



By W.J. Hennigan *W.J. Hennigan writes about national security for Opinion.*

IF IT SEEMS ALARMIST to anticipate the horrifying aftermath of a nuclear attack, consider this: The United States and Ukraine governments have been planning for this scenario for at least two years.

In the fall of 2022, a U.S. intelligence assessment put the odds at 50-50 that Russia would launch a nuclear strike to halt Ukrainian forces if they breached its defense of Crimea. Preparing for the worst, American officials rushed supplies to Europe. Ukraine has set up hundreds of radiation detectors around cities and power plants, along with more than 1,000 smaller hand-held monitors sent by the United States.

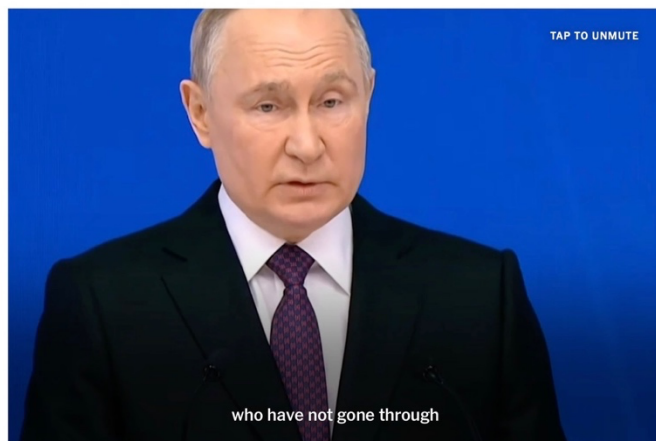
Nearly 200 hospitals in Ukraine have been identified as go-to facilities in the event of a nuclear attack. Thousands of doctors, nurses and other workers have been trained on how to respond and treat radiation exposure. And millions of potassium iodide tablets, which protect the thyroid from picking up radioactive material linked with cancer, are stockpiled around the country.

But well before that — just four days after Russia launched its invasion of Ukraine, in fact — the Biden administration had directed a small group of experts and strategists, a “Tiger Team,” to devise a new nuclear “playbook” of contingency plans and responses. Pulling in experts from the intelligence, military and policy fields, they pored over years-old emergency preparedness plans, weapon-effects modeling and escalation scenarios, dusting off materials that in the age of counterterrorism and cyberwarfare were long believed to have faded into irrelevance.

The playbook, which was coordinated by the National Security Council, now sits in the Eisenhower Executive Office Building, next to the West Wing of the White House. It has a newly updated, detailed menu of diplomatic and military options for President Biden — and any future president — to act upon if a nuclear attack occurs in Ukraine.

At the heart of all of this work is a chilling conclusion: The possibility of a nuclear strike, once inconceivable in modern conflict, is more likely now than at any other time since the Cold War. “We’ve had 30 pretty successful years keeping the genie in the bottle,” a senior administration official on the Tiger Team said. While both America and Russia have hugely reduced their nuclear arsenals since the height of the Cold War, the official said, “Right now is when nuclear risk is most at the forefront.”

Russian President Vladimir Putin reminded the world of this existential danger last week when he publicly warned of nuclear war if NATO deepened its involvement in Ukraine.



PRESIDENT VLADIMIR PUTIN, FEBRUARY 2024

The risk of nuclear escalation in Ukraine, while now low, has been a primary concern for the Biden administration throughout the conflict, details of which are being reported here for the first time. In a series of interviews over the past year, U.S. and Ukrainian officials spoke on condition of anonymity to discuss internal planning, diplomacy and ongoing security preparations.

And while it may cause sleepless nights in Washington and Kyiv, most of the world has barely registered the threat. Perhaps it's because an entire generation came of age in a post-Cold War world, when the possibility of nuclear war was thought to be firmly behind us. It is time to remind ourselves of the consequences in order to avoid them.

**IMAGINE
A NUCLEAR WEAPON
IS LAUNCHED.**

A nuclear warhead, which has more than half of the Hiroshima bomb's explosive power, fits snugly into the cone of a short-range missile.

The missile is launched. Once its solid-fuel rocket motor burns out, the warhead plunges back toward Earth.

A third of a mile above the ground, it explodes.

Its plutonium core and surrounding contents — so delicately pieced together inside — convert into ionized gas and electromagnetic waves within a millisecond.

A brilliant white flash envelops the sky for miles, briefly blinding everyone who witnesses it.

Nearly everything flammable below ignites: wood, plastics, oil. Small animals burst into flame, then turn to ash.

Ruptured gas and downed electricity lines fuel an inferno that can rage for miles.

The firestorm consumes so much oxygen that it can suffocate people sheltering inside their cars or homes.



Then there is the shock wave, a ramming force that expands in every direction, racing at supersonic speeds.



Buildings, trees and other living things are torn apart and thrown at one another.



Near the explosion's epicenter, buildings heave, sag and crumble, scalding hot glass and debris shoot like shrapnel into everything in their path.



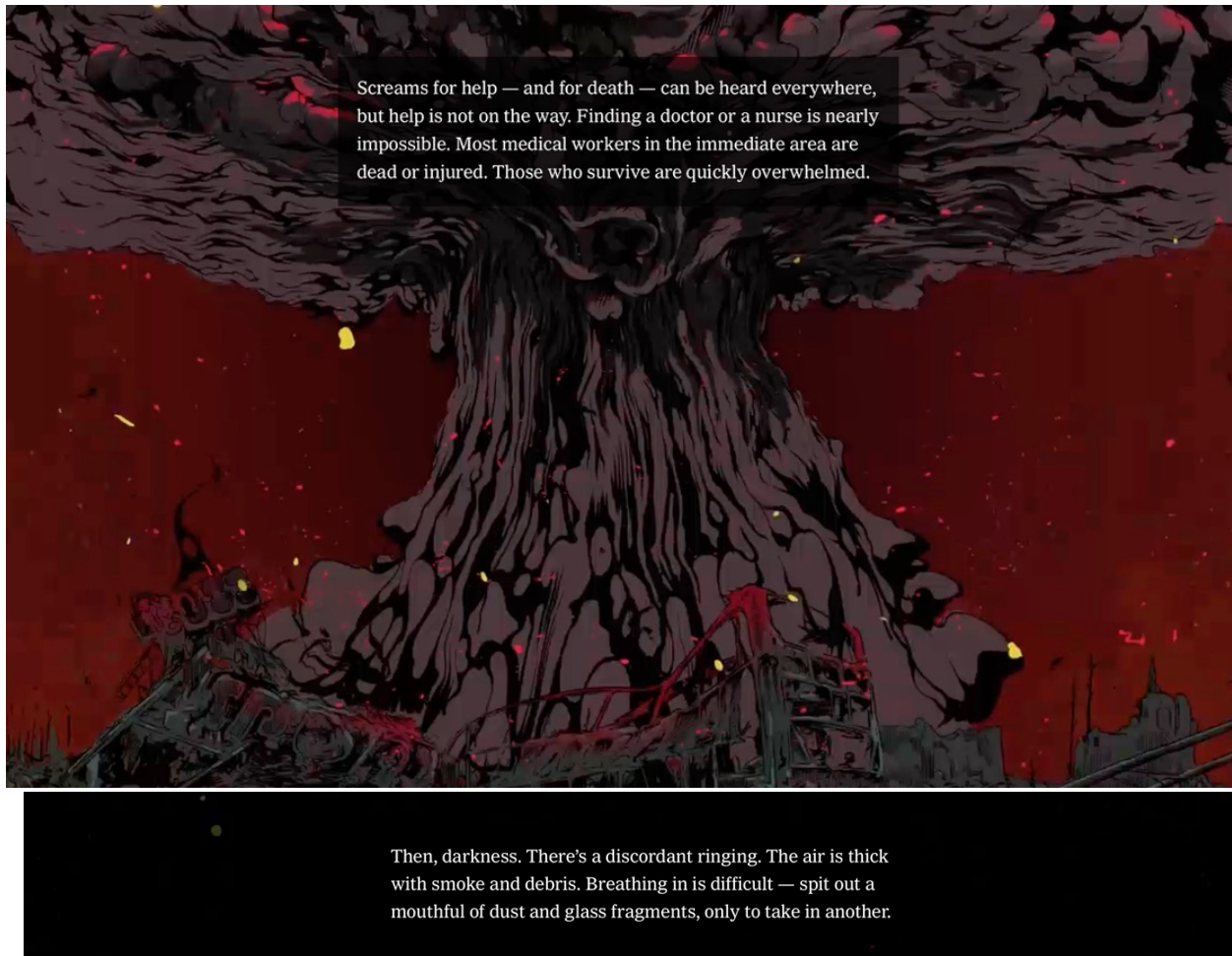
Dry leaves crackle like popcorn and disappear in the blazing heat.



The wreckage — what once was asphalt, steel, soil, glass, flesh and bone — is suctioned into the rolling stem of a mushroom cloud rising for miles.

The cloud appears like a living thing. Its colors change from white to yellow to red to black, billowing into the sky until it eclipses the sun.



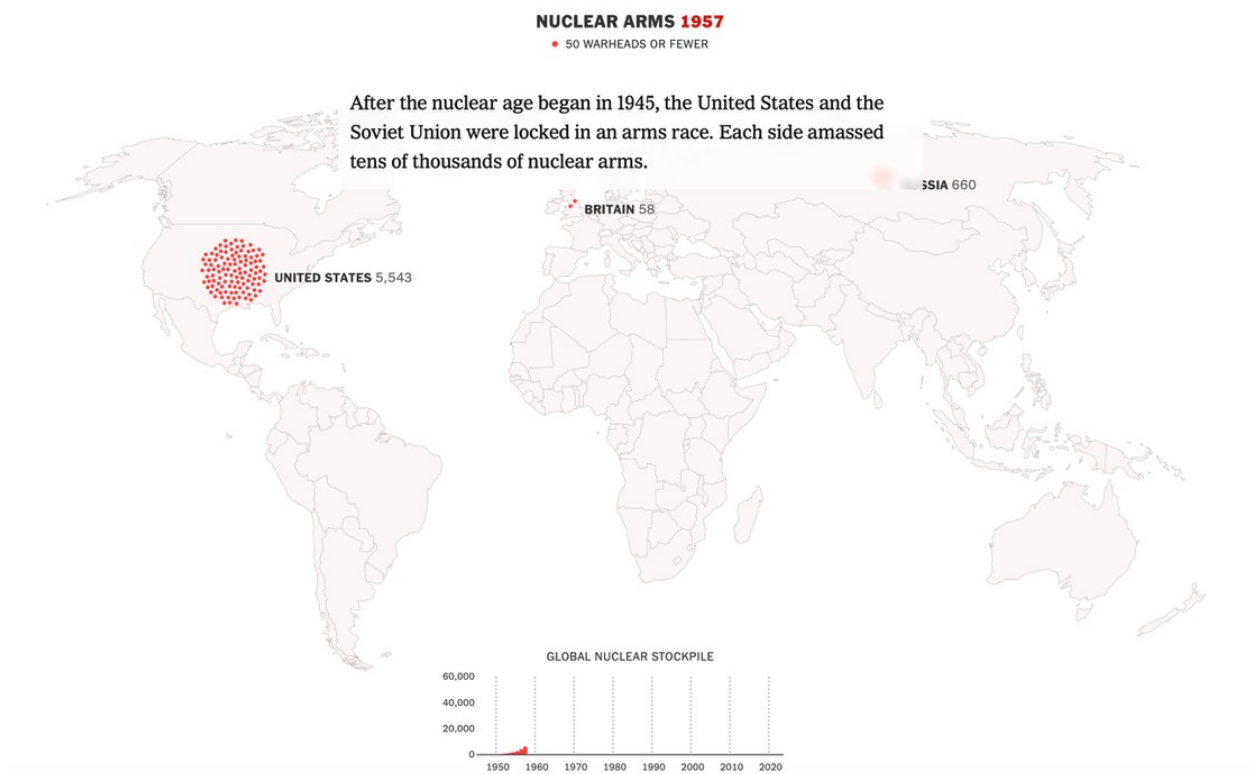
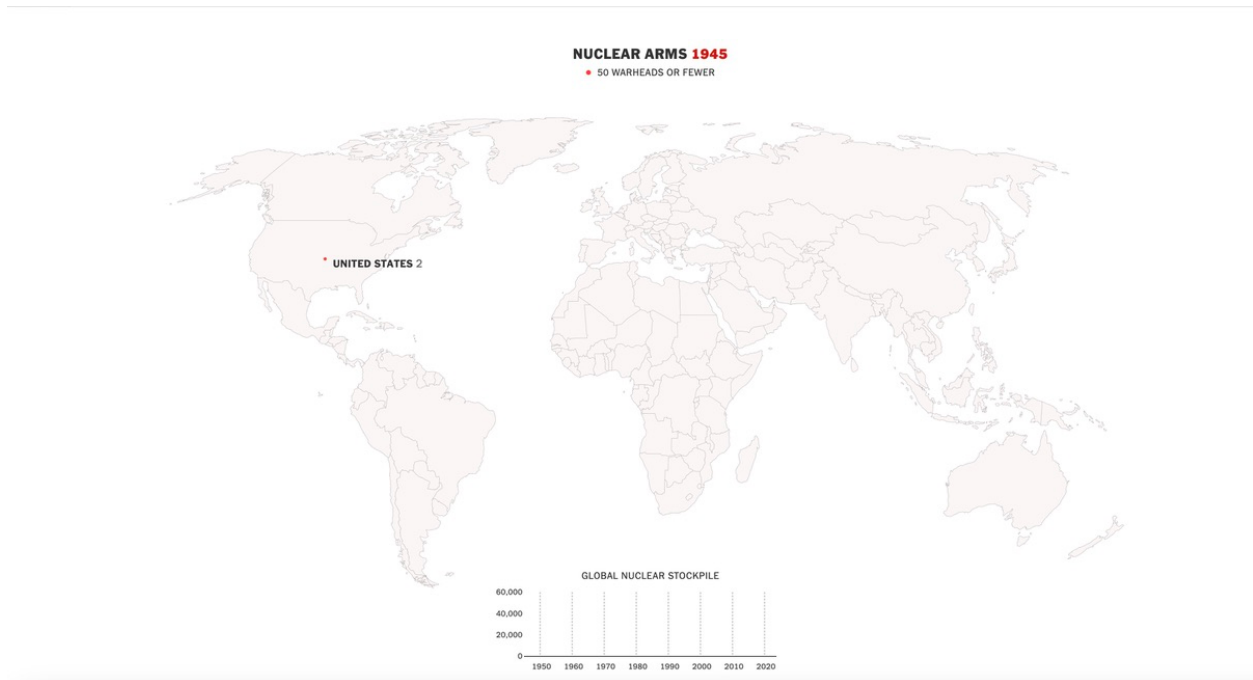


EVEN AFTER LAST week's nuclear threat, few believe that Mr. Putin will wake up one day and decide to lob megaton warheads at Washington or European capitals in retaliation for supporting Ukraine. What Western allies see as more likely is that Russia will use a so-called tactical nuclear weapon, which is less destructive and designed to strike targets over short distances to devastate military units on the battlefield.

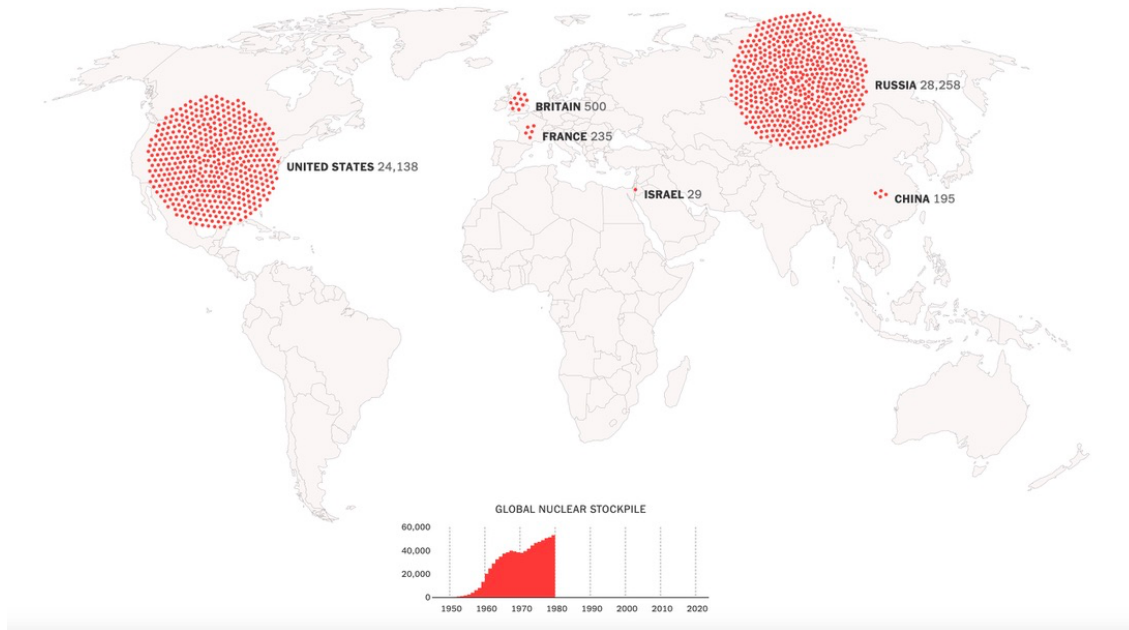
The strategic thinking behind those weapons is that they are far less damaging than city-destroying hydrogen bombs and therefore more “usable” in warfare. The United States estimates Russia has a stockpile of up to 2,000 tactical nuclear warheads, some small enough they fit in an artillery shell.

But the detonation of any tactical nuclear weapon would be an unprecedented test of the dogma of deterrence, a theory that has underwritten America's military policy for the past 70 years. The idea stipulates that adversaries are deterred from launching a nuclear attack against the United States — or more than 30 of its treaty-covered allies — because by doing so they risk an overwhelming counterattack.

Possessing nuclear weapons isn't about winning a nuclear war, the theory goes; it's about preventing one. It hinges upon a carefully calibrated balance of terror among nuclear states.

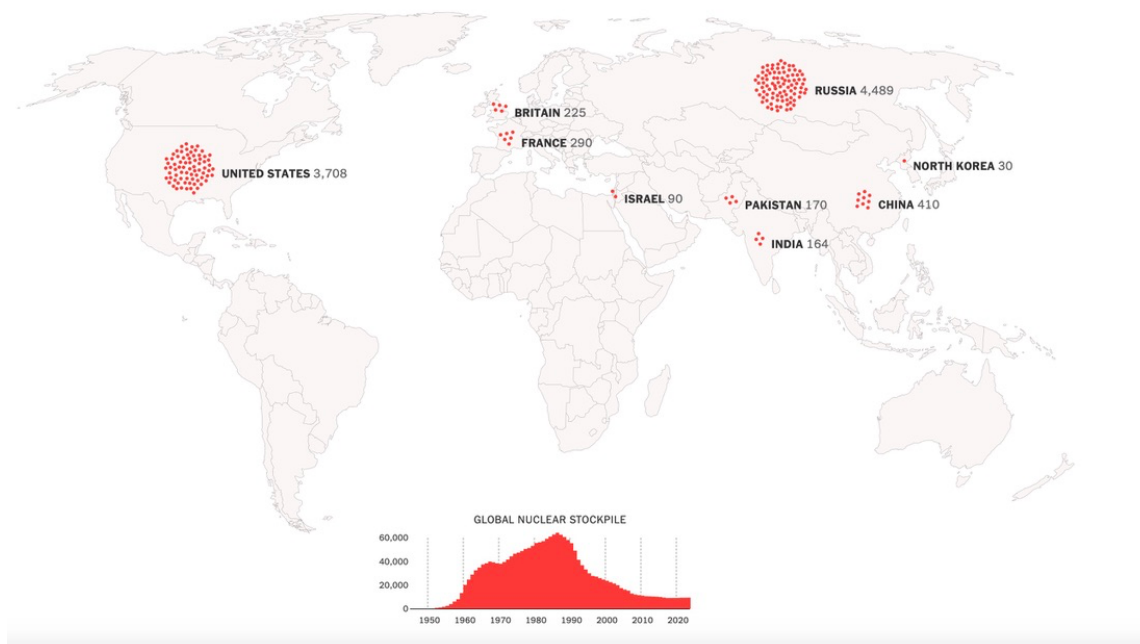


Over time, nuclear weapons became symbols of national power and prestige. Other nations in Europe and Asia developed their own arsenals.



NUCLEAR ARMS 2023

• 50 WARHEADS OR FEWER



SOURCE: FEDERATION OF AMERICAN SCIENTISTS
FIGURES AND DATES ARE BASED ON ESTIMATES OF THE NUMBER OF WARHEADS FOR MILITARY USE AND MAY NOT MARK WHEN A NATION'S FIRST NUCLEAR TEST TOOK PLACE.

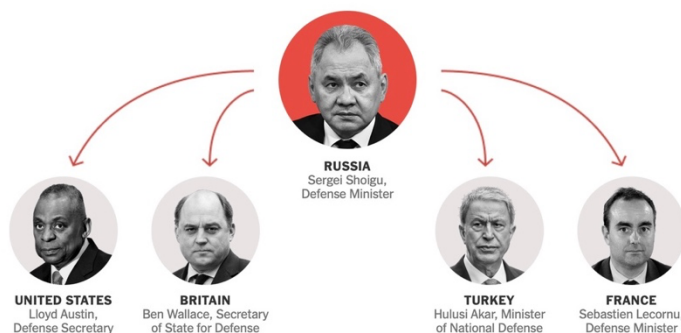
IF MR. PUTIN dropped a nuclear weapon on Ukraine — a nonnuclear nation that’s not covered by anyone’s nuclear umbrella — what then? If deterrence fails, how is it possible to reduce the risk of one attack escalating into a global catastrophe?

We might find an answer in the autumn of 2022, when fears of Russia’s nuclear use in Ukraine were most palpable. A lightning Ukrainian military counteroffensive had reclaimed territory from the Russians in the northeastern region of Kharkiv. The Ukrainians were on the cusp of breaching Russian defense lines at Kherson in the south, possibly causing a second Russian retreat that could signal an imminent broader military collapse.

U.S. intelligence estimated that if Ukraine’s fighters managed to break through Russian defenses — and were on the march to the occupied Crimean Peninsula, where the Russian Black Sea Fleet is based — it came down to a coin flip whether or not Russia would launch a tactical nuclear weapon to stop them, senior administration officials said.

Moscow has made implicit and explicit nuclear threats throughout the war to scare off Western intervention. Around this time, however, a series of frightening episodes took place.

On Oct. 23, Defense Minister Sergei Shoigu of Russia made a flurry of phone calls to the defense chiefs of four NATO nations, including Defense Secretary Lloyd Austin, to say Russia had indications that Ukrainian fighters could detonate a dirty bomb — a conventional explosive wrapped in radioactive material — on their own territory to frame Moscow.

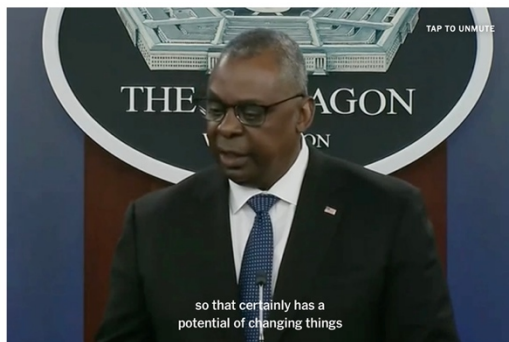


American intelligence also intercepted chatter around then among Russian military leaders about using a tactical nuclear weapon, according to current and former Biden administration officials. General Austin and the Joint Chiefs of Staff chairman, Gen. Mark Milley, held three phone calls in four days with Russian counterparts during this tense period.

Believing the Russians were building an unfounded pretext for their own nuclear attack, the Biden administration quickly began a multilateral effort with allies, adversaries and nations in between to de-escalate the situation and try to talk Moscow out of it. For nearly a week, Biden aides pulled all-nighters at the White House, coordinating high-level conversations and planning for the worst: the detonation of a small nuclear device in Ukrainian territory that had the power of a few kilotons or less.

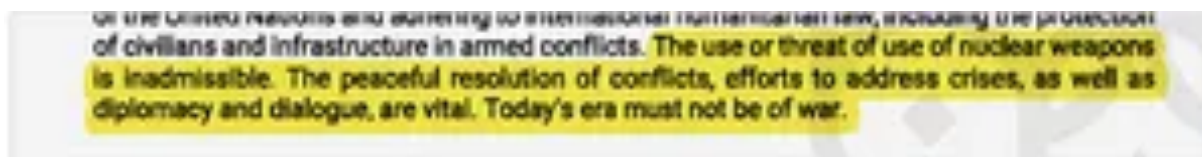
Many in the administration believed the Kremlin's dirty bomb ploy posed the greatest risk of nuclear war since the 1962 Cuban missile crisis. State Department officials traveled to Poland to ensure that medical supplies and radiation equipment were rushed over the border. The Energy Department sent equipment to collect potential debris so that it could be later analyzed by American scientists for weapon design characteristics and the origin of the nuclear material. U.S. Strategic Command, which oversees nuclear operations, directed a team of experts (cheekily named The Writers' Club, because their findings were written up daily for the Pentagon leadership) to assess the risk and determine which conditions would trigger Russia to go nuclear.

While cautions about the potential withering economic, diplomatic and military consequences were delivered in private to Moscow, administration officials also publicly sounded alarm bells.



DEFENSE SECRETARY LLOYD AUSTIN, OCTOBER 2022

The administration's diplomatic push was coupled with efforts by leaders of several nations, including China, India and Turkey, to explain to Mr. Putin's government the potential costs if he were to go through with a nuclear attack. That November, the director of the Central Intelligence Agency, William J. Burns, met with his Russian counterpart in Turkey, where he conveyed a similar warning. On Nov. 16, the Group of 20 released a joint statement:



If the Russian leader was indeed inching toward the brink, he stepped back.

IMAGINE THE DAMAGE
THE WEAPON WOULD WREAK
ON PEOPLE AND
THE ENVIRONMENT.

The toll of a 10-kiloton blast on a military target near a city could be thousands dead, even more wounded. Roads, tunnels and railways are impassable because of debris and destruction. It might be days before rescue workers can venture safely into affected areas.

Cell towers and utility poles are knocked over and disconnected, causing widespread power failures. The electromagnetic pulse released from the detonation cripples electronic equipment within roughly a one-mile radius from the epicenter.

The thousands of unburied dead, the open sewage and the fetid water are a breeding ground for disease and growth in insect populations that have a higher tolerance than humans for radiation. Flies appear en masse, laying eggs in corpses and the open burn wounds of survivors.

The debris churned up by a nuclear blast, along with soot and ash from the raging fires, falls back to earth as thick, black water droplets laced with radioactive material. Black-rain showers can fall miles away from ground zero, staining nearly everything they touch.

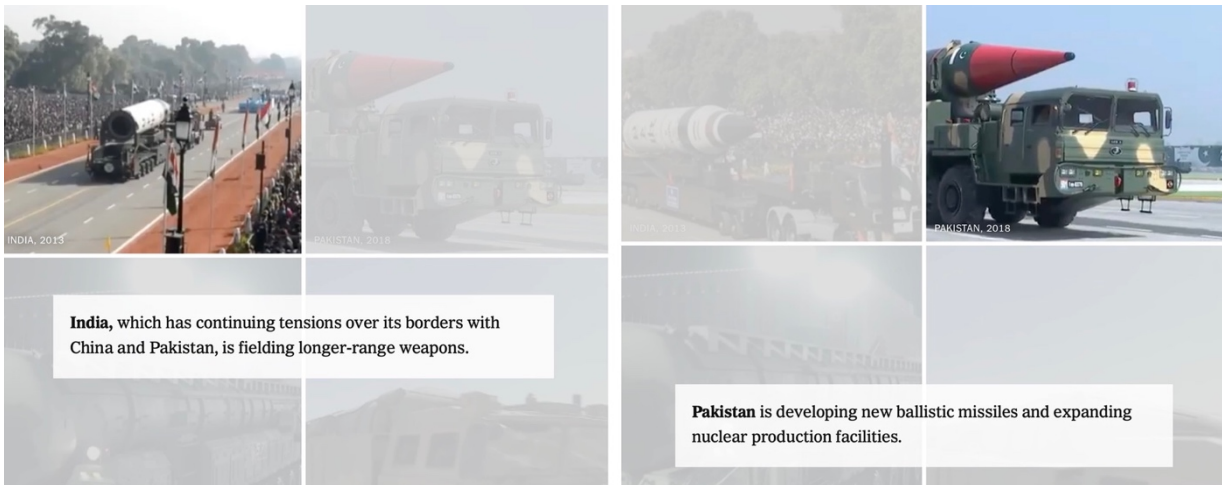
Radiation sickness begins with bouts of nausea, vomiting and diarrhea. Days or weeks after exposure, people who look fine can suddenly lose hunks of hair, become anemic and weak, and begin bleeding internally. Their immune systems can fail, rendering them helpless against the infectious diseases that start to spread: dysentery, typhoid, cholera.

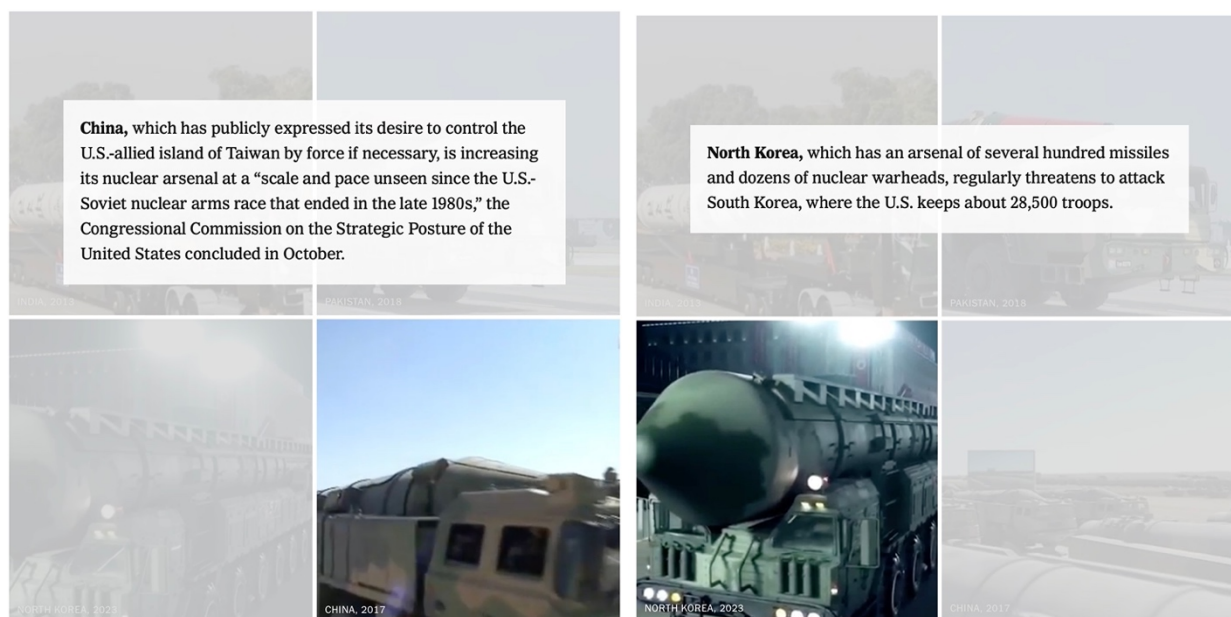
Some pregnant women who are near the blast later give birth to babies with microcephaly and other defects. Cancer of all kinds can appear decades later.

If radioactive contamination from the initial blast passes through the food chain via animals and plant roots, damage to the ecosystem can linger for years.



WHAT TOOK PLACE to prevent a nuclear attack that fall was a rare moment of consensus on an issue on which world leaders seem to be moving farther apart. Russia is replacing its Soviet-era hardware with new jets, missiles and submarines. And the other eight nations that have nuclear weapons are believed to be enhancing their arsenals in parts of the world that are already on edge.





So while Washington has been helping Ukraine prepare for a nuclear attack, Taiwan or South Korea could be next. The National Security Council has already coordinated contingency playbooks for possible conflicts that could turn nuclear in Taiwan, the Korean Peninsula and the Middle East. Iran, which has continued its nuclear program amid Israel’s war on Hamas in Gaza, has amassed enough enriched uranium to build several weapons if and when it chooses.

During this time of widening conflict, the rising nuclear threat is especially destabilizing: A nuclear explosion in Ukraine or Gaza, where tens of thousands of civilians have already been killed or injured, would sizeably escalate either conflict and its humanitarian toll.

The world has been through a version of this moment before. The last nuclear standoff during the Cold War was cooled in part because of numerous nonproliferation efforts and arms control agreements between the United States and the former Soviet Union. The two nations, recognizing the terrifying situation they were in, worked to identify weapons that were mutually menacing and simply agreed to eliminate them. Nuclear warhead numbers plummeted to 12,500 today from roughly 70,400 in 1986.

Now that shared safety net of treaties and agreements is nearly gone. After a decade of diplomatic breakdown and military antagonism, only one major arms treaty between the United States and Russia remains — New START, which Mr. Putin suspended Russia’s participation in last year. The treaty is set to expire in February 2026.



PRESIDENT VLADIMIR PUTIN, FEBRUARY 2023

That means we are just two years away from a world in which there are no major treaty limits on the number of strategic nuclear weapons the United States and Russia deploy. Already today, because of the New START suspension, the two nations disclose little information about their arsenals to each other and do not engage in talks for further agreements. If nuclear deterrence — however flawed a concept it may be — is to work, transparency about nations' capabilities is critical. Without better communication, the risk of rapid escalation and miscalculation will grow.

The danger of nuclear use in Ukraine fluctuates. It waned after Ukraine's drive to recapture territory and sever Russia's supply lines to Crimea was stopped short. But if the momentum swings back in Ukraine's favor, or if Mr. Putin feels threatened by increased Western intervention, it could rise again. A U.S. intelligence report declassified late last year estimated Russia had lost around 315,000 troops to death or injury in Ukraine since 2022. That's nearly 90 percent of its prewar force, along with at least 20 warships, thousands of battle tanks and heavy weapons — all major losses that could create more dependency on its tactical nuclear arsenal.

**IMAGINE THE RIPPLE
EFFECT OF ONE NUCLEAR
WARHEAD ON THE
WORLD — ON WHERE
PEOPLE LIVE, WHAT
THEY EAT, THEIR SENSE
OF SAFETY.**

Few nations on earth are unaffected. If the strike happens in a country like Ukraine, among the largest grain-exporting nations in the world, the impact spreads quickly. The attack prompts an agricultural embargo to contain potentially contaminated crops, creating a domino effect of food shortages that spread across the Middle East, South Asia, North Africa and West Africa.

Fear is as dangerous as contamination itself: Panic over radiation exposure and its long-term effects drives people from their homes, regardless of whether the threat in their community is real or not. Border crossings are quickly overrun.

Anxieties over a wider nuclear war immediately spike, causing the New York Stock Exchange to plunge. Lockdown orders trigger a rush on groceries, wiping markets' shelves clean.

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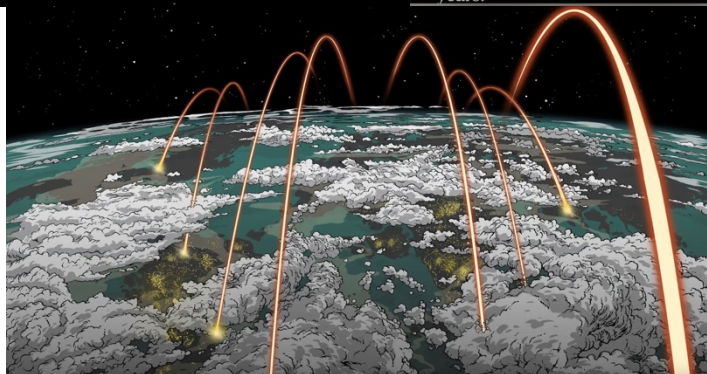
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consequences. But the response might not be nuclear. It could be a devastating aerial bombardment aimed at Russia's naval fleet, or Washington could decide to target a base in Belarus, where Russia has recently deployed nuclear weapons, avoiding a direct attack on Russian territory.

A tit-for-tat escalation, once touched off, is difficult to stop. If the end result was a thermonuclear exchange between nuclear powers, like the U.S. and Russia, the impact on humanity would be swift and long-lasting.

Even a limited nuclear war could be catastrophic. A 2022 scientific study found that if 100 Hiroshima-size bombs — less than 1 percent of the estimated global nuclear arsenal — were detonated in certain cities, they could generate more than five million tons of airborne soot, darkening the skies, lowering global temperatures and creating the largest worldwide famine in history.

An estimated 27 million people could immediately die, and as many as 255 million people may starve within two years.



THIS ISN'T AN easy time for adversaries to be making big leaps of faith, but history shows it's not impossible to forge deals amid international crises.

The Limited Test Ban Treaty, which prohibits nuclear tests in the atmosphere, in space and underwater, was signed by the United States, Britain and the former Soviet Union in 1963, less than a year after the Cuban missile crisis. Negotiations over the first Strategic Arms Limitation Talks, which froze the number of American and Soviet long-range, nuclear-capable missiles, were concluded less than two months after the United States bombed Haiphong Harbor in Vietnam in 1972, damaging some Soviet ships. Several close calls in Europe during the Cold War contributed to a sweeping collection of agreements between Washington and Moscow that capped the number of each nation's strategic weapons, opened communication channels and amplified monitoring and verification measures.

China's aggressive nuclear buildup has complicated the strategic balance of the Cold War, raising questions in the United States about how to handle a three-way competition. In June, Jake Sullivan, President Biden's national security adviser, publicly offered to hold nuclear arms control negotiations with Russia and China — one-on-one or multilaterally — without preconditions. The proposal has resulted in only preliminary discussions with the Chinese and was met with outright dismissal from the Russians, according to administration officials.

Nuclear arms treaties typically take months or years to negotiate. And while the agreements don't solve everything, they do allow governments to gain insights and assurances about an adversary's stockpile that they otherwise wouldn't have. Left in the dark, governments are forced to plan for the worst, building offensive and defensive capabilities.

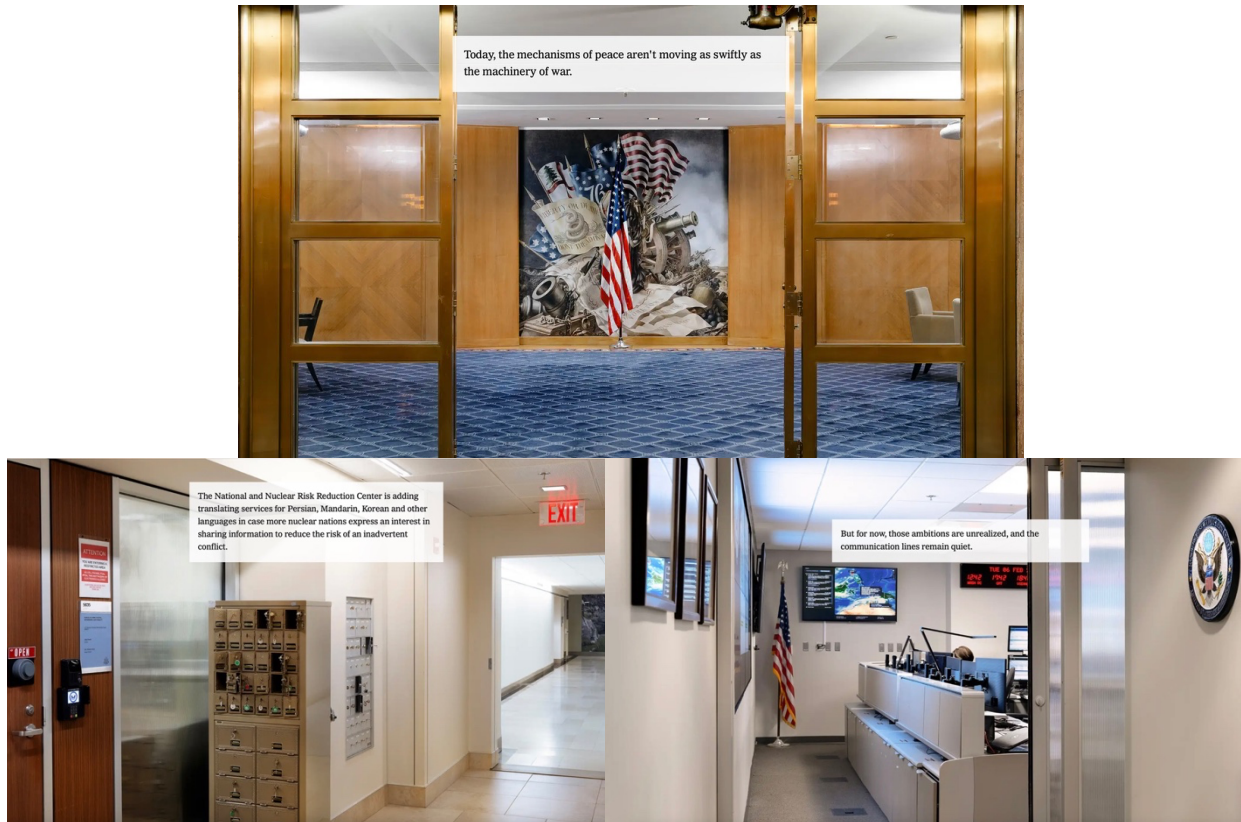


The United States is now preparing to build new nuclear warheads for the first time since 1991, part of a decades-long program to overhaul its nuclear forces that's estimated to cost up to \$2 trillion. The outline of that plan was drawn up in 2010 — in a much different security environment than what the country faces today. This administration, or the next one, could make the political case that even more weapons need to be built in response to the expansion and modernization of other nations' arsenals, particularly Russia's and China's.

BEHIND A NONDESCRIPT door on the fifth floor of the State Department building in Washington, down the hall from the former offices of the director of the Manhattan Project, a windowless control room provides a direct channel between the world's two biggest nuclear powers.

The National and Nuclear Risk Reduction Center was established in 1988 as a 24-hour watch station to facilitate the information exchange required by various arms control treaties and security-building agreements, mostly between the United States and Russia.

With a Russian translator always on the floor, the center once buzzed with more than 1,000 messages a year regarding the testing, movement and maintenance of Russia's weapons, missiles and bombers. Last year, after the abandonment of New START, the center received fewer than a dozen of those messages.



This is the first piece
in the new Opinion series,
At the Brink, about the
modern nuclear threat. Listen
to an audio adaptation.
Read the introduction to the
series by Opinion editor
Kathleen Kingsbury.

W.J. Hennigan writes about national security issues for Opinion from Washington, D.C. He has reported from more than two dozen countries, covering war, the arms trade and the lives of U.S. service members. Additional reporting by Spencer Cohen. A selection of sources consulted in reporting this project can be found [here](#).

National and Nuclear Risk Reduction Center photographed by An-My Lê for The New York Times. Illustrations by Tim McDonagh. Animation by Jil Tai. Phone call: Robert L. Knudsen/U.S. National Archives and Records Administration (test ban). Treaty photos: Corbis/Getty Images (SALT); Bettmann/Getty Images (INF); Joe Klamar/Agence France-Presse — Getty Images (NEW START). Videos: The Union Herald, via YouTube; RTVI News, via YouTube; CGTN, via YouTube; Global News, via YouTube; Pakistan Armed Forces, via YouTube; AFP, via YouTube.

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