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Al-Qaeda and WMD Terrorism: Has the Worst Case Returned?

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Al-Qaeda and WMD Terrorism: Has the Worst Case Returned?

By the time US forces entered Afghanistan in the immediate aftermath of 9/11, it was almost too late. In al-Qaeda compounds, these forces found writings on biological and chemical warfare, including plans to produce mustard gas and the nerve agents VX and sarin.[1] They discovered labs where the research and development of chemical and biological agents were underway, and they found videotapes of experimentation with cyanide-based nerve agents.[2] The United States also uncovered al-Qaeda ties with Pakistani nuclear scientists for the purpose of acquiring or developing a nuclear weapon.[3] These findings shattered the idea that al-Qaeda's interest in weapons of mass destruction (WMD) was theoretical or exaggerated. Indeed, they demonstrated that the group's chemical, biological, radiological, and nuclear (CBRN) programs had already begun.

Al-Qaeda's work on WMD was a result of its longstanding ambition to acquire such weapons. Years before the 2001 attacks on New York and Washington, the group's leaders saw the acquisition of CBRN not as an option but as an obligation. Osama bin Laden, the group's leader, called it a "Muslim religious duty." His deputy, Ayman al-Zawahiri, oversaw the group's nuclear and biological efforts, while Anwar al-Awlaki, a leading al-Qaeda operative and propagandist, justified the use of biological and chemical agents.[4] In its writings, al-Qaeda treated WMD

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both as weapons they would use and as strategic equalizers in its asymmetric war against the West.

Today, nearly three decades later, al-Qaeda's enduring interest in WMD remains evident. Recent al-Qaeda publications reaffirm the group's continued resolve to acquire and use WMD.[5] On June 6, 2025, Ibrahim al-Qosi—known as Sheikh Khubayb al-Sudani and a senior figure in al-Qaeda in the Arabian Peninsula (AQAP)—issued a statement in the group's Arabic-language newsletter. Quoting earlier al-Qaeda propaganda from September 2023, he reiterated the organization's commitment to attacks against the United States, asserting that preparations were ongoing and intended to surpass 9/11 in impact and scale. He added that the effort, though progressing slowly, would eventually overcome US defensive measures.[6]

Three factors erode the technical barriers that once confined WMD to state actors

Importantly, that intent now coincides with a shifting operational environment: renewed safe havens, diminished US intelligence reach, and the rapid diffusion of dual-use technologies. Together, these factors erode the technical and logistical barriers that once confined WMD development to state actors. Emerging sanctuaries enable experimentation; technological diffusion accelerates access to materials and expertise; and constrained intelligence collection has weakened situational awareness.[7] As the 9/11 Commission concluded, the attacks of 2001 were, in part, the result of a failure of imagination. Today, imagining the prospect of catastrophic terrorism is getting easier, and it is time for policymakers and intelligence agencies to heed the warnings and take action.

To this end, this article proceeds in four parts. First, it revisits al-Qaeda's long history of pursuing CBRN capabilities—an effort far more advanced, global, and institutionally durable than often remembered. Second, it examines a new wave of al-Qaeda doctrinal statements and internal publications that signal renewed strategic intent among senior leaders. Third, it assesses why today's operating environment is far more permissive. Finally, the article outlines the policy steps needed to prevent strategic surprise, including restoring visibility, securing vulnerable CBRN materials, and adopting a set of innovative measures such as non-state CBRN early warning indicators, global DNA-synthesis screening standards, targeted procurement-disruption initiatives, AI-enabled forecasting models, and enhanced regional cooperation to choke off the supply chains that terrorist groups increasingly exploit. Together, these steps aim to reorient counterterrorism toward emerging forms of mass-effect terrorism.

Al-Qaeda's WMD Past

Al-Qaeda's pursuit of WMD began early. In the 1990s, the group paid $1.5 million for uranium in Sudan, which was tested in Cyprus and deemed genuine.[8] Additionally, US officials believed bin Laden "had invested in and almost certainly ha[d] access to VX."[9] In Afghanistan, al-Qaeda built labs, trained operatives in chemical and biological warfare, and recruited credentialed scientists.[10] Pakistani microbiologist Rauf Ahmed and US-trained Malaysian army captain Yazid Sufaat established a lab and obtained anthrax strains—efforts disrupted only by the US invasion.[11] Al-Qaeda also forged ties with Umma Tameer e Nau, a Pakistani NGO run by retired nuclear scientists and military officers.[12] Had the United States not dismantled al-Qaeda's Afghan sanctuary and garnered the assistance of the Pakistani government, al-Qaeda might have acquired or built a workable nuclear device.[13] According to former CIA officer Rolf Mowatt-Larssen, who led the agency's internal task force on al-Qaeda and WMD, the group's program was "far from run-of-the-mill terrorism." It was, he said, "highly compartmentalized, at the highest level of the organization. It was methodical, and it was professional."[14] Though disrupted, these efforts created a durable operational model: recruit credentialed specialists, hide them within permissive sanctuaries, and iterate toward capability.

Al-Qaeda's CBRN program was not confined to Afghanistan. It traveled, adapted, and took root in new environments. In Iraq, Abu Musab al-Zarqawi's network built ricin labs, weaponized chlorine, and in 2004 nearly executed a mass-casualty chemical attack in Jordan using 20 tons of industrial toxins.[15] In Yemen, al-Qaeda in the Arabian Peninsula (AQAP) acquired castor beans—the ingredient from which ricin is derived—and lab tools to refine ricin for attacks on the United States.[16] In Southeast Asia, Sufaat briefed senior al-Qaeda leaders on what he described as successful anthrax work and later sought to restart the program through medical lab fronts in Malaysia, with plans to relocate operations to Indonesia.[17] Once centered locally, al-Qaeda's WMD efforts had become a near-global problem.

Over time, al-Qaeda moved from experimentation to attempted operationalization. In 2002, US agents arrested José Padilla in Chicago, whom al-Qaeda tasked with building a radiological "dirty bomb" for use in the United States.[18] In the United Kingdom, police uncovered a toxin lab tied to al-Qaeda-trained Algerian Kamel Bourgass containing ricin formulas, cyanide and botulinum recipes, and castor beans intended for a mass poisoning attack.[19] Between 2003 and 2004, European authorities dismantled multiple jihadist cells with ties to al-Qaeda operatives—many found with chemical and biological weapon manuals.[20] In 2008, Aafia Siddiqui, a US-educated neuroscientist linked to

al-Qaeda, was detained in Afghanistan carrying sodium cyanide, chemical gels, and handwritten plans for attacks in New York.[21]

Why, then, has al-Qaeda never executed a successful WMD attack against the United States? It is not because the group lacked ambition, intent, or even technical capability. Rather, the United States and its allies worked relentlessly to prevent it. After 9/11, the Global War on Terror imposed sustained pressure on al-Qaeda's ability to plan, experiment, and execute. Intelligence services dismantled labs, disrupted plots, eliminated technical personnel, and decapitated leadership. As former Acting CIA Director Michael Morell noted, "The absence of any al-Qaeda attack, including a WMD attack, on the Homeland in the aftermath of 9/11 was due more than anything else to the work of the USG, particularly CIA and NSA." He added that it was "even possible that the work of the U.S. Intelligence Community prevented al-Qaeda from acquiring a Pakistani nuclear weapon."[22]

What once prevented a WMD attack was the vigilance of the US; that vigilance has waned

That success was earned, not assumed. It depended on a level of intelligence visibility and sustained counterterrorism focus that no longer exists. As will be described further below, the systems that once constrained al-Qaeda have weakened, while the group's intent remains unchanged. It still seeks an attack that would eclipse 9/11 in both scale and symbolism. As Mowatt-Larssen put it, the group "needed something bigger and better than 9/11."[23] What once prevented it was the vigilance of the United States; that vigilance has waned. Al-Qaeda's intent has not.

Strategic Intent, Renewed

Al-Qaeda's CBRN ambitions remain as strong today as they were at any time before or after 9/11. Even after bin Laden's death, documents recovered from his compound included Iranian nuclear site maps, and recent publications by senior figures continue to reaffirm the organization's intent. In 2016, longtime al-Qaeda strategist Abu Musab al-Suri described biological agents as both tactically effective and morally justified. He proposed "infecting enemy forces with temporary viral illnesses" and advocated deploying gas via "artillery shells or low-flying aircraft."[24]

In September 2022, al-Qaeda's media apparatus released a book by the late Abu Muhammad al-Masri—al-Zawahiri's former deputy—laying out a roadmap

for CBRN development.[25] Although written in September 2020, shortly before an Israeli strike killed him in Iran, the text is significant: al-Masri drafted it while being sheltered alongside Saif al-Adel, now al-Qaeda's de facto leader.[26] The document urged jihadist groups to pursue tactical nuclear options, chemical and biological dispersal methods, and radiological sabotage—indicating that al-Adel was likely aware of, and involved in shaping, these plans. "Al-Qaeda is seeking to acquire tactical nuclear weapons to use them on American soil," al-Masri wrote, or to "crash a fuel-laden aircraft near a nuclear reactor" to inflict comparable harm. He argued that WMD had "catastrophic effects" and were weapons jihadists "must strive to possess," identifying Israel and the United States as primary targets. He claimed that within a few years such weapons would be within reach, and "at that point, the equation will change." His prescriptions were concrete: allocate scientific budgets for weapons research, embed skilled youth in elite universities in the West and Asia, and collaborate with scientists to build private labs. Raw materials, he asserted, were "not difficult" to obtain, citing the group's access to global supply chains.

Al-Masri framed this push for WMD not as extremism, but as moral retaliation. He argued that acquiring and using WMD was not aggression, but justice. "No weapon is exempt, even if it is prohibited by international law," he wrote, citing US use of depleted uranium and white phosphorus in Iraq and Israel's use of banned munitions in Gaza. Al-Masri portrayed WMD use as justified retribution, recasting mass casualty attacks as legitimate responses to perceived Western crimes.[27] The same ideological currents that justified 9/11 continue to shape today's WMD ambitions.

> The same ideological currents that justified 9/11 shape al-Qaeda's WMD ambitions today

In November 2022, al-Qaeda published another document attributed to its late intelligence chief, Abu Ubaydah Abdullah al-Adam, offering guidance on acquiring chemical precursors while evading detection. He described "mini nukes" capable of destroying areas up to 50 square kilometers and echoed a common slogan in al-Qaeda manuals: "Your weapon should be the same weapon your enemy uses."[28]

In June 2023, AQAP senior figure Ibrahim al-Qosi released a revised edition of his 2021 book that included a new chapter on WMD, signaling renewed emphasis within AQAP.[29] He argued that possession of such capabilities would be necessary "to use whenever [the group] needed to," invoking long-standing figures such as Ali Sayyid Muhamed Mustafa al-Bakri—also known as Abu Abd al-Aziz al-Masri—whom 9/11 mastermind Khalid Sheikh Mohammed referred to as al-Qaeda's "nuclear chief."[30] A university-trained chemist, shura council member, and longtime

instructor at al-Qaeda's Afghan camps, al-Bakri oversaw its early chemical weapons program, underscoring the continuity of institutional expertise.

And finally, in July 2023, Saif al-Adel, al-Qaeda's de facto leader, published a book in which he addressed the psychological and tactical value of WMD. Al-Adel declared that "there is no way to deter criminals in America, Europe, Russia, and others except by possessing weapons of mass destruction." Possession, he stressed, was essential, even if "their use depended on the actions of the enemy." Al-Adel, who has long overseen al-Qaeda's CBRN efforts, emphasized WMD's psychological utility as much as their physical effect: "The terror that results from such advanced weapons deters," he wrote. He advocated "dirty wars," including poisoning wells and food supplies or contaminating them with bacteria to sicken enemy forces.[31]

Operationally, al-Qaeda has prioritized lower-barrier, high-consequence options—crude toxins, chemical agents, and pathogens—valued for their capacity to create disruption, impose economic costs, and generate political leverage. The COVID-19 pandemic provided a salient example: a single biological threat produced widespread economic and social disruption, a point al-Qaeda highlighted in its commentary. Al-Qaeda noted that "economies of major nations lie in ruin … including army and security, pinned down by an invisible enemy," and that "norms of social behavior, lifestyles, everything is being redefined."[32] For the group, CBRN capabilities function primarily as psychological and political tools within a broader strategy of asymmetric exhaustion—imposing disproportionate social and economic strain at relatively low technical cost.[33]

Low Barriers, High Consequences

While al-Qaeda's resolve has remained strong, the operational world around it has grown even more permissive. For the first time in decades, the group operates under conditions increasingly favorable to turning intent into action. The withdrawal of US and allied forces from Afghanistan and Africa has enabled a resurgence of terrorist safe havens—many now beyond effective US monitoring—while rapid technological advances have lowered the once-high barriers to CBRN terrorism.[34] What once required state labs and elite specialists is now within reach of determined actors, narrowing the gap between ambition and execution.

Waning Vigilance: Unseen and Unchecked

Al-Qaeda has reestablished sanctuaries that replicate pre-9/11 conditions, enabling movement, experimentation, and concealment. In 2024, the UN reported up to eight new training camps across Afghanistan's Ghazni,

Laghman, Parwan, and Uruzgan Provinces, with weapon stockpiles in Panjshir and safe houses in Farah, Helmand, Kabul, and Herat—all under the Taliban's watch.[35] Al-Qaeda's own writings highlight the advantages of these terrains. They offer natural air-gap protection—geographic separation that limits electronic and physical surveillance—and provide cover for sensitive work. Just as the group operated chemical and biological labs in Afghanistan before 2001, these sanctuaries now enable concealment for CBRN experimentation and insulation from detection. With this cover, the group could move beyond basic research, experimenting with radiological devices, preliminary nuclear-related components, and other sensitive materials in relative safety.[36] Reports confirm the return of senior operatives, weapon experts, and commanders to Afghanistan, while facilitators now travel freely on Taliban-issued documents, allowing skilled technicians to rotate through camps and transfer expertise.[37]

Other theaters present similarly permissive conditions. Across Yemen, East Africa, and the Sahel, the withdrawal of US, allied, and local forces has enabled al-Qaeda's affiliates to establish and expand their sanctuaries.[38] In Yemen, AQAP reconsolidated its presence across Shabwa, Ma'rib, Hadramawt, and Abyan, facilitating cross-border movement, establishing new training camps, and planning external attacks.[39] In East Africa, al-Shabaab—al-Qaeda's Somali affiliate—has similarly capitalized on troop drawdowns, reclaiming territory from southern to central Somalia.[40] These interconnected safe havens now allow unhindered logistical flows, recruitment, weapons and personnel movement, and growing transnational reach.[41] In the Sahel, recent coups and force withdrawals have provided Jama'at Nusrat al-Islam wal-Muslimin (JNIM) unprecedented territorial dominance.[42] The resulting safe havens support recruitment, weapons stockpiling, and operational planning.[43] Together, they have intensified coordination among AQAP, al-Shabaab, and JNIM, strengthening their collective capacity through the exchange of fighters, funds, and expertise.

> New safe havens and a resource shift to great power competition have reduced US intelligence visibility

Al-Qaeda's new safe havens, combined with a shift in resources from counterterrorism to great power competition, have complicated intelligence collection and led to a sharp decline in US intelligence visibility. In 2023, former Director of National Intelligence (DNI) Avril Haines admitted, "We are not able to collect as much information today as we were … when the troops were in Afghanistan." She added that intelligence collection had "definitely degraded from what we had previously." General Michael Kurilla, commander of US Central

Command (CENTCOM), echoed this: "We lack the granularity to see the complete threat picture."[44]

The shortfall extends to Africa, where coverage is fragmented and assets are limited. General Michael Langley, commander of US Africa Command (AFRICOM), warned that his forces struggle to detect when militant groups might evolve into threats against the United States or Europe. "We want to be able to monitor," he said, "to see if it metastasizes into increased capability." Additionally, a former US official told the *Washington Post* in June 2025 that "in a region where we used to monitor what was happening, we no longer have the tools."[45] These blind spots matter. Early-stage CBRN activity, such as procurement, experimentation, or movement, often leaves only faint traces. And those traces are precisely what today's intelligence environment is least equipped to detect. Al-Qaeda, which compartmentalizes such efforts by design, now benefits from the widening intelligence gap. For the first time in decades, intent, capability, and opportunity are aligning, just as oversight is eroding.

Technology: Ambition Meets Access

Just as safe havens return and intelligence collection falters, the technological threshold for CBRN use is collapsing—and terrorists appear to be breaching parts of it.[46] Once confined to state-run programs, tools like CRISPR gene-editing kits (used to precisely alter DNA), DNA synthesizers, 3D printers, and automated lab equipment are now cheap, accessible, and widely available, reducing the cost and complexity of weaponization.[47] Some CRISPR kits sell for under $150 and are marketed for home use, while commercial DNA synthesis companies operate in regions where al-Qaeda is active, with inconsistent screening for hazardous sequences.[48] Advances in synthetic biology and protein engineering platforms now make it possible to modify pathogens, enhance toxins, and even reconstruct extinct viruses. Researchers have already demonstrated this potential by using CRISPR to alter influenza virulence and increase antibiotic resistance in E. coli.[49] Even modestly trained individuals can now design pathogens or produce toxins with off-the-shelf gear.

Delivery and optimization have also become easier. Compact synthesis units and basic lab containers now reduce handling risks, while commercial drones capable of carrying 20-pound payloads are widely available and increasingly used in conflict zones.[50] Guided via GPS, these platforms can disperse aerosolized agents—anthrax spores, botulinum toxin, or engineered viruses—over water supplies or ventilation systems with plausible deniability. Al-Qaeda affiliates have already incorporated drones in conventional attacks, and groups such as AQAP, al-Shabaab, and JNIM have moved from drone experimentation to operational weaponization.[51] At the same time, online markets traffic in toxins like

abrin and ricin, and jihadist forums circulate manuals and tutorials.[52] Artificial intelligence compounds these risks: large language models can generate step-by-step instructions for producing bioagents or nerve agents, and AI-driven design tools enable pathogen optimization for greater virulence or resistance.[53] Al-Qaeda publications have already discussed exploiting these platforms for tactical gain. As political scientist Graham Allison once warned, "Terrorists have for the most part been technically challenged. Should that change, the overall picture could also change dramatically overnight."[54] Although we don't know to what extent al-Qaeda may be taking advantage of these technologies, Allison's moment may be here.

The contrast with earlier decades is stark. In the 1990s, the Japanese cult Aum Shinrikyo invested in weaponizing anthrax and botulinum toxin but failed to produce virulent strains or reliable delivery systems, turning instead to chemical agents.[55] Aum's failure reflected capability gaps rather than a lack of intent—a limitation al-Qaeda also confronted in its Afghanistan-based anthrax project under Sufaat, which had not progressed to a weaponizable agent before the US invasion. Today, however, synthetic biology, commercial manufacturing, and off-the-shelf tools have lowered the expertise and infrastructure once required, shifting what was a hard ceiling into a permeable threshold. For a group long defined by patience, these shifts represent opportunity.

Although direct evidence of active biological or chemical weaponization remains limited, several al-Qaeda affiliates are developing the operational concepts, enabling technologies, and infrastructure that would make such capabilities increasingly viable. AQAP has openly promoted CBRN ambitions and pursued unconventional external operations. In 2010, The Department of Homeland Security (DHS) uncovered an AQAP plot to slip ricin and cyanide into salad bars and buffets at US hotels and restaurants.[56] A year later, the *New York Times* reported that US counterterrorism officials were "increasingly concerned" that AQAP was attempting to produce ricin to pack around small explosives for attacks on the United States.[57]

Al-Shabaab has also pursued chemical capabilities. As early as 2013, a US indictment confirmed that three al-Shabaab operatives possessed "substantial knowledge" of the group's chemical weapons program.[58] Today, the group is 3D-printing drone frames and testing night-vision payload deliveries—technologies readily adaptable for chemical dispersal, especially given its existing chlorine stockpiles.[59] The group reportedly spends $1.8 million annually on weapons manufacturing and chemical precursor acquisition, recruits engineers to expand its capabilities, and exploits commercial supply chains to move chlorinators through the port of Kismayo in southern Somalia.[60] It has even opened a hospital complex that could plausibly function as a dual-use facility, masking toxic agents under the guise of medical operations.[61] Taken together, these developments

suggest that the enabling infrastructure for early-stage CBRN experimentation is already emerging.

Preventing Strategic Surprise

Al-Qaeda's ambitions in CBRN warfare have not faded, nor has its confidence in eventual success. Although the full extent of its progress remains unclear, internal writings suggest the group has already advanced further than many assume. In his 2022 manifesto, al-Masri claimed that al-Qaeda had "welcomed experts" to "supervise and participate" in chemical weapons development using "simple capabilities," and had made "significant strides" in nuclear research. "We have saved time in achieving our goals," he wrote, citing "a large number of highly qualified mujahideen" engaged in unconventional weapons programs.[62] That claim is not baseless. Al-Bakri remains at large in Iran alongside al-Adel, and both are US-designated global terrorists noted for their technical expertise and close collaboration.[63] Meanwhile, Yazid Sufaat, another figure in al-Qaeda's bioweapons programs, was released from Malaysian custody in 2019; his restricted residence order ended in 2021.[64] Abu Bakar Bashir—an Indonesian cleric of Yemeni descent reportedly involved in al-Qaeda's WMD committee and linked to bombings in Bali in 2002 which killed 202 people—was also released from prison in 2021.[65] Their continued freedom underscores that al-Qaeda retains the expertise to revive its CBRN program.

> Internal writings suggest al-Qaeda has already advanced further than many assume

As Morell warned in a podcast recorded with the author: "I have no doubt that [al-Adel] will want to return to the fight against the United States. And I have no doubt that he will want to kick off that renewed fight with a major attack."[66] In his book, al-Adel stressed that operational silence is not dormancy but preparation—periods to "develop and advance its weapons." He also described specialized courses and training in all sorts of weaponry and tactics enabled by new elements making progress across the network. In June 2024, he underscored this publicly by calling on foreign fighters to travel to Afghanistan and prepare for attacks on the West.[67]

New operational signals have also surfaced in recent years. In December 2022, UK authorities intercepted uranium at Heathrow Airport, concealed in scrap metal shipped from Pakistan via Oman. Although no group was formally linked, former British Army chemical weapons commander Hamish de

Bretton-Gordon remarked that it "had [al-Qaeda's] trademark and fingerprints on it."[68] In July 2024, British police apprehended an 18-year-old found with ricin and an al-Qaeda training manual.[69] Since then, al-Qaeda has continued publishing material on acquiring and deploying CBRN weapons. In September 2025, federal agents detained a 25-year-old in Oklahoma for attempting to provide 3D-printed weapons and machine-gun conversion devices to an individual he believed was acting on al-Qaeda's behalf; court filings indicate he shipped more than 100 printed firearm parts and discussed interest in developing a nuclear weapon.[70]

Despite these signals—persistent intent, reconstituted safe havens, interest in enabling technologies, and several CBRN-related arrests—it remains difficult to gauge the full extent of US government attention to this threat, especially given the absence of public warnings or senior-level statements. What is publicly visible, however, suggests that CBRN-focused counterterrorism has slipped down the list of strategic priorities. The US Intelligence Community has not mentioned al-Qaeda's CBRN threat in its annual threat assessment since 2012. As former AFRICOM commander General Stephen Townsend noted in 2023, "as we shifted [from] counterterrorism to global power competition … all things counterterrorism were deemphasized." That shift redirected resources. In June 2025, a US counterterrorism program focused on tightening travel security was canceled; by September, the Office of the Director of National Intelligence was weighing cuts to the National Counterterrorism Center (NCTC). Foreign assistance freezes have hampered frontline partners, and FBI resources have repeatedly been diverted to competing missions. Former NCTC Director Christy Abizaid warned that "as resources shift away from CT, we need to account for the sustained ability to meet the threat." In May 2025, FBI Director Kash Patel echoed this concern, and a month later, former DHS Assistant Secretary for Counterterrorism Elizabeth Neumann put it bluntly: "we're making the same mistakes we did in the lead-up to 9/11 … We are moving our eye off the ball."[71]

These warnings matter because al-Qaeda remains uniquely dangerous: it couples a doctrinal foundation for CBRN with a long record of trying to act on it. Although it has yet to succeed in a CBRN attack, its commitment to symbolic, asymmetric violence has never wavered, and unlike other terrorist groups, it retains the organizational discipline and patience to pursue long-term goals. While Washington must also anticipate threats from lone actors radicalized online and armed with synthetic-biology tools, chemical engineering know-how, or drone-based delivery systems, al-Qaeda's resolve makes it the benchmark for future CBRN planning.

Rebuilding visibility into al-Qaeda's activities in Afghanistan, Yemen, Somalia, and the Sahel is therefore a necessary first step. Following US and

allied withdrawals across Afghanistan and parts of Africa, intelligence visibility deteriorated rapidly as on the-ground networks collapsed and drone coverage receded. To fill these gaps, Washington should deepen intelligence cooperation with regional partners, invest in surveillance capabilities that do not depend on local basing, and prioritize early indicators of CBRN activity such as unexplained lab construction, suspicious materials procurement, and technical specialists' recruitment.

Rebuilding visibility into al-Qaeda's activities in Afghanistan is a necessary first step

Second, US policymakers should lead a multinational initiative to secure vulnerable CBRN materials. Hospitals, agricultural centers, and industrial facilities in conflict zones store chemical, biological, and radiological agents that could be weaponized with minimal modification. A targeted program to inventory, secure, or neutralize these materials—expanding the Cooperative Threat Reduction (CTR) model to non-state CBRN risks—would help deny terrorists access to critical precursors. As part of this effort, Washington should establish a joint US-Gulf CBRN Prevention Forum to secure dual-use imports, enhance port scanning, and counter the recruitment of technical specialists. Prevention, therefore, requires not only tracking networks but anticipating how technological diffusion is reshaping the broader threat landscape.

Beyond restoring visibility and securing vulnerable materials, the United States must adopt a more anticipatory, innovative posture toward emerging CBRN risks. Washington should establish a dedicated early-warning fusion cell for non-state CBRN activity, integrating intelligence from the CIA, NCTC, Department of Energy (DOE), FBI, Defense Threat Reduction Agency (DTRA), and DHS. In parallel, the UN Security Council's ISIL and al-Qaeda Sanctions Monitoring Team should provide more regular reporting on CBRN-related risks and trends to raise global awareness. Washington should also lead a global DNA-synthesis screening consortium to standardize sequence-screening practices and close regulatory gaps across Asia, the Middle East, and Africa. Additionally, the United States could embed biosecurity and AI specialists within federal agencies to red-team potential attack pathways and identify supply-chain vulnerabilities, while pursuing procurement-disruption efforts targeting the logistical networks—from Oman and Djibouti to Somaliland and Kismayo—that AQAP, al-Shabaab, and JNIM exploit.

Washington must also strengthen the broader ecosystem for CBRN prevention. It should support universities and research institutes in high-risk regions with biosafety training, vetted equipment, and alternative funding for scientists

vulnerable to recruitment by jihadist networks. The United States should also develop a specialized sanctions regime targeting CBRN enablers—including chemical suppliers, drone manufacturers, DNA-synthesis firms, and logistics brokers—and invest in AI-driven forecasting models that integrate bioscience trends, supply-chain anomalies, and affiliate capability trajectories to anticipate when and where CBRN intent may converge with opportunity. Senior officials should publicly warn about evolving CBRN risks to build societal understanding and sustain the support and resources required for prevention.

Taking these steps will not be easy. The US national security apparatus is stretched thin, public attention is fragmented, and the political calendar is relentless. But a successful CBRN attack would dwarf the political consequences of inaction. For two decades, extraordinary efforts by US professionals have spared the country a second catastrophic attack. That success was not inevitable; it was earned through vigilance, imagination, and sustained action. The same urgency is needed now to prevent the next catastrophe.

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