



## **The Wide Spectrum of North Korea's Weapons of Mass Destruction**

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**EXECUTIVE SUMMARY:** In parallel with its growing offensive nuclear capabilities, North Korea possesses fully operational, extensive arsenals of chemical and biological weapons. Pyongyang's possession of these weapons, which are intact and ready for use, has serious implications, some of which pertain to Iran and Syria.

The US Defense Intelligence Agency recently estimated that North Korea might possess up to 60 nuclear warheads. There are different estimates as to the segmentation of this inventory in relation to various delivery systems, but it is clear that Pyongyang's objective is to establish the capacity to bring the entire US within range of its ballistic-nuclear ordnance. South Korea and Japan are almost certainly completely covered.

Pyongyang has already achieved partial coverage of US territories. Last June, in a hearing before the US House Armed Services Committee, the head of the US Missile Defense Agency, Vice Admiral James Syring, said: "The advancement and demonstration of technology of ballistic missiles from North Korea in the last six months have caused great concern to me and others. It is incumbent on us to assume that North Korea today can range the US with an ICBM carrying a nuclear warhead."

This particular endeavor was likely assisted by Tehran. A February 2016 report by the Congressional Research Service concluded, "Iran has likely exceeded North Korea's ability to develop, test, and build ballistic missiles." Tehran might be, and probably is, helpful to Pyongyang with respect to technological aspects of the nuclear sphere as well.

The nuclear component within the spectrum of North Korea's weapons of mass destruction (WMDs) is evidently growing. The big question is whether the country's despot, Kim Jong-un, will be the first person to use nuclear weapons since 1945.

Quite recently, Kim elected to employ a highly lethal chemical weapon, the nerve agent VX, for a political assassination. This weapon was used last February by two female operatives, one Indonesian and the other Vietnamese, to murder Kim Jong-un's estranged half-brother, Kim Jong-nam, in Malaysia. The victim died shortly after being assaulted by the two women, who wiped VX on his face as he prepared to board a flight to the Chinese territory of Macau. Traces of VX were revealed on swabs taken from his eyes and face.

This deadly chemical agent was probably smuggled from North Korea to Malaysia, which in and of itself was an intriguing and risky move. Six of eight potential suspects were from Pyongyang's Ministries of State Security and Foreign Affairs. The suspects flew from Kuala Lumpur on the day of the assassination, passing through Vladivostok on their way back to Pyongyang. South Korea's request to detain four of the suspects was rejected by Russian officials on the grounds of lack of evidence.

It can be assumed that Kim Jong-un was in on the plot from its inception. Symbolically, at least, this political assassination by VX can be regarded as an indication of Pyongyang's chemical weapons (CW) capabilities. Whether the regime intended it to or not, the assassination signaled the readiness, usability, and deployability of North Korea's VX, which can be used for guerrilla warfare, chemical terrorism, or wide-scale chemical attack.

VX is also weaponized within warheads carried by ballistic missiles in Pyongyang's vast CW arsenal. The North Korean ballistic program constitutes the principal, though not the only, vehicle for all three WMD programs. The CW and biological weapons (BW) programs are fully matured and have marked operational offensive capabilities. Inadequate attention is being paid to Pyongyang's large-scale offensive capacities in terms of CW and BW, but the VX political assassination incident was a wake-up call (if unintentional).

If a violent conflict arises with North Korea, the menace of non-nuclear WMD is real, whether or not a nuclear confrontation occurs. Pyongyang's concrete CW and BW capabilities and related alignments ought to be monitored meticulously, in conjunction with its nuclear capability.

In East Asia, Japan is seriously threatened by North Korea, as is South Korea. At a parliamentary panel on national security, Japan's Prime Minister Shinzo

Abe warned that Pyongyang might already be capable of firing missiles tipped with warheads containing the sarin nerve agent toward Japan. It can be assumed that he had concrete knowledge of what he was talking about and that his worry was genuine.

VX and sarin constitute but two of the chemical warfare agents comprising a vast toxic stockpile possessed by Pyongyang. That stockpile also contains mustard gas, lewisite, phosgene oxime, and other agents. North Korea is believed to have 2,500-5,000 tons of chemical warfare agents. Its annual production capacity, though, is 4,500 tons in peacetime and 12,000 tons in wartime.

South Korean experts estimate that Pyongyang has four military bases equipped with CW, 11 facilities where CW are produced and stored, and 13 dedicated research and development facilities.

It is the immensity of both the CW and BW programs that chiefly distinguishes them. The BW program is under the control of the country's top geneticist, Dr. Yi Yong Su. The biological inventory is believed to include highly virulent influenza viruses, smallpox, Korean hemorrhagic fever, yellow fever, anthrax germs, plague, cholera, and typhoid. Specific facilities have been identified that deal with influenza and anthrax, with eight installations engaging in the production of highly virulent influenza viruses.

Institute 398 is the most prominent of these facilities. Located at Singam-Ri, south of Pyongyang, Institute 398 is heavily ringed by military units. All that is visible above ground is a cluster of concrete-block buildings and fuel storage tanks. The laboratories, including two dealing with the latest molecular biology technology, are hidden far below ground. BW field tests are being conducted on the island territories belonging to North Korea, and political prisoners are used for live biological experiments.

The weaponization of BW agents has been linked to several facilities, such as the Germ Research Institute, the Central Biological Research Institute, the so-called Military Biodefense Unit, the No. 5 Factory, and the Bio-Technical Institute. The last facility, a factory ostensibly for the production of an agricultural bioinsecticide, actually produces weaponized anthrax. This facility was visited by Kim Jong-un in 2015, where he was photographed by North Korean television posing with advanced lab equipment and military personnel. In a further demonstration by the ruler last August, he paid a visit to the Chemical Material Institute of the Academy of Defense Science, a highly advanced institute that mainly deals with missiles, including those with chemical and biological warheads.

But in general, the regime tends towards concealment. With the object of forming extremely scattered alignments that can scarcely be identified let alone monitored, there are about 1,500-3,000 North Koreans and 25-30 entities involved in the BW program; 3,500-5,000 people and 25-50 entities involved in the CW program; and about 9,000-15,000 people and 100-150 entities involved in the research, development, testing, and production of nuclear weapons.

Research, development, and production of North Korean CW and BW are conducted by two organizations subordinate to the Korean Workers' Party Munitions Industry Department: the Second Academy of Natural Sciences and the Second Economic Committee's Fifth Machine Industry Bureau, which controls all facilities and sub-facilities where CW and BW are produced. Both organizations receive cooperation and assistance from the Korean Academy of Sciences and the Korean People's Army. The academy's Third Machine Industry Bureau produces artillery shells, the Fourth missile warheads, and the Seventh air-delivered weapons.

A few years ago, the North Korean arsenal was estimated to include about 150 chemical warheads plus several dozen biological warheads for ballistic missiles. It should be assumed that most of the missiles Pyongyang possesses and is currently developing are intended to carry chemical and biological warheads, among others.

An additional major delivery tool for Pyongyang's CW and BW payloads reportedly consists of 300 to 400 unmanned aerial attack vehicles. Parts of this fleet can reach Seoul, the South Korean capital, within one hour. Another item in Pyongyang's inventory is aerial bombs filled with CW and BW agents. Perhaps the most ominous potential deployment of CW by North Korea is via artillery shells and rockets containing chemical agents. Such ordnance, which is already amassed adjacent to the demilitarized zone along the border with South Korea, could in theory be put to use at a moment's notice. Pyongyang could use these weapons to strike Seoul within half an hour of war's breaking out, or indeed as a preceding move.

It has also been assessed that epidemic BW agents are likely to be dispersed by Pyongyang's Special Operations Forces through a secret attack in the enemy's rear, whether that enemy be South Korea, Japan, or the US. Such a worrisome scenario could take place prior to, during, or irrespective of a military confrontation. Brig. Gen. (ret.) Woon Goh, former Chemical-Biological-Radiological Defense Commander of South Korea, recently pointed out the likelihood of BW and CW being used by North Korea and the preparedness of South Korea for such events, particularly in terms of coping with a biological attack.

Within the framework of the recent massive US-South Korean joint military exercise, a two-day drill simulated an assault on Pyongyang's CW laboratories. The collaborating forces stormed an imitation village loaded with sarin gas facilities. At the same time, South Korean police and military units conducted a large-scale exercise on coping with a chemical terrorism attack by Pyongyang on a central subway station in Seoul. It is of note that the US Army 23rd chemical battalion, which left South Korea in 2004 and returned in 2013 to support the South Korean military and US troops based in the South, participated in these exercises.

Last June, the US Department of the Army Headquarters issued a 70-page manual on "Combined Arms Countering Weapons of Mass Destruction" possessed by "actors of concern." Its object is to "curtail the research, development, possession, proliferation, use, and effects of chemical, biological, radiological and nuclear weapons, related expertise, materials, technologies, and means of delivery."

Of concern as well are two intercepted shipments of CW or related components that originated from the Korea Mining Development Trading Corporation (KOMID), Pyongyang's primary arms dealer and main exporter of goods and equipment related to ballistic missiles. The consignees were Syrian entities designated by the EU and the US as front companies for Syria's Scientific Studies and Research Centre (SSRC; also named CERS), an entity previously identified as having cooperated with KOMID on prohibited item transfers.

Key Iranian authorities were also involved. Iran is certainly aware of, if not actively encouraging, North Korean military deliveries to Syria, including CW. Iran is building a Scud missile factory near the city of Baniyas, south of Latakia, in an area seen as a bastion of support for the embattled Assad regime. The inconclusively specified Syrian installations recently bombed in the Masyaf military compound represent a similar conjunction, largely controlled by the Iranians – possibly with North Korean involvement – of a highly classified offshoot of the SSRC. The installations in Masyaf, which have been closely monitored for several years, are believed to contain secret, uninspected sections linked to CW and to advanced surface-to-surface missiles and rockets.

Collectively, the wide spectrum of Pyongyang's WMD, apart from its geostrategic relevance to East Asia and in relation to the US, has meaningful hidden interfaces with Syria and Iran. Those ongoing interfaces consist of the transfer of knowhow, components, or weaponry 1) between Pyongyang and Tehran regarding the nuclear, chemical and biological spheres; 2) from North Korea to Syria regarding the chemical and biological spheres; and 3) from Iran to Syria regarding the chemical and biological spheres. In addition, Iran may

be using the uncontrolled land pathways it now occupies to and from Syria rather than only the airways for dispatches between Iran and North Korea.

For many years, Pyongyang has been technologically supporting the weaponization of CW and BW agents via various delivery systems in both Iran and Syria, and has built factories for that purpose. The full scope of those activities is not clear, as they are mostly covert. As one example, in 2012, Pyongyang apparently supplied Iran and Syria with genetically modified BW agents intended for weaponization.

Obviously, the North Korea-Iran-Syria interface ought to be meticulously monitored. In certain respects, Iranian knowhow and technologies are better than those of North Korea, so it can be of consequential assistance to Pyongyang. If not properly monitored, that assistance could result in undesirable developments taking place without warning.

As for North Korea itself, the conflict over restraining its nuclear program is intensifying – but its CW and BW arsenals are unfortunately likely to remain intact and ready for use.

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