programs, just ten acquired the bomb. Gibbons and Herzog highlight several reasons from the social scientific literature explaining why this is the case: the role of alliances with nuclear-armed states, U.S. efforts to prevent nuclear proliferation, managerial challenges of building nuclear weapons, and strong norms against nuclear weapons development and use.

Among states, the authors note that two nuclear narratives are prominent from Russia’s war on Ukraine: nuclear disarmament and nuclear deterrence. The first addresses the dangers presented by wars involving nuclear-armed states and champions disarmament and the TPNW. The second recognizes these dangers but concludes that the way to achieve security is increased reliance on nuclear deterrence and extended deterrence, not the TPNW. The result is much greater polarization in international nuclear politics, particularly in multilateral fora.

Gibbons and Herzog argue that these divisions may also affect publics, the key audience for many Nuclear Ban outreach efforts. Most publics around the world have not confronted such vivid nuclear risks since the Cold War. While attitudes in nuclear-armed states and their allies appear to be turning toward deterrence and away from disarmament, the authors argue it is still too early to conclude how this war will shape views toward the bomb worldwide.

One scenario that will likely have considerable effects would be the use of nuclear weapons by Russia in its war on Ukraine. The literature suggests that if nuclear weapon use is strategically effective and carries limited collateral damage, this could lead some governments and publics to more

readily accept the nuclear deterrence narrative. But if nuclear use does not contribute to a Russian victory and/or results in mass casualties, the appeal of nuclear weapons should plummet. This would buttress the disarmament narrative. Overall, how the war ends, and what role nuclear weapons do, or do not, play in the outcome, will have long-standing implications for the global nuclear order.

Regardless, the authors conclude that disarmament is now the dominant alternative to the nuclear status quo, and the TPNW is the principal tool in promoting it. As the authors point out, the global nuclear order has so far withstood Russian transgressions, but its inequities have become increasingly visible. These are the injustices that, in part, motivated the creation of the TPNW, which is proving its staying power. Continuing to ignore the treaty could risk the great powers' credibility on nonproliferation and disarmament, their relationships with the Global South, and the continuity of their military alliances. It is therefore in the interests of the United States and its allies to acknowledge the concerns of Nuclear Ban proponents and begin finding ways to address them.

“Wither Nuclear Risk Reduction?” by Wilfred Wan

In his essay, Wilfred Wan assesses the state of nuclear risk reduction. In doing so, he outlines risk reduction concepts and operational challenges, reflects on past efforts during and after the Cold War, examines risk reduction in light of the Russia-Ukraine War, and highlights recommendations for revitalizing it going forward. He emphasizes that reducing the probability of nuclear use will require political, strategic, operational, and technical steps at national, bilateral, and multilateral levels.

Nuclear modernization programs, including those involving states outside the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), have enhanced the role of nuclear weapons. In this context, Wan argues that risk reduction is crucial in preventing miscalculation and accidental detonation during crises among adversarial states, and it can also improve the safety and security of existing stockpiles and materials. He outlines risk reduction efforts by the Soviet Union and the United States during the Cold War, which centered on 1) mutual recognition of an unacceptable level of risk; 2) transparency, information exchange, and behavioral restraint; 3) restrictions in capabilities; and 4) strategic dialogue.

Wan notes that when Russia invaded Ukraine on February 24, 2022, the risk calculus of some states changed, impacting their views on the utility of nuclear weapons. While the war's long-term impact on the global nuclear order is to be determined, the specter of nuclear escalation between Russia and the West linked to that war remains.

Wan also points out the subjectivity of risk assessments and the variability of risk thresholds, which can present obstacles to multilateral risk reduction efforts. He notes the difficulty of creating consensus-based policies through bilateral and multilateral risk reduction efforts, but argues that Russian involvement will eventually be necessary, as Russia has the largest nuclear weapons stockpile. Although Russia and the United States have engaged in some limited confidence-building measures even during the war in Ukraine, Wan highlights a resultant backsliding in transparency, information exchange, and behavioral restraint. This is especially concerning since the only agreement in place with limits on the size and composition of Russian and U.S. nuclear arsenals, New START, is suspended and set to expire in 2026.

To revitalize nuclear risk reduction efforts, Wan recommends the following:

- *Expand the approach* to be multifaceted and multidomain, including by enhancing broader military transparency.
- *Address technological concerns*, including advances in nonnuclear capabilities that can contribute to greater asymmetries and undermine nuclear deterrence.
- *Ensure inclusive dialogue* by expanding the pool of actors in risk reduction efforts, including by engaging the private sector and industry.
- *Intensify engagement with China* to rebuild trust and develop normative frameworks around confidence-building security measures.
- *Strengthen regional perspectives* by utilizing existing frameworks and institutions to address destabilizing local factors, escalatory dynamics, and nuclear risks.
- *Identify benchmarks* that can further the operationalization of risk reduction and lay out clear goals and timelines for implementing measures.

Wan suggests that policymakers and experts need to see risk reduction as a priority. He asserts that risk reduction should be more untethered from notions of strategic stability and deterrence as these Cold War-era concepts no longer fully reflect the conditions of the current nuclear landscape. In the short term, he suggests that states work toward risk reduction unilaterally and in small groups of like-minded states. Some practical actions that these states may undertake include coordinating on risk assessments and implementing effective signaling to prevent external misperceptions

and inadvertent escalation. Wan concludes by suggesting that cross-cutting discussions and confidence building efforts can make strengthening risk reduction possible.

“A Turn to Nuclear Counterproliferation: Consequences of a Deteriorating Nonproliferation Regime” by Doreen Horschig

In her essay, Doreen Horschig highlights the growing precarity of the global nuclear order amid the war in Ukraine and as concerns arise about non-nuclear states—particularly Iran, Japan, South Korea, and Saudi Arabia—acquiring nuclear weapons. She analyzes the traditional tools to prevent nuclear proliferation and explains that treaties, export controls, safeguards, extended deterrence, and economic sanctions have not always prevented states from pursuing independent nuclear weapons programs.

Given the limitations of the nonproliferation regime and current doubt about the effectiveness of negotiations, Horschig explores whether states resort to counterproliferation as an alternative to traditional nonproliferation. Counterproliferation strategies, she explains, tend to supplement nonproliferation efforts in disincentivizing the creation of nuclear programs and the use of nuclear weapons—particularly in East Asia, the Middle East, and in the Russia-Ukraine War. Such operations include the state-sanctioned use of force against nuclear materials, commodities, personnel, or infrastructure via military strikes, cyberstrikes, electronic warfare, assassinations, or sabotage.

Horschig highlights several empirical examples that warrant close attention and provides quantitative evidence for a novel trend of increased counterproliferation activity that is in its infancy. She argues that if the war in Ukraine causes an increase in calls for nuclear proliferation, counterproliferation incentives will grow alike, prompting an increased risk of escalation between actors due to the operations’ illegal nature and violation of sovereign rights.

Horschig highlights the need for an effective nonproliferation regime to counter nuclear escalation, promote transparency, and encourage trust internationally. She advises practitioners to continue implementing and strengthening traditional nonproliferation commitments but also to explore novel arms control approaches that address new technologies and manage multifaceted security risks. The United States, she suggests, should continue to strengthen extended deterrence assurances with Japan, South Korea, and its other allies.

Horschig’s essay underscores the urgency to prioritize the strengthening of the nonproliferation regime to prevent states from considering military operations or other counterproliferation strategies. She concludes

by emphasizing that productive arms control negotiations are possible despite a shifting geopolitical landscape and technological advances. She stresses the necessity of negotiations, highlighting the potential calamitous consequences of neglecting efforts to work diplomatically toward nuclear nonproliferation.

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Nuclear Disarmament and Russia's War on Ukraine: The Ascendance and Uncertain Future of the Treaty on the Prohibition of Nuclear Weapons

Rebecca Davis Gibbons and Stephen Herzog

Introduction

The dangers of nuclear weapons have recaptured the global imagination. When Russian President Vladimir Putin launched his full-scale invasion of Ukraine in February 2022, he alluded to potential nuclear strikes against would-be intervenors.¹ Putin threatened anyone who opposed Russian actions with consequences “never seen in your history.”² Moscow has followed up with dozens of nuclear signals during the conflict—both threats and escalatory actions.³ The North Atlantic Treaty Organization (NATO) has supplied Ukraine with weapons but so far has avoided direct involvement in the conflict. Meanwhile, relentless media coverage of nuclear risks has reacquainted the global public with the dilemmas of the atomic age.⁴ The world's most powerful weapons are now front and center in international politics, affecting everything from nuclear counterproliferation prospects to risk reduction initiatives.⁵

Yet, just one year before Russia attacked Ukraine, a new multilateral nuclear disarmament treaty entered into force. The Treaty on the Prohibition of Nuclear Weapons (TPNW), popularly known as the Nuclear Ban, achieved this legal standing after its ratification by fifty states. The agreement prohibits nuclear weapons and all related production and military activities, thereby posing a challenge to existing military doctrines of nuclear deterrence.⁶ Among the explicitly outlawed activities are nuclear threats like those issued by the Kremlin. But the TPNW carries the weight of international law only for its sixty-nine states parties.⁷ All nuclear-armed countries, as well as those relying on extended nuclear deterrence, have rejected the treaty and argue that they are not bound by its provisions.⁸

This lack of support from states that depend on nuclear weapons has done little to dampen the enthusiasm of Nuclear Ban proponents. In June

2022, TPNW members, observer states, and antinuclear activists held the treaty's First Meeting of States Parties in Vienna, Austria. They took action on various aspects of treaty implementation, including steps to develop verification protocols and fulfill the accord's positive obligations of victim assistance and environmental remediation.⁹ The Vienna meeting ended with the adoption of a forward-looking declaration by the states parties. It commits the TPNW membership to "harness the public conscience in support of our goal of universal adherence to the Treaty and its full implementation."¹⁰

For many states and members of the public, the war in Ukraine has emphasized a growing imperative for nuclear disarmament. The risks of nuclear confrontation between Russia and NATO have received considerable media and public attention. Additionally, the Kremlin's use of nuclear threats to enable its invasion of a sovereign state may herald an unsettling new revisionist era of nuclear politics. It is not difficult to interpret these dynamics as an unambiguous reminder of the dangers of living in a world where nine states possess some 12,500 nuclear weapons.¹¹ Disarmament sentiments accordingly surrounded the May 2023 Group of 7 Summit in Hiroshima, Japan, where the legacy of the atomic bomb looms large.

Some governments seem to have drawn the exact opposite lesson, however. Finland and Sweden responded to the war by moving away from their long-standing neutrality and seeking to join NATO—an explicitly nuclear alliance.¹² In Seoul, policymakers drew parallels between the North Korean threat and Russia's invasion of Ukraine.¹³ South Korean President Yoon Suk Yeol even briefly advocated for indigenous proliferation, leading to increased nuclear deterrence coordination with the United States.¹⁴ To leaders from many countries facing powerful adversaries and threats to their national survival, the lesson of the Ukraine war is to rely more, not less, on nuclear deterrence.

Given these trends, we provide an assessment of how Russia's war on Ukraine may affect the prospects of the TPNW. Our analysis covers relevant predictions from the scholarly literature, the current trajectory of state positions on nuclear arms, implications for public opinion, and a discussion of how the use of nuclear weapons may change the international climate. We reach two central conclusions about the Nuclear Ban's approach to nuclear disarmament. Both have wide-ranging implications for the future of the global nuclear order.

First, the nuclear overtones of the war in Ukraine have increasingly polarized backers of the policies of disarmament and deterrence. Likewise, the public debate—seen as central to repudiating the legitimacy of possessing nuclear arms—remains unsettled.¹⁵ Disarmament will have relatively little near-term appeal for states relying on their own nuclear arsenals or on

extended nuclear deterrence. TPNW member states and antinuclear advocates, however, are likely to use the coming years to institutionally develop the treaty and further stigmatize the bomb.

Recent events have strengthened the Nuclear Ban proponents' disarmament narrative. The seriousness of Putin's threats may well frighten younger generations with no memories of the Cuban missile crisis or duck-and-cover drills. In the past, nuclear fears dealt primarily with the idea of a nuclear "sword" that could be used in devastating attacks. But Russia has also used nuclear arms as a "shield" to deter external intervention in its conventional war on Ukraine. Moscow's nuclear arsenal has enabled mass casualties and human suffering both on the battlefield and among the Ukrainian civilian population in Bucha, Mariupol, and beyond.

Second, emerging great-power competition among the United States, China, and Russia is a significant setback to nuclear disarmament efforts premised on phased reductions of bilateral U.S.-Russian arms control.¹⁶ It calls into question these states' dedication to the disarmament pledge entailed in Article 6 of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). These traditional arms control and disarmament approaches faced hurdles before February 2022, but they seem even less viable at the moment. Russia's suspension of the New Strategic Arms Reduction Treaty (New START) in February 2023 is illustrative, as is China's ongoing expansion of its nuclear arsenal.¹⁷ Flagging progress toward eliminating nuclear weapons has led disarmament to become the main alternative nuclear narrative to the status quo. Now, the nuclear dynamics of Putin's war are highlighting the very injustices that Nuclear Ban proponents critique.¹⁸

If any doubts remained about the TPNW's staying power, the war in Ukraine helped erase them. Equipped with compelling new evidence of nuclear dangers and increased nuclear salience, Nuclear Ban advocates have moved to consolidate the treaty as a fixture of the global nuclear order. As interest in nuclear disarmament grows, the TPNW has risen as the most prominent instrument for achieving this objective. Continued avoidance of the TPNW could carry risks for the great powers' credibility on nuclear nonproliferation and disarmament, their relationships with the Global South, and the continuity of their military alliances.

More Nuclear Proliferation or More Nuclear Disarmament?

An increase in the number of nuclear-armed powers would be antithetical to the aims of the TPNW and its global prohibition on the bomb. But since February 2022, many pundits and politicians have argued that Russia's actions will incentivize nuclear proliferation among nonnuclear-armed states.¹⁹ The basis of this claim is that Russia invaded a sovereign nation,

Ukraine, which, in exchange for assurances about its territorial integrity, gave up the nuclear weapons it inherited when the Soviet Union broke apart.²⁰ Perhaps, the logic goes, if Ukraine had retained those weapons, it could have deterred Russia's attack.²¹ Former U.S. President Bill Clinton even appeared to back this notion in April 2023 by expressing regret for pushing Ukraine to disarm.²²

If one endorses this thinking, clear implications for global nuclear proliferation and disarmament emerge. For instance, former U.S. Ambassador to Ukraine Steven Pifer highlights the potential precedents created by Russian actions: "What Russia (which has the world's largest nuclear arsenal) has done to Ukraine (a country that gave up its arsenal) likely will rank high in the mind of those in future countries who consider whether to acquire, or to give up, nuclear weapons."²³ Michael O'Hanlon and Bruce Riedel take a similar tack: "If you have nuclear weapons, keep them. If you don't have them yet, get them, especially if you lack a strong defender like the United States as your ally, and if you have a beef with a big country that could plausibly lead to war."²⁴ Commentaries like these have become so ubiquitous in elite circles in places like Washington and Brussels that their lessons seem to be treated as "fact" in many ongoing policy discussions.

Consequently, fears of moral hazard have also arisen. U.S. Secretary of Defense Lloyd Austin has gone so far as to suggest that additional states will seek to proliferate so they may engage in aggression while under the protection of nuclear deterrence. In a November 2022 speech, Austin argued that leaders in other countries "could well conclude that getting nuclear weapons would give them a hunting license of their own."²⁵ If the Ukraine crisis indeed spurred additional cases of nuclear proliferation, it would be a considerable blow to the TPNW.

This would be the case regardless of whether countries acquired nuclear weapons with the intent to use them or for the purposes of deterrence. The Nuclear Ban's prohibitions are motivated, in part, by the devastating humanitarian and environmental consequences of nuclear use. For example, the International Committee of the Red Cross warns that humanitarian agencies lack the capacity to address casualties from blast, thermal wave, radiation, and radioactive fallout following a nuclear detonation.²⁶ Champions of the Nuclear Ban also reject nuclear deterrence as a dangerous and immoral source of security. They argue that leaders do not always act rationally, which is a key condition for successful deterrence strategy, and that the high nuclear readiness and alert levels required for credible deterrence imperil the world.²⁷ Nuclear Ban advocates also point to the many accidents involving nuclear weapons and the consequences of 2,056 nuclear explosive tests that have taken place over the decades.²⁸ To many TPNW proponents, the avoidance of nuclear disaster throughout the Cold War was the product

of luck, not the careful and rational execution of deterrence.²⁹ Nuclear proliferation would thus pose major setbacks to the Nuclear Ban agenda.

Reactionary policy takes are a normal and expected part of every major international event. Nuclear proliferation would have considerable consequences for global security, U.S. alliances, and the future of nuclear nonproliferation and disarmament. Reflecting on some of the assumptions of these prognostications can therefore be a useful exercise. Before weighing the evidence from the Ukraine war, we explore whether practitioner predictions align with systematic academic research on nuclear proliferation. Overall, we find some reasons to be skeptical and are relatively more optimistic about nuclear forbearance and the prospects for the TPNW.

At first glance, those expecting additional proliferation in light of the war in Ukraine may appear to be correct. The dominant theories explaining nuclear proliferation focus on the demand side of the equation due to security concerns. These theories predict that states seek nuclear weapons to deter serious security threats: adversaries with superior conventional forces or nuclear weapons.³⁰ States may observe Russia's ongoing aggression and consider the deterrent value of having the bomb. Problematically, a cascade or domino theory of nuclear proliferation predicts that proliferation begets proliferation. Research indicates that nuclear dominoes are not merely a myth, although states reacting to an adversary's proliferation do not always complete their journey to nuclearization. For example, Nicholas Miller finds that China's first nuclear test explosion in 1964 led leaders to ponder the bomb in Australia, India, Indonesia, Japan, and Taiwan. Only India eventually became a nuclear-armed state.³¹

More than thirty states have explored building a nuclear weapons program during the nuclear age. Yet, only ten states have developed indigenous nuclear weapons.³² Scholarly research explains this outcome in several ways. We unpack four of the—not always mutually exclusive—main reasons below, showing their relevance to nuclear reactions to the war in Ukraine and the future of the Nuclear Ban.

The Role of Alliances with Nuclear-Armed States

One alternative to building an indigenous nuclear program is to rely on extended nuclear deterrence. During the Cold War, the United States created a system of alliances to deter the Soviet Union, but these alliances also served U.S. nonproliferation goals.³³ The view was that American protégés would not need an independent nuclear arsenal if they had credible U.S. protection. Based on large-N statistical analysis, Philipp Bleek and Eric Lorber find that states receiving security guarantees from a nuclear-armed patron are less likely to explore, pursue, or acquire their own nuclear deterrent.³⁴

Moreover, Alexandre Debs and Nuno Monteiro employ detailed qualitative and game-theoretical evidence to demonstrate that states will be willing to pursue the bomb only if they lack a reliable nuclear ally.³⁵ Eric Brewer, Nicholas Miller, and Tristan Volpe thus conclude, “countries with allied protection are less vulnerable to external aggression than Ukraine and therefore less likely to feel compelled to seek a nuclear deterrent.”³⁶ Of course, rising security challenges may lead to doubts about the credibility of such guarantees, requiring further assurances from the United States. But relying on the so-called nuclear umbrella is directly at odds with the TPNW’s prohibitions. States that turn to extended nuclear deterrence to counter threats from Russia and beyond are a challenge to the Nuclear Ban.³⁷

U.S. Efforts to Prevent Nuclear Proliferation

Extended deterrence is just one of several tools used by the United States to prevent the emergence of new nuclear weapon states. Since the 1960s, Washington has promoted several “strategies of inhibition,” including sanctions, treaties, diplomacy, and coercion.³⁸ These efforts will also serve to dampen proliferation pressures stemming from Russia’s war on Ukraine. For instance, Miller finds that states vulnerable to U.S. sanctions are less likely to proliferate.³⁹ Another economic argument is offered by Etel Solingen, who posits that governments seeking integration within the global economy will reject nuclear weapons.⁴⁰ In Solingen’s book, the case studies of economic integration deal with becoming part of the U.S.-led liberal economic order, so the theory is predicated upon U.S. leadership.⁴¹

The United States has long been at the forefront of promoting the non-proliferation regime. Rebecca Davis Gibbons argues that almost all U.S. presidential administrations since Lyndon B. Johnson’s have exerted considerable diplomatic effort in universalizing the NPT and promoting nuclear safeguards.⁴² Washington has also led the development of adaptations to the nonproliferation regime when weaknesses in the institutional framework became apparent. These and other scholarly works indicate that the United States will work to stop future proliferation, whether it is motivated by the war in Ukraine or not. Emerging multipolarity and tension among the United States, Russia, and China may make U.S. nonproliferation efforts more difficult over time.⁴³ Nonetheless, for the foreseeable future, the United States will retain many of the nonproliferation tools it has used historically.

U.S. leadership in the nonproliferation regime may mean less proliferation, but it is unlikely to be good news for proponents of the Nuclear Ban agenda. If Russia’s war brings countries deeper into the American fold, Washington will have greater leverage over them. The United States objects

to the TPNW and has a track record of pressuring its allies to refrain from joining the agreement.⁴⁴

Managerial Challenges of Building Nuclear Weapons

The challenge of building an indigenous nuclear weapons program is also an impediment to proliferation in response to Russia's invasion of Ukraine. In detailed case studies of Iraq's and Libya's pursuit of nuclear weapons, Målfrid Braut-Hegghammer illustrates how weak state capacity can hamper progress toward the ultimate weapon.⁴⁵ Similarly, Alexander Montgomery finds that even when states are able to secure sensitive nuclear assistance, they are often unable to successfully translate this help into acquiring the bomb.⁴⁶ Brewer, Miller, and Volpe note other obstacles to finalizing a nuclear program, including military attacks by adversary states and various types of sabotage.⁴⁷ All of these dynamics would be at play in a proliferation attempt.

Another nuclear development stumbling block is the vast system of intrusive International Atomic Energy Agency (IAEA) safeguards. These verification measures, pursuant to Article 3 of the NPT, have significantly increased the ability of the international community to both detect and deter nuclear proliferation.⁴⁸ Fear of preventive strikes and punishment from nuclear suppliers and the broader international community may thus encourage states to be satisfied with nuclear latency—the ability to develop nuclear arms without having crossed the proliferation threshold. A growing number of scholars suggest that such latency short of the bomb may have some deterrent and compellent benefits.⁴⁹ Even if states opt for latency over proliferation, however, this is no guarantee that they will be willing to embrace the TPNW.

Strong Norms against Nuclear Weapons Development and Use

The scholarly literature offers a modicum of optimism for the future of the TPNW. The increased salience of nuclear dangers due to Russian nuclear saber-rattling may draw attention to normative reasons for states to reject nuclear weapons and join the TPNW. Maria Rost Rublee shows that international crises have contributed to creating normative environments that affect state decisions about nuclear weapons. She argues that the success of the nonproliferation regime must be understood as an outcome of socialization wherein states feel pressure not to go nuclear.⁵⁰ Matthew Fuhrmann and Xiaojun Li find that norm diffusion brings states into regional nuclear-weapon-free-zone (NWFZ) agreements. If the nuclear dynamics of the war convince more states in a region to accede to the TPNW, their neighbors

may be more likely to join as well. Fuhrmann and Li's analysis seems to hold only in regions without significant militarized disputes, however. This shows the predominance of security considerations in decision-making about nuclear treaties.⁵¹ Similarly, Espen Mathy suggests that states facing regional normative pressure are more likely to join the TPNW, but only in places where the Nuclear Ban is not perceived to weaken national security.⁵² Mathy's argument corresponds with those of Stephen Herzog, who demonstrates the centrality of security considerations in many NPT and Comprehensive Nuclear-Test-Ban Treaty (CTBT) ratifications.⁵³

How are nonnuclear norms faring today? As Nina Tannenwald explains in the context of the Ukrainian conflict, the nuclear taboo, "while widely shared, is more fragile than other kinds of norms because a small number of violations would likely destroy it."⁵⁴ Tannenwald also describes the taboo as a prohibition on being the first to use nuclear weapons, which therefore faces challenges from Putin's threats.⁵⁵ Still, nuclear weapons have not been used, and the norm remains unbroken. Countries are not rushing to withdraw from the NPT, a treaty that scholars have shown to be durable even when it has been challenged by contentious world events.⁵⁶ The norms of nonproliferation and the nuclear taboo are also both promoted and strengthened by the states that have joined the TPNW. And the extant scholarly research indicates numerous opportunities for the propagation of antinuclear norms to states that do not face serious security threats. Even if nuclear proliferation appears under control at the moment, that distinction is worthy of note. The scholarly literature predicts a sharp division between states that will rely on nuclear benefactors and those that may opt for the TPNW.⁵⁷

In sum, many factors push against nuclear acquisition, despite the fact that a nonnuclear state has been the victim of a nuclear-armed state's aggression. As Robert Einhorn cautions when commenting on the flurry of Ukraine war-induced proliferation predictions, "nuclear proliferation does not occur in theory. It occurs in particular countries, with particular security situations and adversaries, security relationships with friendly states, national priorities, technological and financial capabilities, and domestic balances of political power."⁵⁸ The scholarly literature about the causes of nuclear proliferation and restraint suggests that a cascade of proliferation is unlikely in the coming years. Many states may even be motivated for normative reasons to reject nuclear weapons and, potentially, to join the TPNW. These points notwithstanding, the relevant scholarship predicts a growing schism between those states that embrace disarmament on normative grounds and those that view nuclear weapons and deterrence as vital to their national security.

Russia's war on Ukraine will have heterogeneous effects around the world. Opponents of the bomb will see the nuclear dynamics of the conflict

as the epitome of the problems of the atomic age. The war will reinforce their arguments favoring nuclear disarmament. For those who perceive security benefits from these weapons, the war will cause them to rely more on nuclear deterrence. Reconciling these views promises to be a significant, if not the utmost, challenge to the future of the global nuclear order.

State-Level Evidence

Relevant scholarly and policy literature predicts that events like Russia's war on Ukraine will polarize countries around the globe, but what does the evidence actually say? Are states moving toward the deterrence or the disarmament camp? Here, we explore how states have approached the TPNW politically since February 2022. The picture appears to be much more indeterminate than a simple story of polarization. In fact, two main narratives about nuclear weapons have risen to the fore. How governments will react to them will likely depend on the evolution of the nuclear dynamics of the war. This presents both challenges and opportunities for the Nuclear Ban.

The first narrative points to the unique set of dangers presented by wars involving nuclear-armed states. According to the latest open-source estimates, Russia has a stockpile of 5,889 warheads, many of which are orders of magnitude more powerful than those that were dropped on Hiroshima and Nagasaki in 1945. These weapons include nearly two thousand tactical nuclear weapons intended for battlefield use.⁵⁹ And in June 2023, Putin confirmed that Russia had begun to forward-deploy such tactical nuclear weapons in Belarus, which borders Ukraine.⁶⁰ Repeated nuclear threats from Putin and other Russian officials raise the specter that the long-standing taboo on using these weapons will be shattered. Perhaps even scarier, Russia's deterrent threats directed at preventing NATO intervention in Ukraine show that nuclear weapons can be employed as a tool to challenge the sovereignty of nonnuclear states. Ukraine's very survival as a state is in jeopardy.⁶¹

The scariest possibility is that of a strategic nuclear exchange. Ukraine borders NATO territory, and the main backers of the government in Kyiv are member countries of the Atlantic Alliance. The three NATO nuclear powers—Britain, France, and the United States—have a combined 5,759 nuclear weapons, virtual parity with Moscow.⁶² The United States also deploys approximately one hundred tactical nuclear weapons in five NATO countries: Belgium, Germany, Italy, the Netherlands, and Turkey.⁶³ Unclear redlines, potential misperceptions, and accidental spillover all pose risks of escalation to a civilization-threatening nuclear war.⁶⁴ While the chances of nuclear use and nuclear war still seem quite low, such odds have increased considerably due to the war in Ukraine. The threats that nuclear

arms pose to sovereignty and humanity thus form the basis of a nuclear narrative that favors the TPNW and its approach to banning the bomb. In theory, the prevalence of this narrative should serve as a check against additional nuclear proliferation and result in the diffusion of pro-disarmament norms.

The second narrative acknowledges the inherent dangers of nuclear weapons but concludes that this is precisely why greater reliance on nuclear deterrence is needed. Ukraine was invaded by Russia, which had joined with Britain and the United States to offer Kyiv security assurances in the 1994 Budapest Memorandum. The three states did so in exchange for Ukraine transferring to Russia the world's third-largest nuclear arsenal—inherited when the Soviet Union collapsed—and joining the NPT as a nonnuclear state. Though Ukraine did not have operational control of the weapons, it could have leveraged its technology inheritance and know-how to develop an arsenal.⁶⁵ Few, if any, observers think that Moscow would have attacked a nuclear-armed Ukraine that could have retaliated with strikes against Russian population centers and strategic military targets. One resultant reading of Ukraine's history is that nuclear disarmament is unwise because it makes a state vulnerable to invasion.⁶⁶ This interpretation of events is hardly sympathetic to the arguments of the Nuclear Ban activists and for TPNW membership. It calls for greater reliance on nuclear weapons to protect national sovereignty and survival.

Ukraine also lacked nuclear security guarantees like those of the NATO countries and others under the U.S. nuclear umbrella. Russian forces have occupied territory in both Ukraine and Georgia, purportedly over ethnopolitics disagreements. But in the case of a similar dispute with Estonia, covered by NATO's Article 5 mutual defense pledge, the Kremlin resorted to plausibly deniable cyberattacks.⁶⁷ Moscow has also engaged in campaigns of influence, election interference, and espionage against other NATO states. The point remains, however, that Russia seems much more willing to overtly attack states that do not have formal nuclear security guarantees. After all, such assurances are believed to be demonstrations of resolve by the United States to defend its protégés.⁶⁸ The second narrative would therefore call for a rejection of the TPNW, either in favor of indigenous proliferation or further dependence on extended nuclear deterrence.

Whether states are proponents of disarmament or deterrence, Russia's attack on Ukraine will affect perceptions of security assurances issued by nuclear-armed states. The contravention of the Budapest Memorandum would seem to undermine future Russian pledges to partners, who will certainly want stronger legal agreements. Whether such doubts will extend to other security guarantors, like the United States, is not clear. But, as Francesca Giovannini writes, the war in Ukraine shows that “a patchy

regime of negative security assurances [is] . . . profoundly inadequate to provide the kind of reassurances that non-nuclear-weapon states might require in a highly unpredictable global nuclear order.”⁶⁹ Russian actions and broader concerns about the responsibility of nuclear-armed NPT states could lead to calls for stronger and more universal security guarantees.

By and large, states from the Global South have found the first narrative about nuclear dangers and disarmament imperatives to be more compelling than the second narrative about deterrence. This position, however, is not a new development. Scholars such as Benoît Pelopidas have also written about why it is unsound to assume, *a priori*, a universal desire for nuclear weapons among states.⁷⁰ States from Latin America and the Caribbean signed the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco) in 1967, establishing the world’s first NWFZ partly in response to the grave fears that accompanied the Cuban missile crisis.⁷¹ Since then, other states in the Global South have contributed to the development of these zones in Africa, Central Asia, the South Pacific, and Southeast Asia. Many of these nonnuclear states without nuclear security assurances spearheaded the negotiation of the TPNW in 2017.⁷² Today, states from the Global South form the majority of the treaty’s membership base.

At the first TPNW Meeting of States Parties in 2022, the nuclear dynamics of the war in Ukraine confirmed the disarmament views of numerous governments. United Nations (UN) Secretary General António Guterres opened the Vienna meeting with a video address capturing these sentiments, stating, “We must stop knocking on doomsday’s door” and “Let’s eliminate these weapons before they eliminate us.”⁷³ The treaty members proceeded to discuss timelines for eliminating weapons, plans for universalizing the agreement, and ways to compensate victims of nuclear attacks and nuclear explosive tests.

However, the meeting’s attendees offered no explicit condemnation of Russia by name for its nuclear threats. The meeting’s Vienna Declaration instead states, “We are alarmed and dismayed by threats to use nuclear weapons and increasingly strident nuclear rhetoric. We stress that any use or threat of use of nuclear weapons is a violation of international law, including the Charter of the United Nations. We condemn unequivocally any and all nuclear threats, whether they be explicit or implicit and irrespective of the circumstances.”⁷⁴ This portion of the statement—and, specifically, whether to single out Russia—was hotly debated. Many of the delegations in Vienna objected because they viewed Russia’s behavior as part and parcel of relying on nuclear deterrence. To them, Moscow’s actions were simply further evidence of a long history of nuclear threats and misbehavior by great powers.⁷⁵ A more cynical interpretation is that states from the

Global South were not keen to criticize Russia and suffer future economic or political repercussions.⁷⁶ Scholars have also argued that some states in the Global South have long chosen not to condemn Russian actions as a way of protesting decades of perceived Western hypocrisy in upholding the rules of the liberal international order.⁷⁷

One metric that can help to gauge the strength of the disarmament narrative is membership in the TPNW. The treaty opened for signature in 2017, and only nine of the sixty-nine ratifying parties and seven of the ninety-three state signatories took those actions after Russia launched its full-scale invasion of Ukraine in February 2022.⁷⁸ So far, the war does not seem to be resulting in significant new membership for the Nuclear Ban, perhaps due to security concerns created by Russia's actions.⁷⁹ But this fact may also indicate that most states without significant domestic debates about TPNW accession have already joined the treaty.⁸⁰ States that have not joined either reject the treaty or face a more difficult decision process, due either to national considerations or international pressures.

The growing divide between proponents of disarmament and deterrence predicted by the literature was evident in Vienna. Security concerns were paramount in the statements made by several nuclear umbrella states that were observers to the proceedings.⁸¹ Their sentiments aligned with the second narrative about an increasing need to rely on nuclear deterrence. The representative of Norway, a country that has been at the forefront of the movement to draw attention to the humanitarian impacts of nuclear weapons, stated that "Russia's rhetoric on nuclear weapons is reckless and dangerous." Yet, for Oslo, "signing the TPNW . . . would be incompatible with our NATO obligations."⁸² Meanwhile, the German representative noted that his country faced a hostile Russia and would thus not be bound by the Nuclear Ban. To do so "would collide with [Germany's] membership in NATO including nuclear deterrence."⁸³ Finland and Sweden were also present as observers in Vienna, though they had already moved to gain protection from Russia by joining NATO.⁸⁴ Other umbrella states, like Japan and South Korea, did not send a delegation to observe the proceedings.

The case of South Korea shows just how difficult it will be for the disarmament narrative to appeal to states facing nuclear threats. In January 2023, President Yoon made off-the-cuff remarks about the need to proliferate to deter North Korea.⁸⁵ Part of the discussion surrounding these comments dealt with the focus on a disarmed Ukraine being targeted by a nuclear-armed Russia.⁸⁶ Yoon eventually walked back his statements about building the bomb, but South Korea received stronger U.S. assurances in April 2023 through the so-called Washington Declaration.⁸⁷ Consistent with the relevant scholarship, U.S. nuclear umbrella commitments—though sometimes requiring modification—continue to be sufficient to

prevent allies from proliferating. A treaty banning nuclear weapons does not seem to have much appeal at the moment for states facing challenging regional security environments.

The nuclear-armed states have also not moved in the direction of the TPNW since February 2022. Indeed, none of the nine—Britain, China, France, India, Israel, North Korea, Pakistan, Russia, and the United States—participated in the negotiation of the Nuclear Ban. When the TPNW opened for signature, the three NATO nuclear states denigrated the treaty as “incompatible with the policy of nuclear deterrence, which has been essential to keeping the peace in Europe and North Asia for over 70 years.”⁸⁸ The Trump administration also unsuccessfully attempted to pressure several states to withdraw their ratifications so that the TPNW could not enter into force in 2021.⁸⁹ Such opposition is not limited to NATO’s nuclear-armed members. After the TPNW’s First Meeting of States Parties in June 2022, Russian Foreign Ministry spokeswoman Maria Zakharova condemned the treaty, stating, “devising the TPNW was premature, erroneous and, essentially, counterproductive.”⁹⁰ Moscow has since used versions of this wording when discussing the TPNW in multilateral diplomatic fora.

Russia’s war on Ukraine has also made efforts to engage in nuclear arms control and eliminate nuclear stockpiles more complicated. In the past, the United States and Russia claimed to be working toward their NPT Article 6 disarmament commitments through bilateral nuclear arms control. Russia’s suspension of New START in February 2023 has therefore created serious questions about the future of arms control.⁹¹ Nearly all of the nuclear-armed states are modernizing their arsenals and expanding the role of nuclear weapons in their military doctrines. The war in Ukraine is yet another example of how the tensions of great-power competition affect the world and the nuclear order. A return to arms control, much less an embrace of the TPNW, seems unlikely given the contours of U.S.-China-Russia competition.⁹² Yet, these failures to deliver on the promises of Article 6 have drawn much scrutiny and critique on fairness and justice grounds at NPT Review Conferences.⁹³

At the moment, Russia’s nuclear rhetoric seems to be accentuating existing divisions between the pro-deterrence and pro-disarmament camps. Questioning the durability of such trends is worthwhile, however. Take Germany, for example, where the Greens are in the coalition government and support joining the TPNW.⁹⁴ Or consider Sweden, whose government has funded the new Alva Myrdal Centre for Nuclear Disarmament at Uppsala University and has suggested the need to create a NATO working group on nuclear disarmament after it joins the Atlantic Alliance.⁹⁵ In Australia, the Labor Party committed to join the TPNW in 2018 and is now in power. Australia was an observer to the first TPNW Meeting of States Parties and in

October 2022 abstained on a UN First Committee resolution on the treaty, a departure from its past opposition.⁹⁶ Yet, Canberra's "Defence Strategic Review 2023" notes, "Our best protection against the risk of nuclear escalation is the United States' extended nuclear deterrence, and the pursuit of new avenues of arms control."⁹⁷ Still, it is not unreasonable to believe that, as time passes, the appeal of the Nuclear Ban will return in democratic states with U.S. nuclear umbrella pledges. While Putin's nuclear threats may initially cause shock and bolster the nuclear deterrence narrative, they also provide evidence that could ultimately enhance the nuclear disarmament narrative and require alterations to the structure of military alliances.

The Public and Nuclear Disarmament

Government policy on nuclear weapons represents only one side of the discussion on the future prospects for the TPNW. Less immediate, but perhaps equally important, is the role of public opinion, particularly in democratic states that possess nuclear weapons or rely on extended nuclear deterrence. Beatrice Fihn, former executive director of the Nobel Peace Prize-winning International Campaign to Abolish Nuclear Weapons (ICAN), has explained that the public is crucial to the Nuclear Ban campaign. In an interview, Fihn stated that "politicians are very sensitive to changes in public opinion" and that this would be a mechanism for change.⁹⁸ Essentially, the Nuclear Ban movement is premised on an idea of long-term, bottom-up political change.

Whether that mechanism can be successful in inspiring nuclear disarmament remains to be seen. What can be done now is to evaluate recent trends in public opinion. We do so here within the context of the United States and its international alliances. As these states are the democracies under greatest pressure and scrutiny from the Nuclear Ban campaigners, the views of their publics provide benchmarks for understanding the challenges that lie ahead for the TPNW. We find that the debate over the TPNW is largely unsettled, although many of these publics are moving away from nuclear disarmament as nuclear salience increases.

Before the war in Ukraine, the academic literature on opinion toward the TPNW showed mixed results.⁹⁹ Stephen Herzog, Jonathan Baron, and Rebecca Davis Gibbons noted that, while 65 percent of Americans supported the Nuclear Ban in principle, only 26 percent claimed to have heard of it. When the U.S. public was presented with realistic government rhetoric critiquing the treaty, support fell to below a majority.¹⁰⁰ A parallel study in Japan, however, concluded that the Japanese government could not effectively counter the 75 percent support rate for the TPNW among its public.¹⁰¹ And in the Netherlands, Michal Onderco and colleagues found

that the Dutch public was only really interested in joining the Nuclear Ban alongside other members of NATO.¹⁰²

Another frequently mentioned example of prewar public support for the TPNW is the ICAN Cities Appeal. This initiative encourages local and regional legislative bodies to endorse the TPNW in resolutions even if their national governments do not support the treaty. Several hundred of these bodies had joined prior to the war in Ukraine, and more continue to do so.¹⁰³ This is a considerable accomplishment and analogous to efforts by the campaign to have localities endorse the Paris Climate Accords. Few of these resolutions receive popular endorsement through a referendum or other ballot measure, however, so they do not help to establish a useful baseline measurement of public views. Further polling would be required to assess the relationship between local nuclear disarmament resolutions and public opinion.

Polling since February 2022 also indicates shifts in European public opinion toward nuclear weapons that should disturb Nuclear Ban campaigners. Putin's war in Ukraine and his nuclear threats appear to have made populations more supportive of having nuclear protection pledges. This response likely reflects the fear that European publics continue to experience given their proximity to both Ukraine and Russia. News in Europe regularly includes stories about nuclear weapons effects, the locations of bunkers and other shelters, and instructions on how to survive a nuclear attack. Unfortunately, this is to be expected with Putin's rhetoric and Russia's behavior. Since this war began, the world has seen reckless Russian strikes at the Zaporizhzhia Nuclear Power Plant, the Kremlin's use of conventionally armed but nuclear-capable missiles against Ukrainian civilians, and Russian state media simulating nuclear strikes on Berlin, London, and Paris.¹⁰⁴ Citizens in some European states have even stockpiled iodine pills to provide protection in the case of exposure to radiation.¹⁰⁵ Increased nuclear salience in Europe could eventually lead to more support for the TPNW. As of now, it has usually been accompanied by government messaging about the centrality of NATO and the security the alliance provides to its members.

One key piece of evidence pertains to public opinion on the NATO membership applications of Finland and Sweden, submitted just months after the war began. Tuomas Forsberg reports that a small, stable minority of just 20–30 percent of Finns supported NATO accession for decades following the Cold War. Then, “public opinion changed dramatically almost overnight during the week the war broke out in late February.” By May 2022, 76 percent of the population favored joining NATO.¹⁰⁶ The situation was slightly different in Sweden, where a plurality had supported joining NATO prior to the war. By April 2022, this number had risen to 53

percent.¹⁰⁷ To be sure, NATO membership has benefits beyond protection with nuclear arms. Nonetheless, these polling results show the Finnish and Swedish publics embracing an explicitly nuclear-armed alliance.

Another survey-based academic study directly addresses how the war in Ukraine may have affected attitudes regarding nuclear weapons. Onderco and colleagues employed a two-wave recontact study. They found Dutch and German citizens to be more hawkish on nuclear issues in June 2022 than in September 2020. The results from both countries suggest an increase in the perceived deterrent value of nuclear arms and in willingness to support the use of these weapons.¹⁰⁸ Along the same lines, the news program *Tagesschau* conducted a poll in summer 2022 that found, for the first time, a majority of Germans—52 percent—now wanting to retain long unpopular U.S. tactical nuclear weapons on their country's soil.¹⁰⁹ These sorts of polling numbers sharply contrast with findings from a 2019 survey. That study suggested that a majority of Europeans in nine countries—including over 70 percent of Germans—wanted their governments to push for nuclear abolition.¹¹⁰ Such results over time indicate that the deterrence narrative may be catching on with certain European publics at the expense of the disarmament narrative and the TPNW.

In Central and Eastern Europe, endorsement of the Nuclear Ban also seems unlikely to gain popularity with the public at present. Lauren Sukin and Alexander Lanoszka polled Estonians, Latvians, Lithuanians, Poles, and Romanians early on in the war in Ukraine. Their study found very high confidence in the United States, NATO, and nuclear policymaking within the Atlantic Alliance. At the same time, public support for national nuclear proliferation was surprisingly high for countries under the U.S. nuclear umbrella, even constituting a majority in Poland, whose government is now also interested in hosting American tactical nuclear weapons.¹¹¹ Strong public support in umbrella states for nuclearization is not an entirely new phenomenon. For example, polling has shown stable majority public support for proliferation in South Korea for over a decade.¹¹² Whether these views will actually result in proliferation remains to be seen. Politicians in Poland and South Korea have thus far seemed content with different variations of U.S. security assurances. What is clear, however, is that public opinion of the sort registering across North America, Europe, and East Asia does not translate into support for the TPNW.

Among Americans, December 2022 polling of a nationally representative sample indicated that 69 percent of people had increased nuclear anxieties. Respondents were “extremely or somewhat concerned about the possibility of a nuclear war in the next five years,” marking an 8 percent increase from the previous year.¹¹³ Although the results show greater concern about a potential nuclear war, this increase is considerably less than

might be expected given many months of media coverage of nuclear threats from Putin. The poll also does not provide any information about whether these fears will translate into greater support for nuclear deterrence or for nuclear abolition. Both are conceivable.

In January 2023, David Allison and colleagues assessed support for the TPNW among the U.S. population. The authors told some U.S. respondents that Russia, China, and other nuclear-armed states had not joined the TPNW and then asked them if they thought the United States should ratify the treaty. A plurality of respondents did not favor ratification. In total, the study found that 37 percent of Americans supported ratification under the current international circumstances, compared to 44 percent who did not and 19 percent who were undecided.¹¹⁴ The results suggest that any future entry of the United States into the TPNW would need to be done alongside Washington's rivals.

Surveys provide snapshots of public views at specific moments in time, so results can vary as world events unfold. That said, how might we interpret this January 2023 polling evidence? Public opinion about nuclear weapons since the onset of Russia's full-scale invasion of Ukraine represents early reactions to the crisis. People, particularly in Europe, are now dealing with emotions of fear and surprise as they grapple with the unpleasant nuclear realities laid out by Alexander Bollfrass and Stephen Herzog:

In making nuclear threats overt, Putin has focused public attention on nuclear dynamics and processes usually consigned to obscure technocratic and elite activity. In Europe, each Russian threat has illuminated once-suppressed nuclear facts of life. Helpless publics are waking up to the harsh truth that there is no reliable protection against city-destroying nuclear-armed missiles that can arrive from Russia in under half an hour. Meanwhile, the tool on display to prevent such horrific devastation is a promise that France, the UK and the US are threatening to retaliate in kind if a Russian missile lands on NATO territory. This is, after all, the world of nuclear deterrence based on "mutual assured destruction" created and refined in the aftermath of the Second World War.¹¹⁵

For now, the result of increased nuclear salience in many countries has been greater endorsement of a nuclear deterrence posture and a desire for strengthened U.S. nuclear security guarantees. Nuclear Ban advocates are also using this moment to communicate with the public about nuclear risks in the hope of starting a more open debate with deterrence advocates, most of whom have been content to ignore the TPNW.

This moment of growing support for nuclear deterrence need not last forever. Putin's nuclear threats have dramatically increased the salience of

nuclear weapons. In late February 2022, worldwide Google searches for some nuclear weapons–related topics were hundreds of times higher than in previous days. A “new normal” for nuclear salience was quickly established as the media and experts rushed to explain the bomb to anxious publics. For the moment, public views appear to largely mirror those of government policy. But the debate over the TPNW and nuclear disarmament is still new to the public, marked by indecision and knowledge gaps, and thus unsettled. Over time, the dangers of nuclear weapons that have manifested during the war in Ukraine could help shift public views toward disarmament.

Conversely, the global public could also move past fears of nuclear weapons after the war in Ukraine ends, or even during it if the conflict stalemates. A return to the public apathy toward nuclear weapons that characterized much of the post–Cold War period is not outside the realm of the possible. Were this to occur, further movement toward disarmament would seem unlikely absent strong activism to keep nuclear dangers in the public eye.

The Nuclear Use Question

Trends in state behavior and public opinion could completely change if Moscow resorted to the nuclear option to decisively alter the course of its war with Ukraine. Fears of this nature have gained traction as Russian military setbacks in Ukraine have accumulated.¹¹⁶ No one except Putin knows the actual likelihood that Russia will cross the nuclear threshold in the context of the war. Nuclear weapons use remains unlikely, even as its probability has increased since February 2022. Attaching a percentage to the potential for nuclear use is exceedingly difficult, though some experts have tried.¹¹⁷ More apparent than the likelihood of nuclear use is the conclusion that a nuclear detonation would inevitably carry monumental political consequences for the global nuclear order. Were Putin to order the use of a nuclear weapon, however, the result could either strengthen arguments in favor of the Nuclear Ban or bolster the position of those relying on nuclear deterrence. The main determinant of this outcome would depend on the effects of a strike and on whether nuclear use was seen to be militarily and politically beneficial to Russia.

Russian nuclear threats during the war in Ukraine have sparked both outrage and media fixation, but they are hardly the first such threats during the atomic age. For example, analysts from the Stimson Center tracked more than seventy overt nuclear threats made by leaders from 1970 to 2010.¹¹⁸ Since then, many additional threats have been made, including Donald Trump’s memorable “fire and fury” Twitter spat with North Korean Supreme Leader Kim Jong Un. Unpalatable as nuclear threats may be to members of the public, they are central to the strategy of nuclear deterrence

and to making nuclear strikes credible in the minds of adversaries. Despite many of these threats, nuclear use has not occurred since 1945. But due to their relationship with nuclear escalation and coercion, nuclear threats are strictly prohibited by the TPNW and were condemned in the Vienna Declaration of the treaty's First Meeting of States Parties. Putin's nuclear threats are already contributing to polarization between disarmament and deterrence proponents.

If these threatening actions short of nuclear use can affect state positions, what might happen if Russia really did use nuclear weapons? Academic research offers several possibilities for how governments and states might respond to nuclear strikes. The literature is clear that such reactions are context dependent. In some cases, nuclear use could prompt greater interest in seeking nuclear weapons for national security. In other cases, a nuclear attack might reaffirm antinuclear norms by showing the world the horrors of the immediate and longer-term effects of nuclear explosions. These theoretical predictions provide insights into what events might unfold if the Kremlin were to resort to the nuclear option. Like Putin's nuclear threats, the possibilities discussed in the literature point to results in both directions. However, the first use of nuclear weapons since 1945 is likely to be a global tragedy, one with much more normative unifying power than nuclear deterrent threats. Such was the extent of mass human suffering inflicted in Hiroshima and Nagasaki that it created a nuclear taboo that has stood for over seventy-five years.

George Quester examines several factors that could affect the durability of the nonuse norm after a violation of the taboo. These considerations include the extent of damage caused by the detonation, the strategic consequences of nuclear use, the identity of the attacker and target, and the international response.¹¹⁹ On this last point, Tannenwald writes that, after nuclear use, "the international community would have to respond with extremely strong measures to reconstruct and strengthen [the taboo]."¹²⁰ Keir Lieber and Rebecca Davis Gibbons also make predictions about the durability of the norm after nuclear first use in warfare. In line with Quester's point about damage, they propose that a "dramatic demonstration of the abhorrent consequences of nuclear weapons use could serve to reinforce subsequent adherence" to antinuclear norms. This could potentially induce states to join the TPNW. But use with limited civilian effects could send the opposite message.¹²¹ The latter scenario could result in new ideas about the "usability" of nuclear weapons in conflict, which strikes at the core of the objectives of the Nuclear Ban Treaty.

A second key factor in determining how nuclear use is perceived is its strategic effectiveness. Put simply, does using the bomb accomplish an actor's objectives? If the Kremlin is able to use nuclear weapons and force

the government in Kyiv to surrender, observers will see that nuclear arms are pivotal to achieving victory in war. States and publics that currently view nuclear weapons as beneficial tools for providing security will remain unsympathetic to the arguments of TPNW supporters. In fact, more states may be incentivized to pursue the bomb to enhance their power or to avoid the tragic fate of Ukraine. Also plausible is that some TPNW proponents will no longer want to be constrained by the obligations of the Nuclear Ban given the world's grave nuclear dangers, though much would depend on the damage and humanitarian impacts of any attack.

The literature suggests that a perceived "effective use" with relatively low collateral damage would signal that nuclear weapons are useful and less horrific than previously believed. Some states and their publics might thus decide that nuclear possession is desirable and nuclear use permissible. Were this to occur, antinuclear norms and the TPNW would both face monumental setbacks. In contrast, nuclear use that does not allow Russia to achieve victory, that kills thousands of civilians, and that spreads radiation to surrounding areas will contribute to the rejection of nuclear weapons.

A nuclear explosion in a densely populated area would remind the world of the devastating humanitarian impacts of these weapons.¹²² Thousands of people around the epicenter of the attack would die immediately from buildings collapsing from the blast wave, many more would succumb to spreading fires, and others would perish from radiation sickness.¹²³ The imagery would likely galvanize a meaningful portion of the public and states around the world to call for nuclear disarmament. The TPNW would offer a policy option to these parties, as it already does to many who are appalled by Putin's nuclear threats and the risks associated with the Ukraine war. A strategically "successful" nuclear attack that causes mass civilian casualties may pull states in the direction of either disarmament or deterrence, but its physical effects and imagery would be sickening and impossible to deny.

A use of nuclear weapons that is not "cinematic," however, could degrade norms against using the bomb.¹²⁴ One potential scenario is a Russian "demonstration shot" over an unpopulated area to convince the Ukrainians into surrendering or ceding territory to Moscow. While this type of nuclear weapon use *could* theoretically bring the conflict to an end without killing thousands, it would not demonstrate the full destructive effects of nuclear weapons. The lack of significant casualties would risk blurring the normative bright line between conventional weapons and their nuclear counterparts. Alternatively, if a demonstration shot did not work to compel Ukrainian leaders to surrender, it might be read as unwillingness to use nuclear weapons in a populated area. This could undermine Russia's nuclear prowess, potentially pressuring Putin to use nuclear arms against a

populated area. If nuclear arms come to be seen by leaders and the public as a less taboo form of weaponry, the likelihood of their use in future conflicts will grow. This could put humanity on the path toward escalation to a strategic nuclear exchange that threatens all life on the planet.¹²⁵

The security value of nuclear weapons has already been demonstrated in Ukraine, however. NATO has avoided direct involvement in the war even as Russia has repeatedly and indiscriminately targeted civilians and committed grievous violations of human rights. Putin's nuclear threats lie at the heart of the West's inability to have boots on the ground or to implement a no-fly zone in the air over Ukraine. The lesson appears to be that nuclear weapons can shield military aggressors from outside intervention. If Russia, in spite of its poor battlefield performance, is able to defeat Ukraine, that would also send a clear message about the utility of nuclear weapons.¹²⁶ The successful prospects of the TPNW and related antinuclear norms are thus inextricably linked to the outcome of this war and the salience of the challenge posed by nuclear arms.

The TPNW in a World of Increased Nuclear Salience

On November 20, 1983, approximately one hundred million Americans—a significant portion of the national population—viewed the film *The Day After* on television. The film's showing came at a time of particularly high tensions during the Cold War. After watching intercontinental ballistic missiles detonate over communities in Kansas and Missouri, Americans watched in horror as survivors suffered in the aftermath of the fictional attack. One notable account of the event summarized the effects of nuclear weapons as follows:

We see virtually an entire populace reduced to vaporized silhouettes. We see blistered and blinded human gargoyles suffer slow death from radiation sickness. We see the crumbling of a society's restraints: the most law-abiding citizens emerge from the rubble of ground zero to loot, rape and pillage. As firing squads add to the mass graves, a few valiant survivors struggle to reconnect the severed communal bonds that distinguish life from mere existence. But their efforts erode as relentlessly as the deathly white ash that wafts down upon the blackened fields.¹²⁷

The Day After still holds the national record for U.S. television movie viewership. It undoubtedly increased the salience of nuclear weapons among the American public and reminded people of the potential devastation wrought by nuclear use.¹²⁸ Yet, surveys of Americans following the film's showing revealed surprising results. Researchers found that

individuals knew more about the effects of nuclear weapons, but the film did not change people's overall views about nuclear weapons and deterrence. Instead, it solidified their existing perspectives.¹²⁹ Those in favor of disarmament saw the film as strong evidence for nuclear abolition. Those in favor of deterrence redoubled their commitment to nuclear deterrence to protect the United States from such attacks.

A comparison of the nuclear dynamics of the war in Ukraine and *The Day After* seems apt. Four decades after the film aired, world events and great-power competition have spelled the return to public view of nuclear weapons, disarmament, and deterrence. The result of Putin's nuclear threats and employment of nuclear deterrence to shield his war against NATO intervention has likewise polarized international observers. The evidence shows that such trends are present at the level of both national governments and public opinion. Proponents of nuclear disarmament who favor the TPNW have found much support for their position in thinking about the risks that accompany threats of nuclear use. But for those actors who already believed in the value of nuclear weapons for national security, the lesson of the war is a confirmation of the need for nuclear deterrence postures. Thus, we are now witnessing the intensified polarization of existing opinions surrounding the legitimacy of nuclear weapons as tools of statecraft.

Unfortunately, researchers did not examine the long-term impact of viewing *The Day After*. Perhaps viewers remained staunchly committed to their previous positions even decades later. Perhaps over time their ideas about nuclear weapons changed. Or perhaps memories of the film dissipated and had no durable effects on nuclear attitudes. This topic is particularly relevant because it is unclear how increased nuclear salience surrounding the war in Ukraine will evolve on the international stage and in the public mindset. Of course, viewing a fictional account of nuclear use on television is considerably different from being bombarded with real-world media coverage about an adversarial leader threatening to use nuclear weapons.¹³⁰

Just as the views of Finns toward NATO changed "overnight" after Russia's invasion of Ukraine, global opinion could change quickly with actual nuclear use. A nuclear attack that shocks the conscience and yields human and structural devastation may lead the public and leaders to shift their attitudes definitively against nuclear weapons and toward the TPNW. If nuclear use were to appear more benign due to a detonation in an unpopulated land area like a forest, or over a body of water, norms against nuclear weapons and their use might weaken. Given this environment of uncertainty, what might states do in the global nuclear order in the coming years?

States and activists promoting the TPNW will likely face difficulties in attempting to universalize the treaty to states that depend on nuclear weapons.

For this reason, many of the discussions at the Vienna Meeting of States Parties focused on Article 12 of the TPNW, which pertains to universalization.¹³¹ TPNW proponents will continue to work to develop the treaty institutionally. A Nuclear Ban that is more universal and more verifiable will have greater appeal among governments and their publics. In the meantime, Nuclear Ban campaigners are likely to continue to use Russian nuclear threats and transgressions in their outreach efforts to educate the global public about the TPNW. Since nuclear-armed states and their allies are unlikely to budge on disarmament at the moment, one strategy that might work to gain concessions is issue linkage. A recent example of this is the Marshall Islands' successful demand for additional nuclear testing impacts compensation from the United States in exchange for continued military basing rights.¹³²

For its part, Washington still has much to do in response to the nuclear dimensions of the war in Ukraine. The rhetoric of South Korean President Yoon and public opinion polls in several allied states indicate that nuclear fears may translate into a desire for the bomb. Preventing nuclear proliferation from occurring under the umbrella will require a revitalized U.S. commitment to nonproliferation and even some flexibility in renegotiating security partnerships with allies. These pressures are likely to remain as the United States and NATO simultaneously seek to avoid a nuclear confrontation or unintended escalation with Russia.

Finally, the events that have occurred since February 2022 have firmly positioned disarmament as the dominant alternative to the nuclear status quo. The TPNW is the most prominent instrument that is part of this narrative. The policies of the nuclear status quo have led to nuclear coercion in the center of Europe, continual arsenal modernizations, and a retreat from the policies of arms control that once gave some level of credibility to the great powers' disarmament commitments under Article 6 of the NPT. The global nuclear order is not collapsing, but its inequities have become all too visible as a result of Russia's war in Ukraine. Nuclear issues may yet hamper U.S. relations with the Global South. And if the TPNW has a resurgence in appeal in Europe or Australia, this could lead to fundamental changes in the structure of U.S. defense alliances. Continuing to ignore the Nuclear Ban Treaty would be naive, as it is in the interests of the United States and its allies to recognize the motivations underlying this movement and treaty. Though near-term acceptance of the TPNW by nuclear-armed and umbrella states does not appear to be in the cards, these countries should consider ways to address the concerns raised by Nuclear Ban proponents in the Global South and beyond. Serious intra-alliance consultations and joint policymaking toward the TPNW would be wise, as would more unified observer participation at future treaty meetings.

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Wither Nuclear Risk Reduction?

Wilfred Wan

Introduction

On January 3, 2022, the leaders of the five permanent members (P5) of the United Nations (UN) Security Council—China, France, Russia, the United Kingdom, and the United States—issued a joint statement on “Preventing Nuclear War and Avoiding Arms Races.” Its release coincided with what would have been the opening week of the Tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), prior to a fourth postponement linked to the COVID-19 pandemic. The leaders of the P5, which are also the five NPT-recognized nuclear-weapon states, reaffirmed the importance of addressing nuclear threats, characterizing “reduction of strategic risks” as their “foremost responsibilities.”¹

The rare show of unity among the leaders included a multilateralization of the 1985 declaration from U.S. President Ronald Reagan and Soviet President Mikhail Gorbachev that “a nuclear war cannot be won and must never be fought.”² The statement also outlined potential steps forward in risk reduction. It expressed the leaders’ intent to strengthen national measures to address unauthorized or unintended nuclear use and committed them to seeking “diplomatic approaches to avoid military confrontations, strengthen stability and predictability, increase mutual understanding and confidence.”³ In this manner, the statement implicitly acknowledged the deteriorating strategic context and the elevated state of risk of nuclear weapon use.

Yet, potential for follow-up quickly dissipated with the Russian invasion of Ukraine on February 24, 2022. The P5 process stopped altogether. Implicit nuclear threats from Russian President Vladimir Putin and the ongoing “proxy war” between Russia and the West have heightened risk significantly.⁴ Shows of force on both sides, including large-scale military exercises and deployments involving nuclear bombers, feed into ongoing tension. In February 2023, Russia suspended its participation in the New Strategic Arms Reduction Treaty (New START), the last piece of the bilateral nuclear arms control architecture, and Moscow’s stationing of nonstrategic

nuclear weapons in Belarus in June 2023 further raised the prospects of inadvertent escalation.⁵ The accession of Finland and potentially Sweden to the North Atlantic Treaty Organization (NATO) underlines the increased significance of nuclear weapons on the European continent—and elsewhere.⁶ Is nuclear risk reduction dead?

This paper considers the question. The first section outlines risk reduction concepts and details challenges to operationalization, including in the current context. The second section makes the case for the potential of risk reduction in dark periods, revisiting its role during the Cold War and detailing the lens of strategic stability and deterrence through which it came into existence. It describes a spectrum of relevant measures. The third section reexamines these in the context of the war in Ukraine. It identifies the war's impact on nuclear risk at large, then considers how the multilateral risk reduction endeavor has been affected. The last section provides a set of recommendations for revitalizing nuclear risk reduction. It suggests that the new challenges impacting the nuclear landscape—including technological developments and a more multilateral risk environment—might help facilitate modest steps forward.

Risk Reduction Concepts and Challenges

Risk is often defined as a function of probability and consequence.⁷ The last decade of discourse on nuclear weapons policy—and nuclear disarmament in particular—has arguably been defined by that equation.⁸ But the sense of urgency on addressing the probability side increased as geopolitical relations worsened and great-power competition returned. One symptom was the stagnation in stockpile reductions that had characterized the post-Cold War period. The arms control architecture between Russia and the United States was also slowly disassembled. Meanwhile, extensive modernization programs among all nuclear-armed powers, including those outside the NPT, expanded rather than diminished the role of nuclear weapons in security strategies. In this context, the importance of reverting to a fundamental principle, that of the undesirability of any nuclear weapon detonation event, took hold.

The simple objective of nuclear risk reduction explains both its appeal and its challenges. Reducing the probability of use encompasses a spectrum of activities, extending to the ultimate form of risk reduction: complete nuclear disarmament. Barring that, risk reduction includes any number of steps that can, *inter alia*, help address the possibility for miscalculation in crises, lessen the chance of accidental detonation, and improve the safety and security of nuclear weapon stockpiles.⁹ These steps can be political, strategic, operational, and technical in nature and be

taken at national, bilateral, mini-, or multilateral levels. Many nonnuclear-weapon states have expressed understandable concern that the concept can be used to reinforce the nuclear status quo and delay disarmament indefinitely, as it suggests the existence of an “acceptable” level of risk.¹⁰ Still, reducing risk of use in strategic contexts in which the possibility of conflict among nuclear-armed and nuclear-allied states appears all too real has clear merit.

Consequently, risk reduction has permeated the agendas of numerous multilateral forums and initiatives. These include the UN Disarmament Commission and the Conference on Disarmament. Furthermore, the UN secretary-general in his 2018 *Agenda for Disarmament* underlined a need for “urgent pursuit and implementation” of concrete risk reduction measures.¹¹ The Group of Seven (G7) identified measures to avoid misunderstanding and miscalculation.¹² The Association of Southeast Asian Nations (ASEAN) Regional Forum held workshops on the topic, which also featured prominently in the review cycle leading to the Tenth NPT Review Conference in 2022.¹³ The Review Conference’s draft final document, not adopted due to Russian objections over unrelated text, would have committed nuclear-weapon states to pursue a series of risk reduction steps, including intensification of regular dialogue on doctrines and issuance of declarations of restraint.¹⁴

The number of proposals for what nuclear-armed and other states can do to reduce the risk of nuclear weapon use is voluminous, as illustrated by a batch of working papers presented at the Tenth NPT Review Conference and by work in recent years from civil society.¹⁵ Still, translating the consensus in place about the value of reducing the risk of nuclear use to concrete policy action has proven challenging. The war in Ukraine will make it only more so, especially as it will reaffirm to some the idea of nuclear weapons as the “ultimate security guarantors”—with some corresponding level of risk a small price to pay for state survival.¹⁶ But moving forward on risk reduction would be difficult in any circumstance, for several fundamental reasons.

Risk Assessment Is Subjective

Different stakeholders perceive risk sources differently. This can be true even within states—for instance, between military personnel and diplomats—and is certainly the case when considering views across them, given different state ideologies and priorities. President Putin, for example, characterized the stationing of nonstrategic nuclear warheads in neighboring Belarus as “an element of deterrence” against Western aggression, justifying the move in part by pointing to long-standing U.S. nuclear-sharing

practices in Europe: the original source of risk in his eyes.¹⁷ Yet what Putin sees (or at least portrays) as a move toward reestablishing deterrence stability has been received by the West as a clear and “irresponsible escalation [and] threat.”¹⁸

Risk Thresholds Are Variable

National and allied perspectives, priorities, and strategic cultures help determine not only how states and decision-makers identify sources of risk but weigh its acceptability and even desirability. For those in the West, Putin’s maneuver in Belarus is part of a deliberate pattern of weaponizing nuclear-related risk since the beginning of the war with an eye to preventing further Western involvement in Ukraine. This “nuclear coercion” has included purposeful threats of unprecedented consequences, a declared change to the alert status of Russian deterrent forces, and suspension of participation in New START, including its information-exchange provisions.¹⁹ And while not in the realm of nuclear weapons, the establishment of Russian troop defenses at the Zaporizhzhia Nuclear Power Plant is, some suggest, a purposeful tactic to raise the specter of a radiological event. That the West has not sought to echo this rhetoric (or tactics) suggests a different risk calculus.

Risk Is Dependent on Context

Even acknowledging inherent subjectivities in risk assessment and tolerance, risk is linked to the nuclear characteristics and immediate security environment of states. The nuclear dimension of the war in Ukraine cannot be separated from the critical role of the country in Russian foreign policy or from what Russia perceives as Western (and NATO) encroachment and aggression in Eastern Europe since the 1990s.²⁰ Reducing nuclear risk in this context requires an accounting of these aspects. Regional analysis of nuclear risk underscores that no one size fits all. This is exacerbated by the fact that risk is a moving target, subject to the unknown and yet to be determined impacts of certain technological developments, including in nuclear and nonnuclear capabilities.

All of these factors provide significant challenges to the political viability of individual risk reduction measures and, ultimately, to efforts to devise bespoke baskets of mutually reinforcing measures for relevant strategic relationships or security environments. At the same time, the severity of risk in the current context can contribute to shared concerns that drive practical cooperation. History suggests as much.

Risk Reduction in Practice

Engagement on risk reduction has distinctly bilateral origins, with the topic a “central preoccupation” for Cold War–era leaders.²¹ Unease in the Soviet Union and the United States about the possibility of inadvertent nuclear war took shape following the October 1962 Cuban missile crisis. In one episode during those infamous thirteen days, miscalculation and misunderstanding drove a Soviet submarine captain to order assembly of the onboard nuclear torpedo and consider nuclear use.²² The United States was unaware of nuclear torpedoes deployed onboard Soviet submarines, while Soviet submarines did not fully understand the U.S. Navy’s use of depth charges and hand grenades as signals to surface—the result was nearly catastrophic. The example is especially ominous given the backsliding in information exchange that has taken place because of the war in Ukraine.

Risk reduction activities pursued by the Soviet Union and the United States existed through the prism of nuclear deterrence. The two superpowers sought a notion of strategic stability in which the threat of retaliation and knowledge of unacceptable costs would create a situation wherein nuclear aggression was neither desirable nor possible on either side.²³ In resolving the Cuban missile crisis, U.S. President John F. Kennedy and Soviet Premier Nikita Khrushchev tacitly recognized the other’s hemispheric sphere of influence, agreeing privately to the verified removal of ballistic missiles (and bombers) from Cuba in exchange for U.S. withdrawal of similar systems from Turkey.²⁴ The establishment of a secure Moscow-Washington hotline in 1963 underlined a desire to avoid repeating the brinksmanship and accompanying missteps that had resulted in near nuclear war.²⁵ In the ensuing years, the United States and the Soviet Union took further action to restore and maintain deterrence and strategic stability. These efforts can provide a baseline for considering risk reduction after the events of February 24, 2022, and can be categorized as follows.

Mutual Recognition and Commitment

A prerequisite to risk reduction is mutual recognition of an unacceptable level of risk. The 1971 Soviet-U.S. Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War elaborated concern about the possibility of situations spiraling out of control, with accompanying political commitments to minimize the likelihood of worst-case scenarios coming to bear.²⁶ Similarly, the 1973 Agreement on the Prevention of Nuclear War stated the two nations’ mutual objective to “remove the danger of nuclear war and of the use of nuclear weapons.”²⁷ Significantly, both the 1971 and 1973 agreements were inward oriented, centered on each side maintaining control

over its own nuclear forces. This entailed in the 1971 agreement a pledge to take organizational and technical measures to guard against accidental or unauthorized incidents involving each nation's nuclear weapons, as well as a commitment to notify the other side should these or other unexplained incidents take place. Notifications also extended to missile launches in the direction of the adversary, as well as the detection by missile warning systems of unidentified objects or signs of potential interference, syncing to a second, more relational category of activity.

Transparency, Information Exchange, and Behavioral Restraint

Improved communication can mitigate the possibility and effects of misunderstanding, misperception, or miscalculation. The Soviet Union and the United States agreed to facilitate broad transparency around military activities, promote restraint around those vectors, and outline procedures for notification, signaling, and inquiry—looking to prevent conventional confrontations that could otherwise escalate to the nuclear sphere. The 1972 agreement on the “Prevention of Incidents on and over the High Seas” (the IncSea accord) details naval restraint, use of informative signals, and notification exchange and presented a model for other European states in their bilateral relations with the Soviet Union (and later Russia). The 1989 Agreement on the Prevention of Dangerous Military Activities (DMA) outlines procedures for when the armed forces of the superpowers are operating in geographic proximity. These were precursors to a comprehensive agreement on conventional military transparency under the Organization for Security and Co-operation in Europe: the 1990 Vienna Document—from which Russia withdrew in March 2023.²⁸ In the nuclear sphere, the Soviet Union and the United States in 1987 signed an agreement to establish nuclear risk reduction centers, which helped fulfill information exchange requirements outlined in arms control treaties.²⁹

Restrictions in Capabilities

Deterrence stability centers on “maintaining strategic forces of sufficient size and composition that a first strike cannot reduce retaliation to a level acceptable to the aggressor.”³⁰ Implicit is a requisite level of predictability and transparency about that capability. In the late 1960s, with the Soviet stockpile catching up to that of the United States, concerns about the destabilizing aspects of uninhibited arms racing helped to put arms control on the agenda.³¹ This was sparked by the development and deployment of new offensive and defensive systems that threatened to undermine deterrent capabilities while also instigating longer-term action-reaction

dynamics. The Strategic Arms Limitation Talks (SALT), which produced the 1972 Anti-Ballistic Missile (ABM) Treaty and Interim SALT Agreement and their 1979 follow-on, became the foundation for an architecture that included the 1987 Intermediate Nuclear Forces (INF) Treaty and the 1991 Strategic Arms Reduction Treaty (START) and its successors.³² Arms control would help to reduce the risk of war, the cost of preparing for war, and damage should war occur. In practice, the first objective—that is, “of reducing the risk of surprise nuclear attack”—“came to eclipse and overshadow the other two.”³³ This is notable because arms control is too often discussed as a separate entity from risk reduction in the contemporary debate.

Strategic Dialogue

The Cold War arms control agreements marked the culmination of a long series of negotiations, conferences, and summits that fostered regular dialogue between the main Cold War adversaries on broader strategic concerns. These processes allowed the Soviet Union and the United States to sit and essentially outline parameters for strategic stability, including by discussing conceptualizations and definitions of strategic systems.³⁴ As during the years-long SALT processes, subsequent rounds of talks would help narrow the scope of potential agreements, centering on ceilings for different systems and potential geographic limitations on deployment. While negotiators did not always come to common understandings on all aspects, these discussions constituted efforts to exchange and recognize each side’s perspectives, priorities, and concerns—the process being a risk reduction measure in its own right.

Beyond the Cold War

Risk reduction activities have not been limited to the prism of the Cold War deterrence relationship and the framing of strategic stability. Potential terrorist use of nuclear weapons became a concern for the international community in the post-Cold War era, as the collapse of the Soviet Union raised questions about stockpile and materials control. Calls for action intensified following the attacks of September 11, 2001, and then with the uncovering of the A.Q. Khan network in 2004, which revealed the wide reach of the nuclear black market.³⁵ States seeking to address stockpile and material safety have done so with an eye to reducing the risk of unauthorized nuclear use. Still, prominent activities in this area—including the Cooperative Threat Reduction program, the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, and the Plutonium

Management and Disposition Agreement—suffered following the 2014 Russian annexation of Crimea.

Nuclear risk reduction has also featured in relationships beyond those of the great powers. India and Pakistan signed an agreement on the topic in 2007, with each side pledging to enact national measures “to guard against accidents related to nuclear weapons under its control” while committing to notify the other should these take place, echoing the 1971 and 1973 U.S.-Soviet agreements.³⁶ The measure also called on parties to make use of existing hotline links between their foreign secretaries and directors general of military operations. While restrictions on capabilities are conspicuously absent, the India-Pakistan relationship has produced other risk reduction measures. The 1988 Agreement on the Prohibition of Attack against Nuclear Installations and Facilities, which predates the nuclear weapons age in the region, includes an annual exchange of lists that promotes military restraint and transparency.³⁷ The 1999 Lahore Declaration compelled each side to take steps to address accidental or unauthorized nuclear use, including through discussion of concepts and doctrines.³⁸ It also drove ministerial and expert dialogue in the years that followed, leading to the 2005 Agreement on Pre-Notification of Flight Testing of Ballistic Missiles and, in 2006, bilateral nuclear doctrine consultations.³⁹

The Post–February 24, 2022, Landscape

The Russian invasion of Ukraine and subsequent events have had profound implications across the nuclear landscape. This is not only because a nuclear weapon state violated the sovereignty of a nonnuclear-weapon state but also because, in doing so, Russia discarded the explicit security guarantees it (along with the United Kingdom and the United States) had offered to Ukraine in the 1994 Budapest Memorandum. The war has caused the recalibration of risk assessments in several states, with policymakers weighing the risks of relying on nuclear deterrence against perceived existential threats posed by adversarial nuclear powers in their backyards. Finland swiftly entered the nuclear umbrella provided by NATO, while Sweden seeks the same. Domestic debates have reignited in Japan and South Korea about the possibility of nuclear-sharing arrangements or, in the case of the latter, an indigenous nuclear weapons program.⁴⁰ Effects on the global nuclear order are still to be determined.⁴¹

Further, the possibility of nuclear escalation between Russia and the West has been ever present since the beginning of the conflict. Purposeful maneuvers from both sides have raised the specter of use as a means to achieve specific objectives (Russia to deter deeper Western engagement, the West to deter further Russian aggression). This includes demonstration

activity, including Russian operations near the borders of NATO-member Poland, changes on both sides in the flight patterns of nuclear-capable bombers, and the involvement of those bombers in military exercises as shows of force.⁴² President Putin and other senior Russian officials have made headlines with implicit threats of nuclear use, and Putin in February 2022 ordered Russian deterrent forces to be put on “special combat readiness”—though observers have found no indications that would suggest operational readiness of Russia’s nonstrategic nuclear weapons.⁴³

Still, the prolongation of the Ukraine war—and the potential expansion of operations—poses escalation risks. This is especially the case with Finland joining NATO and Russia placing nuclear weapons in Belarus, actions that drastically expand the frontlines between Russia and the West. Some experts have presented scenarios in which Russia may feel pressure to carry through its nuclear threats if it continues to struggle in achieving its battlefield or deterrence objectives.⁴⁴ In such circumstances, the West may feel equally compelled to take preemptive action. Fundamentally, the European security landscape is being reformulated, including in its nuclear aspects.

Russia’s war in Ukraine has thus compounded nuclear risk. Moreover, the chain of actions it set off has directly hindered the risk reduction agenda across all aforementioned categories of activity.

Nuclear saber-rattling by Russia has fractured the mutual recognition of risk and commitment to reducing it, exemplified by the January 2022 “Joint Statement of the Leaders of the Five Nuclear-Weapon States.” General recognition of nuclear risk might still exist at some level. The November 2022 “G20 Bali Leaders’ Declaration” observed that “the use or threat of use of nuclear weapons is inadmissible.”⁴⁵ Still, the possibility of practical bilateral or multilateral risk reduction activity is significantly hampered without the involvement of Russia, the state with the largest stockpile. The present conditions evoke the pause in multilateral engagement on nuclear security issues post-2014. Additionally concerning is that Putin’s rhetoric is part of a larger trend toward provocative language and threats involving nuclear weapons, including under U.S. President Donald Trump. The normalization of nuclear threats is antithetical to mutual recognition and commitments surrounding the unacceptability of risk. Notably, the TPNW explicitly bans use threats, and its First Meeting of States Parties in June 2022 agreed to “condemn unequivocally any and all nuclear threats, whether they be explicit or implicit.”⁴⁶

While Russia and the United States implement limited confidence-building measures, there has been a general backsliding in transparency, information exchange, and behavioral restraint. Shortly after the war began, the two sides established a military communications link (a

deconfliction line) to exchange information on military operations and avoid misunderstanding; this follows an on-the-ground precedent set during the Syrian Civil War. Both sides also initially continued to notify each other of planned intercontinental ballistic missile tests, in accordance with their New START obligations. However, as the war continued, Russia refused the U.S. request to restart on-site inspections linked to that treaty (inspections had been put on hold due to COVID-19) and in February 2023 ultimately suspended its participation in the agreement—pausing information exchange on stockpiles as well, though continuing to notify on launches of intercontinental and submarine-launched ballistic missiles. The United States, while engaging in some unilateral transparency attempts, has also taken countermeasures that include the withholding of its biannual data update on treaty-accountable facilities and forces.⁴⁷

Even as Russia announced the New START suspension, its Ministry of Foreign Affairs (MFA) clarified that it would continue to comply with the numerical limitations on warheads and delivery systems set by the treaty.⁴⁸ Still, suspension of the treaty and the ongoing war in Ukraine provide clear obstacles to maintaining the arms control framework, with New START already the last agreement in place that sets verifiable limits on the size and composition of global nuclear arsenals. There will soon be no restrictions on capabilities. The United States has declared the resumption of inspections to be a prerequisite to discussions of a follow-on treaty.⁴⁹ With scant movement in this direction—a Russian MFA spokesperson had previously called for the United States to create the conditions in 2023 for a meeting of the bilateral consultative commission (the body established to address New START compliance and implementation concerns)—the 2026 expiration date for the treaty looms.⁵⁰

The Russia-U.S. bilateral strategic stability dialogue to establish a foundation for “future arms control and risk reduction measures” was paused by U.S. President Joseph Biden following the onset of the Ukraine war.⁵¹ Russia and the United States had established two interagency expert working groups—on “Principles and Objectives for Future Arms Control” and “Capabilities and Actions with Strategic Effects”—that still have not met.⁵² Officials from both states have suggested a willingness to delink the war in Ukraine from such discussions. President Biden, for instance, while calling for Russia to be held accountable for the war also underlined the need to “engage Russia on issues of strategic stability.”⁵³ Some Russian officials, including President Putin, have said the same at times.⁵⁴ Yet Russian Foreign Minister Sergey Lavrov has also said that it is “impossible to discuss strategic stability” so long as the West seeks to destroy Russia.⁵⁵ Little movement has been seen across all venues.

The Ukraine war will enhance risks and/or affect global efforts to combat nuclear risk in other ways too. Some nonnuclear-weapon states have responded by looking for firmer extended deterrence commitments from their allies, as in South Korea's agreement with the United States in April 2023 on nuclear planning and patrols by U.S. ballistic missile-equipped submarines.⁵⁶ How Finland's and Sweden's accession to NATO impact their priorities, including on disarmament and risk reduction efforts (Sweden presently leads the Stockholm Initiative on Nuclear Disarmament), is yet to be determined. The war will also have implications in the context of nuclear security, a long-standing challenge in the Black Sea region. The possibility of nuclear smuggling and access to radiological materials by terrorist groups (and the potential for nuclear terrorism)—linked to issues of inadequate oversight, physical protection, accounting and control, theft, and corruption—is prominent in the region.⁵⁷ The Ukraine war has made such challenges more acute while curbing the already limited cooperation between Russia and the United States on these issues.⁵⁸

Recommendations to Take Risk Reduction Forward

Russia's invasion of Ukraine effectively forestalled nuclear risk reduction efforts and revealed the fragility of the concept that underlines the essential role that all nuclear-armed states, but particularly the United States and Russia, have to play in advancing the endeavor. The war is also a blunt reminder that the geopolitical landscape that drove increased attention on the topic stands as a challenge to operationalizing it. And as the war carries on, it underlines the risk inherent in the continued reliance on deterrence logic. The possibility of nuclear use linked to the war remains ever present. Yet none of this should discourage risk reduction efforts in that context or elsewhere. As during the Cuban missile crisis, risk reduction is most essential when nuclear risk is at its highest. This section provides recommendations for the way ahead.

1. Expand the Approach

Multilateral dialogue on risk reduction has focused on the same types of activities that the superpowers saw as contributing to strategic stability during the Cold War. But the risk picture has become more complex. Notions of deterrence and strategic stability are more difficult to settle (let alone practice), with the presence of more nuclear-armed states than during the Cold War and the conventional capabilities and behaviors of a greater number of states potentially impacting on escalatory dynamics. The war in Ukraine underlines this. The doctrines, strategies, and postures of nuclear-armed

states make clear that the character of deterrence is evolving rapidly. The 2022 U.S. National Security Strategy and Nuclear Posture Review points to complicating escalation dynamics as “creating new challenges for strategic stability.”⁵⁹ France and the United Kingdom in recent security documents similarly recognize the potential for a wider range of escalatory pathways.⁶⁰ Simply put, there are more ways for deterrence to fail.

In decades past, the Soviet Union and the United States (and India and Pakistan too) recognized that developments outside the nuclear space could impact on the nuclear realm. Consequently, they looked to enhance broader military transparency. Adapting the principle to the contemporary landscape requires looking beyond the modalities that characterized those bilateral frameworks. A more expansive approach to dangerous military activity requires revisiting what it means for forces to “operate in proximity” given new domains of warfare, notably in cyberspace and in outer space. The increased presence of paramilitary forces on the battlefield, as in Ukraine, and greater reliance on nonnaval maritime law enforcement agencies in the East and South China Seas necessitate a reconsideration of how a force is defined.⁶¹ States could also look to adapt or expand mechanisms like the Russia-U.S. deconfliction hotline for other contexts. With inadvertent escalation a unifying concern on some level, risk reduction activities in this vein should be more multifaceted and multidomain.

2. Address Technological Concerns

The more complex nature of deterrence is largely tethered to technological advancements that encompass nonnuclear capabilities. These can undermine nuclear deterrence in several ways, including by threatening missile and space systems, targeting early warning and nuclear command, control, and communications, and effectively tracking nuclear forces.⁶² The deployment of systems like the U.S. W76-2 low-yield submarine-launched ballistic missile warhead or the Russian Poseidon uncrewed nuclear-capable underwater drone have fed into threat perceptions on both sides. Much has also been made of the potentially destabilizing impacts of hypersonic missiles or cyber operations. While these have featured in Ukraine with seemingly minimal impact, they reflect greater asymmetries in capabilities and an expanded battlefield. This can present fundamental challenges for traditional approaches that center on quantitative rather than qualitative strategies.⁶³

Risk reduction efforts must key in on new modalities in pursuit of restraint, including normative and behavioral. This should not preclude redoubled efforts to resume New START implementation and to discuss a follow-on treaty. But stakeholders can plug into conversations elsewhere—

for instance, by using the debate on critical infrastructure in cyberspace as a gateway to discussing nuclear escalation concerns. The initial 2023 U.S. declaration on military use of artificial intelligence includes a best practice on “maintaining human control and involvement for actions critical to informing and executing sovereign decisions concerning nuclear weapons employment”; however, this has been removed from more recent versions.⁶⁴ Still, increased interest on the AI-nuclear nexus can inspire necessary discussions about which actions are considered critical or what control entails. Concurrently, states should extend existing nuclear-oriented instruments; for example, by updating commitments on avoiding nuclear war to include cyber scenarios, expanding missile launch notification systems to include space activities, or exchanging information on uncrewed assets. Connecting in both directions will prevent shifting deterrence and escalatory realities from outstripping thinking on nuclear risk reduction.

3. Ensure Inclusive Dialogue

Nuclear-armed states remain the key actors in risk reduction efforts, but an expanded pool of actors can also spark escalatory dynamics. Some nonnuclear-weapon states are investing in or developing ballistic missiles, submarine technologies, counterspace capabilities, cyber operations, and automated systems. Each of these has strategic implications, especially as many of the involved states are NATO members or under the extended deterrence umbrella of the United States. For instance, referencing a leaked intelligence document, a recent media report notes that the United States had assessed that China had developed capabilities to “hold key U.S. and Allied space assets at risk,” while elsewhere suggesting that China would likely “destroy ballistic missile early warning satellites” in a conflict with Taiwan.⁶⁵ If nuclear-armed states are considering the capabilities and activities of nonnuclear-weapon states in use scenarios, nuclear risk reduction efforts must do so too.

Expanding the conversation can take different forms. The pre-February 2022 limited cross-grouping engagement between the P5, the Non-Proliferation and Disarmament Initiative, and the Stockholm Initiative states could be extended. The Creating an Environment for Nuclear Disarmament initiative, especially valuable with the participation of India, Israel, and Pakistan, has working groups examining the twin topics of nuclear risk reduction and emerging technologies—albeit separately. Another way forward would be to formalize risk reduction on the NPT agenda in a main committee or working group. A comprehensive multilateral treatment of risk reduction would also be useful. A dedicated process—for example, a group of governmental experts, an open-ended working group,

or an international conference—would have symbolic value and mark a definitive shift to an inclusive multilateral approach toward risk reduction. Moreover, states should take national action to engage the private sector and industry, especially as these parties are driving advancement across technological fields. This can lay a foundation for further cross-sectoral engagement.

4. Intensify Engagement with China

In recent years, the United States has clamored for China to engage in arms control negotiations, with the Trump and Biden administrations expressing concern about the pace and scale of China's stockpile growth and its potential shift away from a policy of minimal nuclear deterrence.⁶⁶ While China has denied claims of a significant buildup, it is critical that the state with the third-largest arsenal take a more prominent role in the risk reduction conversation. Its lack of involvement in a more operational framework is striking. In 2007, China established a direct hotline with the United States, and in 2017 it entered into bilateral memorandums of understanding regarding rules of behavior for air and maritime encounters while also agreeing to a joint strategic dialogue mechanism to improve military communication. Yet these are of a nonbinding and voluntary nature, and questions persist about their implementation.

China's prioritization of its sovereignty and security cannot be expected to change. But China and the United States could explore means for crisis prevention in service of avoiding inadvertent escalation. This includes ensuring the upkeep of existing memorandums and using agreed-upon tools, such as reciprocal observations of military exercises and annual consultations. Existing texts can provide a foundation for developing new mechanisms. Chinese scholars have previously suggested elaboration of notification procedures.⁶⁷ Such engagement can help chip away at the trust deficit in the bilateral relationship. Incorporating China into the risk reduction conversation should also extend beyond the United States and center on other configurations of states and topics. For instance, China joined the 2014 Code for Unplanned Encounters at Sea, which, while lacking legal status, constitutes a key maritime confidence- and security-building measure. Such a normative approach in domains of interest to China may pay dividends. The Arctic could provide a next, lower-stakes, locale. Notably, France, the United Kingdom, and the United States may want to reconsider the "responsible custodians of nuclear weapons" framing they introduced in a working paper at the Tenth NPT Review Conference.⁶⁸ Such a clear delineation between them and ostracized, "irresponsible" nuclear-armed states may close off the possibility of constructive engagement with China, which

in August 2023 submitted its own working paper on “nuclear risk reduction” at the Preparatory Committee for the 2026 NPT Review Conference.⁶⁹

5. Strengthen Regional Perspectives

Intimately linked to the war in Ukraine but also important on its own merits, there is great value to considering issues of nuclear risk through regional and subregional frameworks. Experts have long acknowledged that regional crisis scenarios could spark military conflict and potential nuclear escalation.⁷⁰ Among the great powers, Russia has reportedly warned the United States that it would be willing to use nuclear weapons in a war in the Baltics.⁷¹ The United States has elaborated its belief that China could use nuclear weapons to end a conflict in Taiwan.⁷² The United States continues to bolster its nuclear triad with an eye to strengthening regional deterrence.⁷³ Existing regional institutional frameworks and alliances have a key role to play in bringing forward risk reduction by addressing destabilizing local factors. Australia and the Philippines have introduced the discussion to the ASEAN Regional Forum. Such venues can help to concretize nuclear risk reduction for nonnuclear-weapon states. The topic can foster useful exchange on regional security dilemmas and escalatory dynamics and can also launch practical action, with member states identifying points of contact on topics of concern, organizing focused workshops and tabletop exercises, and exchanging best practices. The nuclear risk reduction framing can help foster more systematic risk assessment, serving as a conduit to improve security contexts; it also follows in the footsteps of nuclear-weapon free zones, which have become a model for disseminating nonproliferation and disarmament norms.

6. Identify Benchmarks

Momentum on the topic of risk reduction can be easily blunted, as demonstrated since the Russian invasion of Ukraine in 2022. There is a real danger that the challenges to operationalizing risk reduction can reduce political support for the topic to background noise, consigning it to the dustbin of history. The responsibility rests with stakeholders to move toward clear benchmarks and timelines for implementation. While parallel tracks are necessary and will continue to exist, a cross-cutting discussion that coalesces on selected focal points can propel concrete action. This is true even in the current context. The NPT review process presents a natural starting point for promoting accountability. Indeed, the draft text circulated in the room during the last week of the Tenth Review Conference presented one means of measuring progress on risk reduction measures,

centered on a standard national reporting mechanism and accessible repository first detailed in Action 21 of the 2010 NPT Review Conference final document.⁷⁴ While parties did not adopt the document by consensus, in light of the “consensus minus one” that was achieved, four of the five NPT nuclear-weapon states could still look to carry this through. However, with the prominent nuclear-armed states outside the treaty, benchmarks will also need to be discussed elsewhere. A dedicated risk reduction forum could bolster such efforts.

Conclusion

Nuclear risk reduction should not be considered an alternative to traditional arms control, nor to nonproliferation and disarmament. Reducing the risk of nuclear weapon use is the foundational principle that underlies all the above, and a focus only on risk reduction at the expense of others will in the long run inhibit any movement toward a more secure world, one free of nuclear weapons. But with Russia’s war in Ukraine bringing renewed prominence to nuclear weapons and President Putin regularly invoking the specter of nuclear escalation, the promise of risk reduction as a pragmatic way forward appears even more significant. To fulfill that promise, policymakers and experts will need to take from and expand beyond the Cold War thinking that has heretofore characterized the discussion. In particular, they will need to untether risk reduction from bilateral notions of strategic stability and deterrence stability, notions that appear increasingly elusive and anachronistic.

In the short term, the most likely course for concrete, practical, and measurable action will come unilaterally or from like-minded states. Progress even on these fronts will be contingent on strategic relations. But, as with the origins of risk reduction, such actions can focus on maintaining control of nuclear forces and preventing accidents in light of new technologies and capabilities; for instance, centering on the greater role of automation and increased digitalization of nuclear systems. They can involve internal coordination with allies or regional groups on risk assessments and risk thresholds, allowing more effective and predictable signaling and reducing the likelihood of external misperception. To the degree that bilateral or multilateral engagement between adversarial states remains possible, avoiding inadvertent escalation can still constitute a driving force. But measures here will require greater creativity and cross-pollination to reflect today’s more complex world. Any degree of progress on these aspects can contribute to the kind of trust and confidence necessary to bolster the full range of risk reduction measures outlined in this paper.

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A Turn to Nuclear Counterproliferation: Consequences of a Deteriorating Nonproliferation Regime

Doreen Horschig

Is the global nuclear order beginning to unravel? Nuclear qualitative refinement and quantitative buildup have characterized recent developments in nuclear and ambitious nonnuclear states. Still, some observers point to the war in Ukraine as confirmation of the traditional nonproliferation regime's resilience.¹ Others are less optimistic. They note the dwindling of Cold War arms control measures; growing nuclear ambitions in South Korea, Iran, and Saudi Arabia; and efforts on the part of Russia and China to change the rules of the international order. Recent remarks on possible nuclear proliferation have intensified worries, however. Saudi Minister of Foreign Affairs Prince Faisal bin Farhan Al-Saud prominently stated in 2022 that, "if Iran gets an operational nuclear weapon, all bets are off,"² and South Korean President Yoon Suk Yeol stated in early 2023 that Seoul "will introduce tactical nuclear weapons or build them" if North Korea's nuclear threat grows.³ Proliferation concerns, tensions, and nearly two decades of stalled progress on nuclear arms control suggest that these traditional nonproliferation strategies have been weakened.

Where these strategies—including treaties, International Atomic Energy Agency (IAEA) safeguarding, and normative restraints—have had limited success, a vacuum to prevent proliferation has emerged. That is concerning because, as some argue, Russia's invasion of Ukraine could trigger nuclear proliferation.⁴ At the Tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), U.S. Secretary of State Antony Blinken stated that Russia's behavior sends "the worst possible message to any country around the world that may think that it needs to have nuclear weapons to protect, to defend, to deter aggression against its sovereignty and independence."⁵ Countries with latent nuclear capabilities and that have entertained the idea of an independent nuclear program are on the receiving end of this message.⁶

Fortunately, the Ukraine war might not trigger a proliferation cascade. Some argue that the outlook for further proliferation does not appear as pessimistic and that it might even strengthen U.S. nonproliferation efforts

rather than ignite a cascade of new nuclear weapon states.⁷ Washington's nonnuclear European allies are unlikely to pursue their own nuclear weapons programs. The U.S. security umbrella is more important than ever to these states, and an independent nuclear deterrent would not be of interest to the alliances. History has also shown that when a nuclear power threatens a weak state, as is the case in Ukraine, this does not automatically lead to proliferation. In addition, acquiring nuclear weapons is incredibly difficult, as it requires tremendous resources and causes resentment from the international community.

Despite the debate over the effect of the war in Ukraine on proliferation, the traditional nonproliferation regime has been challenged in the past few years—as another publication in this arms control series elucidates.⁸ In this paper, I discuss one consequence of a deteriorating nonproliferation regime and an alternative to the traditional arms control approach: counterproliferation. Counterproliferation here expands on Fuhrmann and Kreps's work and is defined as the state-sanctioned use of force against materials, commodities, personnel, or infrastructure related to a nuclear weapons program that displays both a covert nature and strategic intent and employs nontraditional warfare.⁹ This can include limited military strikes, cyberstrikes, electronic warfare, assassinations, or sabotage to prevent or delay another country's acquisition of nuclear bombs or its modernization of a nuclear program. This third option, or *tertia optio*, in the foreign policy toolbox is used when the first option, diplomacy, is ineffective and the second option, war, seems unwise. In line with Fuhrmann and Kreps, this paper excludes *financial and economic sanctions* from its definition of counterproliferation and focuses instead on the use of preventive force. Counterproliferation measures are often seen to complement coercive diplomacy by buying time for other punishment efforts to take effect, thus signaling resolve and managing escalation.¹⁰ This paper treats counterproliferation as a unilateral tool to prevent proliferation that countries might fall back to in the absence of diplomacy and a nonproliferation regime or doubt about the effectiveness of them.

I explore whether states resort to this third option when the failure of nonproliferation and arms control negotiations risks the second option, war. When do states resort to counterproliferation as an alternative or complement to traditional arms control, nonproliferation, and risk reduction to hinder quantitative and curb qualitative nuclear developments? I examine counterproliferation as a tool both to prevent new states from proliferating and to control nuclear buildup in existing nuclear states.

Concerns over nuclear proliferation are plausible—given the Russia-Ukraine war and an increasingly multipolar world in which different countries and models of government must compete for power and

influence amid reemerging forces of fascism, authoritarianism, and imperialism—but should not be inflated.¹¹ That threatened states may now consider proliferation given the war in Ukraine is in line with predictions made by proponents of security-driven rationales for proliferation.¹² I examine current actors who are at risk of proliferating or who might use counterproliferation tools and find them to be useful. In contrast to the contributions by Rebecca Davis Gibbons, Stephen Herzog, and Wilfred Wan in this publication that explore two alternative paths to arms control and nonproliferation, this paper examines why these diplomatic paths are crucial in the first place. Some states might resort to counterproliferation as a more hawkish alternative. I investigate with open-source material whether counterproliferation activity has increased since the advent of the atomic bomb. My findings suggest that no major expansion in military action has occurred but that a premature trend toward such action can be discerned.

Counterproliferation operations are not yet a common tool to prevent proliferation. Nonetheless, several cases hint at increased covert activities. I identify these empirical examples that require attentive observation, and provide a brief quantitative evaluation of the trend in counterproliferation cases and an explanation of the risks of increased counterproliferation and the implications for the nonproliferation regime. I end the paper with recommendations for practitioners.

Academics and policy analysts alike have written plenty on the limitations of the nonproliferation regime, but few have explored what that means for state behavior when faced with opponents or allies interested in nuclear proliferation. This paper adds to efforts to close this gap by exploring whether states resort to counterproliferation strategies instead of pursuing more traditional paths of negotiations and extended deterrence. I explain why a turn to preventive force would likely increase the risk of escalation between countries. Premeditated attacks often violate sovereign rights and are seen as aggression—possibly even counterproductively incentivizing state proliferation. Those who were proliferating before because of security concerns might now be more interested in obtaining an independent deterrent in response to an adversary's attack. The list of countries of concern—those that might proliferate or use military operations to prevent such proliferation—could grow. Policymakers should be looking for ways to disincentivize these destabilizing and dangerous military measures. The key policy recommendation of this paper is to preserve and build on traditional means of preventing proliferation without encouraging military measures. Current actors should be wary not only of the risk of additional nuclear powers but of the increased tensions that come from trying to prevent nuclearization through counterproliferation. This is a troubling state of affairs, with serious consequences for the risk of escalation.

Traditional Nonproliferation Tools

Traditionally, the global nonproliferation regime has used tools such as treaties, export controls, technology restrictions, and international safeguards to prevent countries from proliferating.¹³ The most well-known effort was the signing of the NPT in 1968. In its first fifty years, the treaty created some of the broader political context and moral pressure that led to the reduction of nuclear weapons. While the treaty did not prevent all non-nuclear states from obtaining nuclear weapons, the number of proliferators might have been much higher without the NPT. In addition to creating a widely accepted norm against nuclear weapons, the NPT's comprehensive safeguards agreements (CSAs), implemented by the IAEA, have made nuclear inspections and safeguards a standard of moral state behavior. Furthermore, the IAEA's "Additional Protocol" is an aspirational standard that provides more tools to verify the peaceful use of nuclear materials.¹⁴

However, the emerging multipolarity of the global nuclear order might present a significant test to the durability of the nonproliferation regime. The four salient elements that contributed to the NPT's success—widespread membership, adaptability, enforcement, and fairness—are under scrutiny by a new order.¹⁵ The five nuclear states—China, France, Russia, the United Kingdom, and the United States (the P5)—were supposed to make "good faith" efforts to reduce and ultimately eliminate their nuclear arsenals. The NPT has been unsuccessful in enforcing this provision, which has created a rift among NPT members over the pace of disarmament, thus establishing the foundation for the Treaty on the Prohibition of Nuclear Weapons (TPNW) that bans the use, possession, testing, and transfer of nuclear weapons. The NPT also did not prevent proliferation in states such as India, Pakistan, Israel, and North Korea. The long-term prospect of the global nuclear order under the NPT regime depends on some level of buy-in from the great powers, including China and Russia.¹⁶ While the TPNW reiterates the norm against nuclear weapons, the effort has its limitations and is not curbing existing nuclear programs. States under nuclear umbrellas are not signing onto the treaty. In fact, despite a growing list of signatories, the TPNW has been widely condemned by nuclear-armed states and their allies.¹⁷

As the stress on the nonproliferation regime has become more visible, some have questioned the efficacy of the traditional approach and expressed grievances about the justice of nonproliferation enforcement, which arguably manages the status quo in the interests of the nuclear weapon states.¹⁸ This is not to say that the nonproliferation regime has been or is ineffective. Quite the opposite: few countries have proliferated, nuclear weapons have not been used to attack another country since 1945, and the number of

nuclear warheads has been greatly reduced. Rather, progress seems to be stalling, especially with the waning of U.S. global influence. For decades, Washington used various tools, such as diplomacy, positive inducement, and coercion, to painstakingly build the nuclear nonproliferation regime and get states to adhere to it.¹⁹

In addition to the formal agreements, extended deterrence is an extension of this traditional nonproliferation and arms control approach—the commitment to deter and, if necessary, to respond across the spectrum of potential nuclear and nonnuclear scenarios in defense of allies and partners.²⁰ This includes the U.S. nuclear umbrella over South Korea, Japan, and Australia, as well as the North Atlantic Treaty Organization’s (NATO) defense commitment to Canada and numerous European countries. Given the geopolitical tensions in several regions, some argue that the risk of allied proliferation is growing.²¹ Others downplay such worries by claiming that the war in Ukraine increases allies’ need for security alliances, thus forestalling efforts to pursue nuclear programs independently.²² While allies might be worried about their security and the credibility of U.S. commitments to their defense, in Europe at least, the United States and NATO have signaled their commitment to allies and partners since the beginning of the Ukraine war. This commitment to a credible nuclear umbrella for allies, however, can also undercut efforts to reduce the role of nuclear weapons or even to cap the U.S. nuclear arsenal in accordance with its NPT obligation.

Credible, extended nuclear security guarantees can also backfire when clients fear that their guarantors will drag them into nuclear conflict.²³ Further, when such guarantees are not credible, support for proliferation in countries under extended deterrence will be high, and they may feel empowered by the nuclear umbrella to consider sheltered pursuit of nuclear weapons.²⁴ Weak states under extended deterrence are more vulnerable to counterproliferation and therefore tend to be deterred from pursuing independent proliferation. However, strong protégé states under a nuclear umbrella are better able to shield themselves from such threats and are therefore more likely to nuclearize.²⁵

Extended deterrence commitments can also highlight the inability of norm-enforcing measures, including the NPT, to prevent nuclear proliferation. South Korea, for example, received security assurances from its defense partner, the United States, when Seoul merely threatened to acquire nuclear weapons.²⁶ In a joint declaration released in April 2023 (i.e., the “Washington Declaration”), the United States signaled its commitment to South Korea, including through “the upcoming visit of a U.S. nuclear ballistic missile submarine to the ROK” and the establishment of a new Nuclear Consultative Group (NCG) that, similar to the NATO Nuclear Planning Group, intends “to strengthen extended deterrence, discuss nuclear

and strategic planning, and manage the threat to the non-proliferation regime.”²⁷ Allies and partners are increasingly likely to seek greater protection from Washington by toying with a pursuit of the bomb to shore up security commitments.²⁸ Thus, the NPT is not as important as coercive bargaining to thwart a latent nuclear country’s proliferation interests.²⁹

Lastly, economic sanctions are another tool to punish countries that attempt nuclear proliferation. Sanctions have succeeded in deterring states from starting nuclear weapons programs.³⁰ However, they have not been effective in stopping active nuclear weapons programs.³¹ Dozens of United Nations (UN) Security Council resolutions sanctioning North Korea and Iran have failed to halt those countries’ accelerating nuclear programs. The reimposed sanctions on Iran in 2018 had a reverse effect, causing Tehran to accelerate its nuclear program by enriching uranium to levels that breached the limits put in place by the Joint Comprehensive Plan of Action (JCPOA). While the effectiveness of economic and financial sanctions warrants a wider discussion, neither nonproliferation nor sanctions have been fully successful in halting the spread of nuclear weapons.

An alternative tool to the nonproliferation and sanctions regime is the use of military action to counter proliferation. New technologies and open-access information have lowered the entry barriers to a range of weapons systems that can be used for counterproliferation (including explosives, cyber weapons, low-tech drones, and guns assisted by artificial intelligence), simplifying efforts to conduct such operations.

Preventing Horizontal Proliferation

Horizontal proliferation describes the building of nuclear weapons in the traditionally understood manner. The term refers to states that do not have nuclear weapons but are seemingly acquiring or developing the capability and materials for their production. Proliferating states to watch closely include those with latent nuclear capabilities and heightened external security threats.³² Russia’s war against Ukraine has emphasized to these states that the global nuclear order can be a self-serving security hierarchy characterized by nuclear injustice.³³ The nonnuclear states affected by this injustice might flirt more than ever with Kenneth Waltz’s notion that possessing one’s own nuclear weapons can preserve peace.³⁴ Taking his argument that more nuclear powers means more stability due to the vigor of nuclear deterrence, nonnuclear countries might be enticed to proliferate. Some observers argue that the Russia-Ukraine war is indicative that nuclear deterrence is working.³⁵ Out of fear of direct NATO involvement and nuclear use, Russia refrained from attacking NATO territory—including targets such as supply depots and logistics support. This logic seems to

hold true for NATO as well, which has avoided direct involvement on the ground in Ukraine—likely because of Russian President Vladimir Putin’s nuclear threats.³⁶

The Russia-Ukraine war suggests that nuclear proliferation and counterproliferation are two areas that warrant increased attention. First, if an argument can be made in favor of deterrence and nuclear weapons amid the war, countries with latent nuclear capabilities might choose to advance efforts to obtain their own nuclear deterrents rather than continue to rely on an extended deterrence regime with credibility issues. Nuclear deterrence *has* limited the escalation of the conflict in profound ways. Thus, some nonnuclear countries might seek a nuclear program for strategic stability if they perceive nuclear deterrence to have been a potent factor in Ukraine. Second, to avoid the dilemma of not being able to attack military targets (because those targets are in countries that possess nuclear weapons), some would-be antagonist states might see counterproliferation operations as an enticing means of preserving their own flexibility of movement. Following Russia’s example, states might want to prevent new nuclear actors as a way of keeping open the option of military confrontation. Other states that use covert counterproliferation operations might not want additional nuclear players in the global order because the accidental use of nuclear weapons and the risk of conventional, minor, and indirect conflicts increase with the number of nuclear states—also known as the stability-instability paradox.³⁷

Middle East

Among the latent nuclear countries, Iran has been the most prominent proliferator, in part due to the absence of effective measures to halt or reverse its expanding nuclear enrichment program since the U.S. withdrawal from the JCPOA in 2018. A mutual return to compliance no longer seems feasible, and negotiations to stabilize the current nuclear crisis have stalled. An April 2023 letter to U.S. President Joseph Biden from prominent nuclear experts urged the administration to pursue a new diplomatic strategy.³⁸ The reimposition of sanctions in 2018 led to the revival and expansion of Iran’s nuclear activities. Efforts to halt the Iranian nuclear program with conventional tools such as diplomacy, negotiations, and sanctions have reached a stalemate.

Counterproliferation operations have sometimes been used when diplomatic efforts fell short. Israel’s alleged counterproliferation strategy, which aims to prevent the nuclearization of Iran, represents the most prominent case of covert activities of this nature. Israeli officials have confirmed numerous times that the nation will not accept a nuclear-armed

Iran. In August 2022, former Prime Minister Naftali Bennett stated that Israel “will utilize all available tools to prevent the Iranian nuclear program from advancing,” and, in February 2023, Israeli Defense Minister Yoav Gallant reiterated at the Munich Security Conference that “when we [Israel] speak of preventing Iran from gaining a nuclear weapon, we must keep all the possible means—I repeat, all possible means—on the table.”³⁹ The United States has also signaled its willingness to go beyond diplomatic means to prevent a nuclear Iran, stating it would “*never* allow Iran to acquire a nuclear weapon.”⁴⁰ The strong rhetoric has been bolstered by an increase in military action in the region.

Israel has allegedly engaged in counterproliferation through cyberattacks, sabotage, and assassinations since 2007.⁴¹ Some of the more prominent attacks include the assassination of senior nuclear scientists Majid Shahriari and Fereydoon Abbasi-Davani (in 2010), Mostafa Ahmadi Roshan (in 2012), and Mohsen Fakhrizadeh, “father” of Iran’s nuclear weapons project (in 2020); the sabotage of the Bid Kaneh and Natanz missile facilities; and a cyberattack using Stuxnet, a malicious computer worm, to destroy centrifuges used for uranium enrichment.⁴² The Mossad, Israel’s intelligence service, has a tradition of assassinating nuclear scientists who are important to the Iranian nuclear program as a way to spread fear among those who remain alive.⁴³ More recently, Israel has allegedly used drones to attack military sites that develop nuclear technology, including in a June 23, 2021, attack on the Iran Centrifuge Technology Company near the city of Karaj, a strike on May 25, 2022, on the Parchin military complex, and dual January 28, 2023, strikes aimed at pro-Iranian militant groups in Syria and an Iranian military site in the city of Isfahan, home to one of Iran’s largest nuclear research centers.

Other incidents, such as the assassination of Roshan in 2012 and the 2020 sabotage of the Khojir missile facility are not with full confidence attributed to Israel, although the Mossad is alleged to have been involved. In 2022, four more Iranian officials died under unresolved but suspicious circumstances that suggest Israeli involvement, including Ayoob Entezari and Kamran Aghamolaei, two Iranian scientists working at a military research center, who fell ill and died in May 2022. Israel is suspected not only of targeting senior but now also junior scientists.

The attacks on the Iraqi and Syrian nuclear reactors in 1981 and 2007, respectively, show that Israel is willing to go beyond assassination and sabotage to use airstrikes to prevent an adversary from obtaining nuclear weapons.⁴⁴ Israel is not alone in signaling its readiness to use military action. With diplomacy in crisis, “Washington and Jerusalem are already discussing a ‘Plan B’ if a diplomatic settlement remains beyond reach. This path would place Iran and the United States on a collision course—as well

as exacerbate sectarian tensions, deepen societal divisions, and trigger new conflicts from the Levant to Afghanistan.”⁴⁵

The reoccurring attacks are especially dangerous because the tensions between Israel and Iran run so high and are further intensified by the ongoing war in Gaza between Israel and the Iranian-backed terrorist organization Hamas.⁴⁶ The Council on Foreign Relations rates an Israel-Iran military confrontation over Iran’s nuclear program as a top-tier 2023 risk.⁴⁷ The shadow war between Israel and Iran has intensified, and Israeli counterproliferation efforts could push the conflict further into the open. The fragile stability in the region is challenged by the increasingly close relationship between Iran and Russia, adding to the risk of escalation. That is, a conflict between Israel and Iran could become a proxy war between the United States and Russia.

Adding to the complexity of covert operations, not all attacks on Iran’s nuclear program are limited to external actors. In October 2022, Iranian hacking group Black Reward stole information from the Atomic Energy Organization of Iran.⁴⁸ Just as governments have turned to private contractors for espionage, they can also outsource spyware, such as Pegasus’s ForcedEntry security exploit, and commission cyberattacks to gain information about a nuclear program.⁴⁹ Attacks carried out independently by third parties can also heighten the risk of accidental escalation if the perpetrators are misidentified. Iran, for example, might accuse Israel of carrying out a cyberattack perpetrated by a third party (or of hiring that third party to carry out the attack) and retaliate in response.

Like Israel, Saudi Arabia has also made its nuclear intentions clear. Should the Persian archrival go nuclear, Saudi Minister of Foreign Affairs Prince Faisal bin Farhan Al Saud warned in 2022, “all bets are off.”⁵⁰ The kingdom would develop nuclear weapons, and the nuclear dimension of Persian Gulf politics would be in flux. Saudi Arabian Crown Prince Mohammed bin Salman confirmed this objective to Fox News in September 2023.⁵¹ Some red flags can be identified, including the Saudi refusal to sign the gold standard “123 Agreement” with the United States that would prevent the kingdom from enriching domestic uranium and reprocessing spent fuel.⁵² Saudi Arabia has also not yet fully committed to abide by strict international safeguards at its first nuclear site, and it did not sign a CSA with the IAEA to allow the nuclear watchdog to inspect for undeclared nuclear activities. Further, the country is now manufacturing ballistic missiles. Lastly, the kingdom has asked the United States to help—and already received help from China—with uranium enrichment and other elements of its nuclear program. Some observers fear that the kingdom’s recent pattern of behavior suggests that its civilian, peaceful intentions might change in the future.

Saudi Arabia does not yet, however, have a substantial nuclear infrastructure, although pathways to enrichment technology could be found with Chinese help. A small nuclear research reactor at the King Abdulaziz City for Science and Technology on the outskirts of Riyadh remains under construction. Whether the country's refusal to sign the "123 Agreement" indicates a proliferation risk is a matter of debate.⁵³ The gold standard would prohibit the kingdom from developing any type of enrichment technology, but, if it were to sign the agreement, it might feel compelled to violate it by secretly building a small fuel enrichment plant if Iran proliferates further. Saudi Arabia has also turned to Washington to broker diplomatic relations between the kingdom and Israel and to provide other security guarantees beyond nuclear deterrence.⁵⁴ In addition, China has played an increasingly important role as peacemaker between the kingdom and Iran. Riyadh, rather than obtaining its own nuclear deterrent, has looked to other security assurances to boost its defense. Thus, the scale of Saudi Arabia's nuclear ambitions remains a matter of conjecture. While critical infrastructure in Saudi Arabia has been hit by cyberattacks, including a petrochemical plant in 2017 (by Russian hackers), and kinetic attacks (e.g., drone strikes), including a 2019 attack on oil processing facilities (by Iran and the Houthis), no incidents of (or plans for) external interference with Saudi nuclear installations are known. The Russian cyberattack, however, emphasized what is possible. In the face of active nuclear programs in both Iran and Saudi Arabia, Israel would surely amplify its counterproliferation strategy, which it allegedly admitted to in September 2023.⁵⁵

Another player in the Middle East has made ominous comments about obtaining its own nuclear deterrent, which would challenge its obligations and commitments under NATO. Turkey believes it has the right to develop nuclear weapons for defensive purposes. In 2019, Turkish President Recep Tayyip Erdoğan expressed his frustration with the global nuclear order, suggesting that Turkey should not be forbidden from obtaining nuclear weapons.⁵⁶ However, concerns over Turkey's proliferation have been largely exaggerated. As soon as Turkey signed an agreement with Russia on nuclear cooperation in 2010, proliferation concerns were raised. In April 2023, Turkey received its first shipment of nuclear fuel as part of this agreement. While some argue that Ankara is one of the more likely latent nuclear sites to use its nuclear energy program for malicious purposes, its nuclear plant is operated by a third party, Rosatom, and Turkey has no direct access to nuclear material and therefore no way to divert it.⁵⁷ Of course, the intentions of Turkey's leadership cannot be as effectively measured as current capabilities because elites might not reveal all that they are thinking. Turkish interest in a nuclear weapons program might have grown over the years. Two wars in its geographical proximity are likely not reducing

the interest in a stronger defense posture. Turkey, especially its inscrutable leader, should be watched closely. Tel Aviv and Washington would likely consider using all tools at their disposal—including diplomatic pressure and counterproliferation strategies—to prevent either Saudi Arabia or Turkey from obtaining nuclear weapons.

Climate change and concern over energy security are likely to inspire further expansion of nuclear power in the Middle East over the next few years. The UAE, which already has an operable nuclear power plant, recently commissioned a fourth reactor.⁵⁸ Egypt began construction of its first nuclear power plant in July 2022.⁵⁹ Jordan has shown interest in small modular reactors and uranium extraction and mining. All of this activity has been used for peaceful purposes and fully adhered to international safeguards, but regional security concerns and a nuclear Iran could affect that balance. Further, counterproliferation operations do not necessarily need to be “justified” by those employing the strategy. Suspicion alone can be used to rationalize counterproliferation efforts, even against nuclear programs that are subject to safeguards—which can have limitations.

South Korea and Japan

With China advancing claims in the East China Sea and North Korea increasing its nuclear and missile capabilities, Japanese and South Korean calls for domestic nuclear weapons programs are amplifying. In Japan, several politicians—many within the Liberal Democratic Party—have spoken positively about becoming a nuclear weapon state despite their nation’s long tradition of rhetorical ambivalence on the matter.⁶⁰ Putin’s nuclear threats have made the domestic debate about a Japanese nuclear deterrent more urgent.⁶¹ Similarly, some South Korean elites have called for nuclear proliferation to deter an invasion by North Korea.⁶² President Yoon expressed willingness to consider the introduction of tactical nuclear weapons if North Korea’s nuclear threat grows.⁶³ While President Yoon’s statements may have been a bargaining strategy designed to elicit stronger security commitments from the United States, some experts warn that the domestic nuclear trajectory may be difficult to reverse. Debate over a South Korean nuclear deterrent is proceeding.⁶⁴ Elites in both countries have long been empowered with resources to sustain small-scale work on nuclear engineering, thereby maintaining that knowledge base.

The increasing threat perception of China and North Korea has shifted public sentiment in South Korea and Japan. Greater than 70 percent of the South Korean public now supports a nuclear weapons program but not the use of nuclear weapons.⁶⁵ The war in Ukraine has had a large effect on sentiments in Japan, where the public—although less supportive of an

independent nuclear program than South Koreans—has begun to question the U.S. security commitment.⁶⁶ Survey respondents fear both alliance abandonment and entanglement, either of which can lead to support for proliferation in countries under extended deterrence when security guarantees are not perceived to be credible.⁶⁷ As domestic barriers to nuclear weapons have been lowered by thought leaders through the cultivation of new attitudes and even broad support, the political costs of backing down over nuclear issues in negotiations have increased.⁶⁸

The Ukraine-Russia nuclear weapons dimension is making the public and elites in South Korea take North Korea's nuclear threat seriously. The realist perspective would suggest that indigenous nuclear programs should be pursued to deter adversaries from mirroring Russia's invasion. Both Japan and South Korea are strong protégé states that can shield themselves against certain counterproliferation threats, which would hence not be effective in deterring a decision to nuclearize.⁶⁹ Both countries are embarking on a major military buildup. For now, South Korea is looking to strengthen its ties with NATO.⁷⁰ President Yoon attended the NATO summit in Vilnius in July 2023, signaling closer coordination between the alliance and South Korea. The Washington Declaration similarly confirms cooperation among the allies. However, South Korean conservatives and progressives alike have criticized the agreement, and disputes have emerged over the purpose of the NCG.⁷¹

Japan, following the G-7 Hiroshima Summit in May 2023, has continued to maintain its strong position of advocating disarmament. However, Tokyo is also looking for more protection from its allies. Some government officials are questioning the credibility of U.S. assurance. According to Ground Self Defense Force Lieutenant General (retired) Hirotaka Yamashita, there are “growing concerns among those involved in Japanese national security that the US might not actually come to help Japan when it comes down to it.”⁷² Former Prime Minister Shinzo Abe suggested nuclear sharing arrangements, hinting at an increasingly pro-nuclear stance in response to the Russian invasion of Ukraine.⁷³ His posture did not encompass a desire for Japan to have independent nuclear weapons, but it could activate a larger debate. A risk factor that might lead to indigenous nuclear programs in Seoul and Tokyo is the use of Russian tactical nuclear weapons. If Russia used a nuclear weapon, South Korea and Japan would surely ask whether North Korea or China might also be emboldened to do so and would thus likely take a close look at their own defense and nuclear capabilities.

Given geographical proximity, the U.S. alliance, and Seoul's 2022 updated military operational plans, China and North Korea have a strong national security interest in preventing South Korea and Japan from going nuclear. If South Korea were to move toward a nuclear weapons program, however, its

regional adversaries—China and North Korea—would likely take active steps to prevent a new nuclear power in the Asia-Pacific. One option would be to use cyber capabilities, which both countries have shown they possess. China’s cyber defense has become proactive—more preemptive and offensive—as signaled during the Tianfu Cup International Cybersecurity Contest.⁷⁴

Such cyber counterproliferation operations are not common but they are also not new in the Asia-Pacific—North Korea attacked the Korea Atomic Energy Research Institute, South Korea’s nuclear research body, in 2021, and in 2014 the Japanese Monju Nuclear Power Plant was infected with malware.⁷⁵ In the first instance, the hacker group Kimsuky (affiliated with North Korea’s Reconnaissance General Bureau spy agency) targeted South Korea’s largest think tank studying nuclear technology. What information the hackers obtained is unclear. In the second case, the malware attack stole—and released online—a significant amount of data from the power plant’s control room.

Washington’s efforts to organize a strong, unified response to the Ukrainian invasion have likely reassured South Korea and Japan that the United States would also fulfill its defense commitments to them. However, if security dependence on the United States is questioned or weakened—or should Washington fail to demonstrate a forceful response if China moves against Taiwan—both Japan and South Korea may seek strategic autonomy through nuclear weapons. The risk of Asia-Pacific escalation would then increase tremendously. In April 2023, Washington signaled to South Korea the intensity of the American commitment to defend the country by promising to deploy nuclear-armed submarines in the South’s territorial waters for the first time since the 1980s.

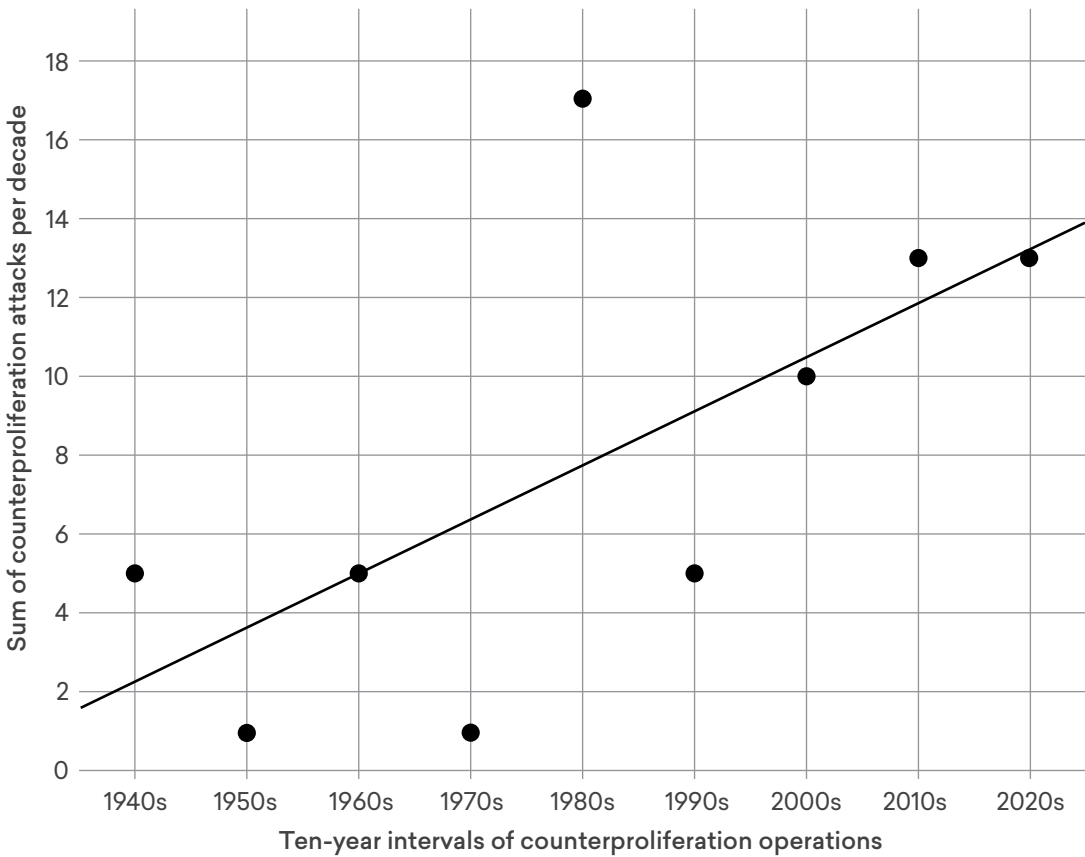
Quantitative Trends and Concerns in Counterproliferation

How do these individual cases fit into the history of counterproliferation operations? Figure 1 shows a summary of known counterproliferation operations (by decade) from 1940 to 2023.⁷⁶ It is too early to speculate how the war in Ukraine might have affected such operations, but seven of the seventy identified attacks occurred after the invasion, which is more than in any other two-year period prior to 2022. Furthermore, the graph includes only those operations that were executed, not those that were merely considered. Overall, the number of counterproliferation cases is limited despite the large time span and opportunities for countries to attack and sabotage other nuclear programs. Preventive military force is considered a rarity in the literature.⁷⁷ States could have resorted to counterproliferation in certain cases but decided against this option. Furthermore, if attacks suspected to have been carried out by Israel are removed from the picture,

the number is even lower, leading to the conclusion that most states do not appear to resort to counterproliferation operations when diplomatic means to curb nuclear proliferation fail.

Furthermore, except for Israel, no state has explicitly threatened a counterproliferation attack since 1940. In the 1960s, for example, although Egypt made threats against Israel when President Gamal Abdel Nasser noted several times that Egypt would attack Israeli nuclear facilities, these were empty threats made in the hope that the United States would do something about the Israeli nuclear program.⁷⁸ The absence of recent explicit verbal threats to take counterproliferation measures does not rule out the possibility that countries might be engaging in such measures covertly. Countries might not feel that implicit threats will have the desired effect of spurring the international community

Figure 1: Timeline of Known Counterproliferation Operations⁷⁹



Source: Doreen Horschig, “Turning a Blind Eye: Nuclear Counterproliferation and the International Audience” (working paper presented at the International Studies Association Annual Conference, Montreal, 2023).

to act against a nuclear program. Words not spoken and absent signals are almost as important as what is said and what action states take.

Despite the overall low number of attacks, the trend line in Figure 1 suggests a slight upward movement in these operations. The number of cases reported in the early 2020s—fifteen—is already more than for the entire 1980s. The collection of cases shows a handful of programs in the later years (namely, those of North Korea and Iran), with Israel, Russia, and North Korea being the main counterproliferation perpetrators. The trend is concerning and should be closely observed because it shows a small statistical significance.⁸⁰ Recent attacks, including the 2022 and 2023 drone attacks on the Parchin military complex and Isfahan Nuclear Technology Center, the 2022 cyberattacks on U.S. National Laboratories, and the 2022 assassinations of Iranian junior scientists are amplifying the trend. If this development continues, the global nonproliferation regime will be further undermined, because it will show that states do not consider the traditional tools to be sufficient curbs on nuclear proliferation.

When diplomacy and negotiations are viewed as inadequate, we might begin to see more incidents at military and nuclear sites. States that used covert counterproliferation operations in the past have not faced significant international repercussions, which may encourage states that use this strategy to be even more confident in doing so. Counterproliferation delegitimizes the global nuclear verification regime, which opposes sabotage and military attacks. If they are to successfully protect, restrict, and monitor all nuclear developments, the IAEA's CSAs, Additional Protocol, and multilateral institutions must retain their credibility. Sigvard Eklund, former IAEA director general, saw this threat to the nonproliferation regime in 1981 after the Israeli air force carried out Operation Opera: "From a point of principle, one can only conclude that it is the Agency's safeguards regime which has been attacked."⁸¹

Figure 1 also includes cases of counterproliferation that interfere with modernization in countries that *do* have nuclear weapons. Preventative force for counterproliferation purposes is usually considered a tool to prevent new nuclear states, but it can also be used to thwart modernization in states that already possess nuclear weapons. For example, during the summer of 2022, the Russian hacker group Cold River was accused of targeting the U.S. Argonne, Brookhaven, and Lawrence Livermore National Laboratories.⁸² According to Adam Meyers, senior vice president of intelligence at CrowdStrike, the group "directly support[s] Kremlin information operations."⁸³ Whether its attempts were successful—or even what the group was trying to achieve—is unknown, but the attacks demonstrated Russia's capabilities, malicious intentions, and willingness to interfere with U.S. nuclear activities. The 2022 attack was also not a novelty. From 2012 to 2018,

Russia repeatedly targeted U.S. nuclear power plants and entities such as the Nuclear Regulatory Commission, Wolf Creek Nuclear Operating Corporation, and Kansas Electric Power Cooperative.⁸⁴ What is unknown is whether these attacks were intended to disrupt critical infrastructure in case of conflict or to prevent U.S. nuclear weapons modernization.

Development of traditional arms control between the United States and Russia (and now China) has stalled, especially since the invasion of Ukraine. The full consequences of the Ukraine war on arms control and disarmament are yet to be seen, but Russia's termination of on-site inspections and its withholding of data, including numbers of deployed warheads and delivery vehicles, is not a promising development for strategic stability or the promotion of transparency. Given the Russian suspension of New START and the subsequent U.S. countermeasures, the two parties will likely have difficulty concluding a follow-on treaty in 2026.⁸⁵ Without a formal bilateral treaty, Russia and the United States could produce strategic nuclear weapons and deploy new systems without checks on each other. Transparency and trust would be nearly nonexistent, and mutual suspicion would grow. For now, some risk reduction measures (e.g., the hotlines discussed in Wilfred Wan's paper in this publication) remain in place. However, without New START and other measures, incentives for enhanced counterproliferation will increase due to misperception and an overreliance on national technical means in the absence of transparency.

Without quantitative or qualitative limits on nuclear arsenals, nuclear-armed states might also reconsider the testing of nuclear weapons. Putin mentioned in February 2023 that Russia is ready to resume nuclear weapons testing if the United States does.⁸⁶ The Biden administration has made no indication that it wants to resume testing. However, this might change with the next administration. Officials of the Trump administration had suggested that resumed testing might be a way to pressure Russia and China into arms control talks.⁸⁷ The iniquitous effects to the environment, health, and security are uncontested. Less well known is the risk that an opponent might resort to counterproliferation as a way to hinder testing. The danger of a return to nuclear testing emphasizes the importance of existing nonproliferation tools to curb vertical nuclear proliferation.

Another nuclear state that is the target of counterproliferation operations is North Korea. U.S. policymakers and defense contractors speak only vaguely about these actions and keep most information classified, but the United States allegedly has used left-of-launch strikes against Pyongyang's missile testing.⁸⁸ This strategy seems to be part of an effort to reduce the cost of engagement in missile defense and to mitigate the proliferation of ballistic missiles. It is both an offensive strategy, in the case of the launch

of these weapons in war times, and a counterproliferation tool to interfere in the testing of such missiles and prevent their development. Counterproliferation campaigns are some of the most critical U.S. defense programs, and Washington cloaks them for good reason. Adding to the suspicion of covert operations is the delay in nuclear weapons testing that North Korea was allegedly ready for in early 2022.⁸⁹

While the question of whether counterproliferation operations are always morally wrong or negative is beyond the scope of this paper, these attacks, as with most covert operations, frequently carry risks and are undesirable for national security.⁹⁰ However, they arguably pose lower risks of escalation relative to overt operations. Counterproliferation has had a bad reputation since at least the Iraq War (which was sold as an act of counterproliferation), when President George W. Bush pointedly warned that “the United States of America will not permit the world’s most dangerous regimes to threaten us with the world’s most destructive weapons.”⁹¹ A surge in nuclear proliferation and counterproliferation risks a spiral effect, heightening tensions and increasing the risks of escalation. For example, Iran, in response to Israeli interference with its nuclear ambitions, ramped up its Mossad cell-targeting operation.⁹² In March 2022, Iran fired ballistic missiles on Israeli targets in Iraq. This attack was in retaliation for a secret Israeli airstrike on an Iranian drone factory a month earlier. This so-called quiet or shadow war has been going on for decades. However, with Iran advancing its nuclear program, the risk of escalation is increasing in a conflict that is already growing in intensity. If covert attacks raise tensions, then countries would be wise to heed the cautionary advice of experts who urge them to pursue other strategies.

The academic literature shows that these operations are not always effective in preventing proliferation.⁹³ Offensive cyber operations have not had the promised revolutionary potential and may only temporarily disrupt and delay a nuclear program, if the attack remains clandestine, but they rarely halt nuclear proliferation altogether.⁹⁴ The operations are usually successful only when used in combination with conventional weapons.⁹⁵ Additionally, assassinations may delay but not stop a program and therefore have modest success at best.⁹⁶ The most successful cases are those that occur well before an imminent nuclear proliferation threat is present.⁹⁷

Instead, significant risks are associated with these operations. Scholarly findings suggest that countries that target nuclear programs are willing to accept a substantial amount of risk and cost if they believe the opponent’s nuclear program poses (or will pose) a significant threat to their security.⁹⁸ They are not deterred by the prospect of military retaliation, which presents an inherent risk of conflict escalation. Such attacks can also reduce the likelihood of a diplomatic solution and increase the difficulties

that regulators face in monitoring a nuclear program.⁹⁹ Further, counterproliferation can also inadvertently cause proliferation. If a country wants nuclear weapons for security reasons, attacking them might only strengthen that desire, thereby increasing proliferation risks. Stuxnet is an example of an operation that had an adverse effect, since it encouraged further Iranian proliferation.¹⁰⁰ Thus, counterproliferation strategies might not just fail but encourage proliferation in addition to intensifying a conflict.

Fortunately, we are unlikely to see military airstrikes, such as the Israeli attacks on Iraq in 1981 and on Syria in 2007, on nuclear installations in countries that have nuclear weapons. The risks of escalation to war between nuclear states and the costs to the aggressor's international reputation are extremely high. An airstrike by a nuclear country on a nonnuclear, proliferating country is still unlikely but not out of the question.

Conclusion and Policy Implications

In this paper, I have explored whether states consider counterproliferation to be an alternative to traditional arms control and nonproliferation efforts to hinder qualitative and quantitative developments in nuclear programs. An analysis of current empirical examples of possible proliferators and activities by counterproliferators found no major expansion in counterproliferation operations. However, the quantitative data suggest that a new trend of increased activity may be in its infancy and that, while counterproliferation operations are not yet a common tool to prevent proliferation, several cases warrant attention. If proliferation or calls for proliferation increase specifically because of the Russian invasion, so, too, will counterproliferation incentives. This in turn would increase the risk of war because of retaliatory action or nuclear accidents (e.g., if counterproliferation attacks on nuclear facilities go awry).

An effective nonproliferation regime to stabilize the current escalatory spiral is crucial. Prioritizing transparency, negotiating IAEA access to nuclear sites in nuclear and nuclear-ambitious countries, and creating time and space for talk and negotiations should be at the forefront of the diplomatic toolbox as officials work to prevent qualitative and quantitative nuclear proliferation. Because of the current crisis of nuclear arms control, leaders should explore pathways that could lead back to the precrisis track of reducing existing nuclear arsenals and preventing nuclear ambitions in nonnuclear states.

To avoid further escalation, officials should continue to revive traditional nonproliferation approaches and alternatives (for more on this, see the other papers in this publication). On the current trajectory, 2026 will mark the first year since 1972 with no substantive nuclear arms control

treaty. Several analysts see no future in traditional arms control agreements to curb existing programs and new proliferation. However, existing frameworks should not be completely disregarded, as they offer many lessons. Furthermore, an agreement to limit intermediate-range missiles (similar to the 1987 Intermediate-Range Nuclear Forces Treaty) is in the interest of all three major powers—Russia, China, and the United States. The ratification of any effective, verifiable treaty by Congress will face domestic challenges, but that does not mean the attempt should be abandoned. Any formal treaty will have to have bipartisan support. An alternative approach could be the development of frameworks that do not require congressional approval, such as presidential nuclear initiatives.

More recent approaches, such as integrated, cross-domain, asymmetric, and behavioral arms control that address new technologies of nuclear weapon states and manage multifaceted security risks to enhance stability, should also be considered.¹⁰¹ The TPNW has not been effective in restricting nuclear states' modernization but can play an important role in reinforcing the norm against the possession and use of nuclear weapons among nonnuclear states that have shown no interest in proliferation. Further, bilateral agreements barring countries from attacking nuclear installations are another option worthy of policy consideration. A good example of this is the 1988 nonnuclear aggression agreement between India and Pakistan.¹⁰²

U.S. policymakers should consider whether such agreements are possible between other countries, such as Israel and Saudi Arabia, where Washington is already taking the role of a mediator. If such negotiations are at too early a stage to include nuclear aspects, diplomatic discussions and meetings to improve relationships between adversaries may also help to reduce proliferation incentives. For example, Washington's complex nonnuclear diplomatic talks with Israel and Saudi Arabia, if successful, could lower Riyadh's threat perception and further avert nuclear ambitions in the kingdom.

Extended deterrence for Japan and South Korea should also be strengthened to avert their nuclear ambitions. A commissioned Chicago Council report suggests the creation of an Asian Nuclear Planning Group that jointly discusses U.S. nuclear planning and forces.¹⁰³ This could build on the intensified U.S. assurances and newly established NCG between South Korea and the United States under the Washington Declaration, but extend to include additional Asian players.¹⁰⁴ Such a group would increase transparency and trust among U.S. allies and reduce a perceived need for their own domestic deterrent. However, signaling credible commitment is a notorious, age-old concern of the nonnuclear states protected by these umbrellas. If U.S. extended deterrence in Europe shows the smallest crack

during the war in Ukraine, then the calls for independent nuclear programs in South Korea and Japan are likely to get louder. Both countries need a continuous signal that they will be worse off if they proliferate, because proliferation would lead to the loss of U.S. protection. Some have suggested the redeployment of U.S. tactical nuclear weapons and anti-ballistic missile systems on South Korean soil. Instead of deploying them, the United States could signal its commitment by discussing plans with Seoul to deploy them quickly if needed.

Any uncertainty about the effectiveness of the nonproliferation regime could increase incentives for states to consider military options. Further, in response to an adversary's nuclear program, a state might launch a counterproliferation military strike if it perceived such a preventive war to be less costly than the consequences of its own proliferation.¹⁰⁵ Despite stalled progress on arms control and nonproliferation, a preference for negotiations could grow stronger and provide an opportunity for a new diplomatic approach because of the shifting geopolitical landscape combined with technological advances. Options in nuclear countries and with possible proliferators are not ideal, but interim gesture-for-gesture agreements with informal sets of measures might be possible. Even a Russian nuclear attack against Ukraine might lead to more calls for arms control and disarmament.

If no effective efforts are made in this new era to prevent qualitative and quantitative nuclear proliferation, disarmament and nonproliferation efforts will be two more casualties of the Russia-Ukraine war and other global tensions. As a result, the risk of counterproliferation becoming the new toolkit to prevent proliferation will only increase. Open-source information suggests that only the United States, Israel, Russia, China, and North Korea follow an active nuclear counterproliferation policy and consider preventive force a viable instrument to hinder nuclear proliferation. However, with a weakened nonproliferation regime and lower entry barriers to counterproliferation operations, the number of actors using such strategies could increase. Actors should be wary not only of the risk of another nuclear power but the increased tensions that come from trying to prevent nuclearization through counterproliferation. This is a troubling state of affairs with serious escalation consequences.

Further research should examine U.S. willingness to resort to covert operations when allies or partners show an interest in their own nuclear deterrent. As evidence and speculation increase that others are using counterproliferation operations to prevent nuclear programs, the United States might also resort to such measures. Historically, when U.S. allies have shown interest in proliferation, Washington has used several strategies and tools to keep them in check, such as reminding them of their commitment to the NPT and offering security guarantees and defense commitments, as well

as more hawkish approaches, such as threatening to withhold commercial nuclear technology.¹⁰⁶ The United States has demonstrated its willingness to take coercive steps. How far it is willing to go warrants closer analysis.

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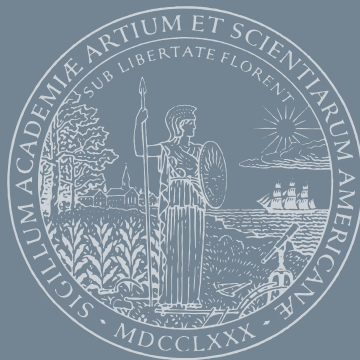
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