

Opinion Biological warfare is a real threat. How can we deter it?

Researchers around the globe are tinkering with viruses far deadlier than covid-19.

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President Richard M. Nixon's bold 1969 decision to renounce biological weapons and spearhead a treaty to ban them helped contain the threat of a man-made pandemic for half a century.

But our inheritance from Nixon is now fading. And in this age of synthetic biology, unless we act quickly to deter our adversaries from making and using bioweapons, we could face disaster in the near future.

The nightmare of a biological holocaust is far from fanciful. A recent [Post investigation](#) showcased Russia's reopening and expansion of a military and laboratory complex outside Moscow that was used during the Cold War to weaponize viruses that cause smallpox, Ebola and other diseases. In China, senior military officers have been writing for years about the potential benefits of offensive biological warfare. One prominent colonel termed it a "[more powerful and more civilized](#)" method of mass killing than nuclear weapons. An authoritative People's Liberation Army textbook [discusses the potential](#) for "specific ethnic genetic attacks."

At the same time, breakthroughs in gene-editing technology and artificial intelligence have made the manipulation and production of deadly viruses and bacteria easier than ever, for state and non-state actors alike. The 2019 outbreak of covid-19 in Wuhan, China, which might have involved an accidental leak of an artificially enhanced coronavirus, offers a sense of the stakes: [Some 27 million people have died](#) as a direct or indirect result of that virus. And researchers around the globe — civilian and military — are tinkering with viruses far deadlier than that one.

The question is: How do we achieve bioweapons deterrence?

Treaties and conventions alone cannot solve this problem. Nor are nuclear deterrence models quite up to the task. The prospect of mutually assured destruction is unlikely to inhibit death-obsessed terrorists who have a better shot at acquiring bioweapons than nuclear weapons. Dictatorships might be tempted to unleash a bioweapon if they are confident the nations they target would struggle to pinpoint the source of the attack — and if the attackers believe they can do more damage to their enemies than to their own population. They might, for example, covertly vaccinate their people before launching an attack. Or they might succeed in developing pathogens capable of disproportionately [affecting specific ethnic groups](#), as envisioned by Chinese generals.

The Cold War nonetheless offers useful lessons for democracies that have chosen to forgo bioweapons. Foremost is the importance of superior intelligence gathering and analysis. For deterrence to work, Washington and its allies must have a robust, pervasive system for tracking and, where possible, eliminating highly dangerous research around the world. This surveillance system must also harness cutting-edge technologies to quickly detect newly emergent pathogens, gauge their threat level and reliably pinpoint their source — whether natural or engineered.

Our current antiquated warning system depends heavily on foreign governments alerting U.S. health officials after cases of an unusual illness have begun to appear in clinics and hospitals. By then, it is sometimes too late to head off an epidemic, even where governments are competent, conscientious and transparent. Where governments are malign, callous and opaque, the results can be far worse. China, for example, deliberately concealed from other governments and the World Health Organization that covid-19 was highly transmissible, even by asymptomatic patients. Beijing also blocked all serious efforts to investigate the origin of the novel coronavirus.

This is why biological surveillance, detection and attribution must become a core national security function, and not merely a public health activity, of the United States and friendly nations. Congress, working in consultation with the Defense Department and the Office of the Director of National Intelligence, should immediately establish and fund a new intelligence discipline: biological intelligence, or BIOINT, to mobilize allied governments and private companies to detect and assess high-risk scientific research and incipient biological threats.

The history of the U.S. nuclear forensics program provides a rough template. Fearing Nazi Germany's potential to develop an atomic weapon, scientists affiliated with the Manhattan Project arranged in 1943 for the United States to scoop up German air and water samples to test whether that country was operating a nuclear reactor. A Cold War successor program equipped U.S. aircraft to sniff out radioactive particles over the Pacific Ocean, providing Washington with hard evidence that the Soviets had tested their first atomic bomb in 1949.

Nuclear intelligence, or NUCINT (a term that eventually gave way to a broader discipline called "measurement and signature intelligence," or MASINT), was further refined to forensically discern the origin of nuclear materials used in bombs. The United States and its allies compiled databases of radiochemical and environmental signatures unique to individual uranium mines and processing facilities. The idea was to deter the covert sale of nuclear weapons by demonstrating that Washington could credibly trace the origin of a weapon even after detonation.

Similar experimental projects are underway today in the realm of biology. The United States has funded pilot programs to conduct environmental sampling and genetic testing of air and wastewater from laboratories, ships, military bases, embassies and key transportation hubs such as airports in several countries. (Full disclosure: Matthew McKnight, a writer on this op-ed, works at Ginkgo Bioworks, which has U.S. government contracts to conduct some of this work.) When combined with anonymized data from hospitals and pharmacies, a biological mosaic begins to emerge, providing analysts with a baseline of "normalcy" against which new biothreats can be quickly detected.

Techniques of molecular forensics mean a newly detected pathogen can also be sequenced and analyzed to determine whether it occurred naturally or through the machinations of scientists. As data libraries grow and AI models improve, analysts will become far less likely to be stumped by the origins of a new disease such as covid-19.

The main impediment to expanding and improving nascent U.S. BIOINT efforts isn't technology, but resolve. Congress recently watered down the Biden administration's latest budget request for pandemic prevention. The "biosurveillance" network prescribed by the Pentagon's 2023 Biodefense Posture Review also remains underfunded.

To be sure, effective BIOINT won't by itself deter our adversaries. The United States must also show that it has the will to impose steep costs on those that pursue, much less employ, bioweapons. We must also learn how to respond to pandemics with vastly greater speed and dexterity than during the coronavirus pandemic. We must improve on the success of Operation Warp Speed, the public-private partnership that delivered coronavirus vaccines in record time, and replicate that model to mass produce rapid tests, protective equipment and therapeutics quickly enough to mitigate the death and disruption that could be caused by a biological attack.

Yet these elements of deterrence won't work unless they are underpinned first by world-class BIOINT. By proactively investing in robust biosurveillance, attribution capabilities and rapid countermeasure development, Washington and its allies can safeguard the promise of the life sciences revolution and ensure that biotechnology remains a force for good, not a new frontier of global catastrophe.