

# Assessing North Korea's Chemical and Biological Weapons Capabilities and Prioritizing Countermeasures

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*Assessing North Korea's Chemical and Biological Weapons Capabilities and Prioritizing Countermeasures*

Testimony of John V. Parachini<sup>1</sup>  
The RAND Corporation<sup>2</sup>

Before the Committee on Foreign Affairs  
Subcommittee on Terrorism, Nonproliferation and Trade and the Subcommittee on Asia and the Pacific  
United States House of Representatives

January 17, 2018

**A**ny conflict on the Korean peninsula could entail the use of chemical or biological weapons (CBW), including a conflict short of a nuclear exchange. For this reason, it is important not to let attention to nuclear weapons cause us to overlook these other potentially lethal threats, to assess the extent to which North Korea may have these capabilities, and evaluate the threat they may pose. In addition, the use of CBW could easily escalate a conflict to the nuclear level. However, it is important to not exaggerate the threat that CBW present. In one of the heavily armed regions of the world, underestimation or overestimation of a threat can skew precious resources and leadership time one way or another, and prioritizing the threats of different weapons categories is essential. Clearly, nuclear weapons are our greatest concern, but calibrating how CBW and conventional weapons factor into the current military standoff or raise the threat of war is more important today than it has been since the end of the Korean War.

Information about North Korea's CBW capability is incomplete. What information is available has changed over the years and has come from various sources, some of which are indirect and difficult to validate and are shrouded by the North Koreans' skill at denial and deception. There are some parallels with what we knew about Iraq's weapons of mass

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destruction (WMD) programs before 2003. In the Iraqi case, we knew a good deal about the past programs, but not much about the state of the program at the start of the 2003 military operations. In contrast, in the North Korean case, we don't know much about the past, and sourcing on the present is far from certain.

In this statement, I draw on unclassified sources to outline what we believe we know about North Korea's CBW capabilities, how they might be employed in a conflict, the prospect that North Korea may share these capabilities with others, and possible countermeasures that the United States and the international community should consider to reduce these capabilities and the motivations to use or transfer them.

Calibrating the threat of North Korean CBW capabilities is important for allocating precious U.S. and allied resources. It is important to hedge against even low-probability threats if they have high consequences. Any military capability may escalate to the nuclear precipice. U.S. and international community efforts should therefore aim to reduce the possibility for North Korea to use CBW capabilities because of their potential to escalate military operations to a nuclear level as well as the mass death CBW may cause if used against heavily populated areas.

## Information Sources on North Korean CBW Capabilities

We know far less about North Korea's chemical and biological programs than its missile and nuclear programs in part because we have fewer and less-reliable sources of information. Unlike nuclear tests, which generate seismic signatures, and missile launches, which can be detected via a variety of technical collection methods, CBW acquisition, production, and testing can be hidden in legitimate industrial infrastructure. For the most part, North Korea's nuclear and ballistic missile activities are overt and generally conducted from known facilities. For chemical and biological weapons, acquisition is difficult to discern because the equipment and material can also be used for industrial and commercial activities. Production of CBW agents can appear to be legitimate industrial operations; legitimate industrial operations can also be converted to the production of warfare capabilities comparatively easily.

## North Korean Chemical Weapons Capabilities: A High Priority Threat

North Korea is believed to have a varied and robust chemical weapons arsenal. The consensus view is that North Korea initiated its work on chemical weapons in the 1960s and began producing them in volume in the early 1970s.<sup>3</sup> Most estimates indicate that North Korea's chemical weapons arsenal contains nerve agents, blister agents, blood agents, choking agents, and riot-control agents. Estimates of the amount of North Korea's stockpile of chemical weapons range from 2,500 to 5,000 tons. This figure has not changed in over a decade,

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<sup>3</sup> International Crisis Group, "North Korea's Chemical and Biological Weapons Programs," *Asia Report*, No. 167, June 18, 2009. As of January 15, 2018: <https://www.crisisgroup.org/asia/north-east-asia/korean-peninsula/north-korea-s-chemical-and-biological-weapons-programs>

which raises some questions about its accuracy.<sup>4</sup> Delivery methods are believed to include artillery projectiles, various types of rockets, aircraft, ballistic missiles, and naval weapons systems.<sup>5</sup>

Many analysts assess that North Korea would use its chemical weapons to gain a quick strike advantage in the early stage of a ground conflict or as a retaliatory measure if the regime was on the verge of defeat. In this scenario, North Korea would use chemical weapons to degrade South Korean and U.S. forces' ground operations and terrorize the civil population in South Korea. Depending upon the intensity of the conflict, North Korea might also launch ballistic missiles with chemical payloads against U.S. air bases in the region to suppress U.S. air support to combat operations on the Korean peninsula.

The recent killing of Kim Jong-Un's half-brother, Kim Jong Nam, with some form of VX nerve agent in Malaysia's Kuala Lumpur airport provides further information about the prominence of North Korea's chemical arsenal.<sup>6</sup> Assassinating a regime adversary in such a public place with a chemical warfare agent may have been meant to send a message to the international community about the regime's chemical weapons arsenal and its willingness to use it. There are many ways to carry out assassinations, and countries have assassinated people with chemicals and toxins in the past. However, the use of this exotic military warfare agent VX amid tensions on the Korean peninsula could also have been a signal by the regime that it has capabilities short of nuclear weapons and is prepared to use them.

## North Korean Biological Weapons Capabilities: A Heavily Latent Threat

North Korea's biological weapons capabilities are the least well known and understood of the its unconventional weapons. There are several reasons we know so little about the regime's biological weapons capabilities. First, the regime may be better able to hide these activities in comparison to its nuclear and missile activities because of their dual-use nature. Second, the regime may have never pursued a biological weapons capability to the same extent as other capabilities because of the difficulty of managing an effective program. Third, the majority of the regime's resources may have been allocated to other components of its military, and the program is not as big or is non-existent. And finally, because of the abhorrent nature of this category of weaponry, the regime may be more inclined to very closely hold the program as secret.

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<sup>4</sup> For an excellent review of issues associated with the sourcing on North Korea's chemical and biological weapons programs see Elisa D. Harris, "Threat Reduction and North Korea's CBW Programs," *The Nonproliferation Review*, Fall-Winter 2004. See also Sonia Ben Ouagrham-Gormley, "Potemkin or real? North Korea's biological weapons program," *Bulletin of the Atomic Scientists*, July 18, 2017. As of January 15, 2018: <https://thebulletin.org/potemkin-or-real-north-korea-s-biological-weapons-program10957>.

<sup>5</sup> International Crisis Group, 2009; See also Joseph S. Bermudez, Jr., "North Korea's Chemical Warfare Capabilities," *38 North*, October 10, 2013. As of January 15, 2018: <http://www.38north.org/2013/10/jbermudez101013>; and Kyle Mizokami, "Everything You Need to Know: North Korea's Chemical Weapons Are No Joke," *National Interest*, August 10, 2017. As of January 15, 2018: <http://nationalinterest.org/blog/the-buzz/everything-you-need-know-north-koreas-chemical-weapons-are-21849>.

<sup>6</sup> For an account of how the attack was likely conducted, see Doug Bock Clark, "The Untold Story of Kim Jong-nam's Assassination," *GQ*, September 25, 2017. As of January 15, 2018: <https://www.gq.com/story/kim-jong-nam-accidental-assassination>.

Much of the unclassified information on North Korea's biological weapons capability comes from uncorroborated sources from the 1990s, the South Korean government, or defectors.<sup>7</sup> Many of the unclassified assessments repeat one another. Most recent U.S. government unclassified threat assessments have not ascribed much to a North Korean biological weapons program; in some instances, these assessments have been inconsistent. In 1997, the Central Intelligence Agency (CIA) assessed that North Korea was "capable of supporting a limited [biological weapons] effort."<sup>8</sup> In 2005, CIA Director Porter Goss reported that "North Korea has active [chemical weapons] and [biological weapons] programs and probably has chemical and possibly biological weapons ready for use."<sup>9</sup> Since 2014, the U.S. intelligence community's unclassified assessments on biological weapons have dropped North Korea from the list of suspect programs. In 2014, only Syria was singled out.<sup>10</sup> In 2015, Director of National Intelligence (DNI) Clapper cited no state biological weapons programs of concern. The current DNI, Daniel Coats, did not mention any biological programs in his first World Wide Threat statement.<sup>11</sup> In these later years, either the program is not significant enough to mention or the information the DNI has cannot be revealed in open sessions.

In a 2012 white paper by the South Korean Ministry of National Defense (MND), Seoul assessed that North Korea "likely has the capability to produce a variety of biological weapons including anthrax, smallpox, plague, tularemia, and hemorrhagic fever virus," but the paper provides no supportive documentation or evidence.<sup>12</sup> In 2016, the MND slightly altered the language to state that "sources indicate that North Korea is capable of cultivating and producing various types of biological agents such as anthrax, smallpox, and plague on its own."<sup>13</sup> The same is true for many other countries with similar industrial infrastructure.

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<sup>7</sup> Elisa D. Harris, "Threat Reduction and North Korea's CBW Programs," *The Nonproliferation Review*, Fall-Winter 2004. See also Sonia Ben Ouagrham-Gormley, "Potemkin or real? North Korea's biological weapons program," *Bulletin of the Atomic Scientists*, July 18, 2017. As of January 15, 2018: <https://thebulletin.org/potemkin-or-real-north-korea-s-biological-weapons-program10957>.

<sup>8</sup> Central Intelligence Agency, "Report of Proliferation-Related Acquisition in 1997," last updated June 19, 2013. As of January 15, 2018: <https://www.cia.gov/library/reports/general-reports-1/report-of-proliferation-related-acquisition-in-1997.html#North-Korea>.

<sup>9</sup> Porter J. Goss, "Global Intelligence Challenges 2005: Meeting Long-Term Challenges with a Long-Term Strategy," February 16, 2005. As of January 15, 2018: [https://www.cia.gov/news-information/speeches-testimony/2005/Goss\\_testimony\\_02162005.html](https://www.cia.gov/news-information/speeches-testimony/2005/Goss_testimony_02162005.html).

<sup>10</sup> James R. Clapper, "Statement for the Record: US Intelligence Community Worldwide Threat Assessment," January 29, 2014. As of January 15, 2018: [https://www.dni.gov/files/documents/Intelligence%20Reports/2014%20WWTA%20%20SFR\\_SSCI\\_29\\_Jan.pdf](https://www.dni.gov/files/documents/Intelligence%20Reports/2014%20WWTA%20%20SFR_SSCI_29_Jan.pdf).

<sup>11</sup> Daniel R. Coats, "Statement for the Record: US Intelligence Community Worldwide Threat Assessment," May 11, 2017. As of January 15, 2018: <https://www.dni.gov/index.php/newsroom/congressional-testimonies/item/1757-statement-for-the-record-worldwide-threat-assessment-of-the-u-s-intelligence-community-before-the-ssci>.

<sup>12</sup> Ministry of National Defense, Republic of Korea, "2012 Defense White Paper," December 2012, p. 36. As of January 15, 2018: [https://www.nti.org/media/pdfs/ROK\\_2012\\_White\\_Paper.pdf](https://www.nti.org/media/pdfs/ROK_2012_White_Paper.pdf).

<sup>13</sup> Ministry of National Defense, Republic of Korea, "2016 Defense White Paper," p. 34. As of January 15, 2018: [http://www.mnd.go.kr/user/mndEN/upload/pblicitn/PBLICTNEBOOK\\_201705180357180050.pdf](http://www.mnd.go.kr/user/mndEN/upload/pblicitn/PBLICTNEBOOK_201705180357180050.pdf).

The evidence to date of a North Korean biological program is thus far not comparable to the evidence for North Korea's nuclear, missile, chemical, and conventional weapons capabilities. Defector reporting presents the most worrisome picture of the North Korean biological weapons program, but most of these reports cannot be corroborated or have been proven false.<sup>14</sup> During 2003–2004 and 2009, several defectors claimed that North Korea tested biological agents on political prisoners, but these reports are difficult to verify.<sup>15</sup> Recent defectors have been reported to have been vaccinated for anthrax, which has led some to assert that the regime has anthrax in its arsenal and is prepared to use it.<sup>16</sup>

There are reasonable explanations for these varying assessments. Over time, different analysts may have just assessed the capability differently or new information emerged that caused them to change their assessments. Alternatively, given how the regime shrouds its weapons programs in secrecy, misinterpretations could occur. Another explanation is that given the potentially high consequences of the use of biological weapons, any intelligence agency would feel the need to hedge against even the possibility that North Korea has biological warfare agents. The question is how much to hedge against this weapons capability as opposed to others.

Several independent analysts and South Korean government assessments assert that North Korea has about a dozen biological agents. Again, defectors vaccinated for anthrax and smallpox lead some to assert that North Korea has these agents and is protecting its troops with vaccinations in the event that these agents are used. This is too strong an assertion. North Korean soldiers who defect might have received such vaccinations because of the regime's own biological weapons arsenal or because the regime fears these agents may be used against its soldiers. When the U.S. military mistakenly sent live anthrax cultures to a number of labs in the United States and Osan Air Base in South Korea, North Korea asserted that this was evidence that the United States was prepared to attack it with biological weapons. Shortly after the mistaken shipment, Kim Jong-Un visited a purported biological research facility in an apparent attempt to signal that North Korea also has a biological weapons capability. While the facility was described as a pesticide plant, some assert that it could be used for biological weapons production.<sup>17</sup> This is hard to assess with confidence, based on the images released from the visit and the regime's statements.

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<sup>14</sup> Elisa D. Harris, "Threat Reduction and North Korea's CBW Programs," *The Nonproliferation Review*, Fall-Winter 2004.

<sup>15</sup> Bruce Bennett, "The Challenge of North Korean Biological Weapons," testimony presented before the House Armed Services Committee on Intelligence, Emerging Threats and Capabilities, October 11, 2013. As of January 15, 2018: <https://www.rand.org/pubs/testimonies/CT401.html>. See also Bermudez, 2013.

<sup>16</sup> Sofia Lotto Persio, "North Korean Soldier had 'Anthrax Antibodies,' Raising Concerns Over Pyongyang's Biological Weapons Plans," *Newsweek*, December 12, 2017. As of January 15, 2018: <http://www.newsweek.com/north-korean-soldier-who-defected-may-have-been-vaccinated-against-anthrax-759919>. See also Patrick Knox, "War and Pestilence: Defected North Korean soldier 'vaccinated' against Anthrax amid fears Kim Jong-un plans to use bio-Weapons to spread lethal infectious disease," *The Sun*, December 26, 2017. As of January 15, 2018: <https://www.thesun.co.uk/news/5213774/defected-north-korea-soldier-vaccinated-anthrax-kim-jong-un-bio-weapons/>.

<sup>17</sup> Melissa Hanham, "Kim Jong Un Tours Pesticide Facility Capable of Producing Biological Weapons: A 38 North Special Report," *38 North*, July 9, 2015. As of January 15, 2018: <http://www.38north.org/2015/07/mhanham070915>.

## North Korean Proliferation Brazenly Breaks International Norms

North Korea has a history of providing conventional and unconventional military capabilities to Iran and Syria.<sup>18</sup> North Korea provides this support to be “in the trenches” with other states the regime views as allies willing to buy its weaponry. Collaboration with Iran and Syria on their missile programs, Syria on a nuclear reactor, and various reports of supplying Syria with assistance on chemical weapons and defenses raise concerns that North Korea is a rogue state willing to transfer any weapons capabilities it has to allies.

These examples of North Korea’s provision of support naturally lead to worry about what it might sell or provide to others. In 2007, Israel bombed a North Korean–designed reactor Syria was building in the eastern part of the country near the Iraqi border.<sup>19</sup> It is unclear exactly when North Korea began its secret collaboration with Syria to help build a nuclear reactor. The Syrians did not acknowledge the destruction of the reactor. Syrian reluctance to acknowledge the existence of the reactor creates legitimate suspicion that it was intended for a clandestine nuclear program.

North Korea also has a history of providing conventional weapons to Hamas and Hezbollah, either directly or via Iran. In 2007 and 2012, Syria-bound ships from North Korea were interdicted in Greek and Turkish ports, and the seized items included defense chemical warfare equipment, such as protective clothing and chemical antidotes.<sup>20</sup>

Additionally, there are reports that North Korea has provided Hezbollah and Hamas with training on tunneling and equipment to build tunnels.<sup>21</sup> North Korea has built tunnels under the Demilitarized Zone (DMZ) no-man’s land, presumably to infiltrate South Korea at onset of hostilities on the Korean peninsula.

Despite North Korea’s breaches of the norm on not transferring unconventional weapons technology by helping to build Syria’s reactor and shipping chemical warfare defensive equipment, there is no evidence that it has transferred these capabilities to nonstate actors, such as Hamas or Hezbollah. Thus far, there is no open-source information that any state has transferred nuclear, biological, or chemical weapons capabilities to nonstate actors.

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<sup>18</sup> Bruce E. Bechtol Jr., “North Korea and Syria: Partners in Destruction and Violence,” *The Korean Journal of Defense Analysis*, Vol. 27, No. 3, September 2015, 277-292.

<sup>19</sup> David Makovsky, “The Silent Strike: How Israel bombed a Syrian nuclear installation and kept it secret,” *The New Yorker*, September 17, 2012. As of January 15, 2018: <https://www.newyorker.com/magazine/2012/09/17/the-silent-strike>.

<sup>20</sup> Bermudez, 2013.

<sup>21</sup> Victor D. Cha and Gabriel Scheinman, “North Korea’s Hamas Connection: “Below” the Surface?,” *National Interest*, September 4, 2014. As of January 15, 2018: <http://nationalinterest.org/feature/north-koreas-hamas-connection-below-the-surface-11195>. See also Zachary Keck, “North Korea’s Middle East Pivot,” *The Diplomat*, July 29, 2014. As of January 15, 2018: <https://thediplomat.com/2014/07/north-koreas-middle-east-pivot/>.



## Four Measures to Counter North Korea's Chemical and Biological Weapons Capabilities

None of the four measures outlined below are “silver bullets” to address the threat North Korea's CBW capabilities may pose. However, collectively, these and other measures can help to limit North Korea's warfare options, reduce their potential effectiveness against South Korea, add a new dimension to the dialogue with the regime, and re-enforce global norms against the production and use of poison, disease and bacteria as weapons.

### *Strengthen and Enforce the Recent Round of Sanctions*

The UN Security Council recently passed new sanctions resolutions that contain a number of restrictions on resources and technology and a requirement for all countries to send North Korean citizens back to their country within 24 months.<sup>22</sup> This aspect of the already robust sanctions regime is potentially quite important because the regime receives about \$200 million in remittances from citizens working overseas that it can use for its weapons programs. Additionally, there has been some concern that North Koreans living abroad are seeking knowledge relevant for North Korea's various weapons programs. While the majority of North Koreans overseas work in construction, some may be studying in weapons-relevant fields or working in positions that may contribute to the regime's intellectual capital to further its weapons programs.<sup>23</sup> Most of these North Koreans are in Russia and China. While the United States can urge these countries to comply with the sanctions requirements, U.S. influence is likely to have more effect in other countries where these North Korean citizens reside, such as Malaysia, India, or Germany.

### *Help South Korea with Chemical and Biological Defenses*

Helping South Korea bolster its chemical and biological defenses for its armed forces and its civilian population closest to the DMZ can provide deterrence by denial. That is, if the South Korean armed forces have better chemical weapons protective gear and train more to operate in a battlespace contaminated by chemical warfare agents, the North Koreans may be less inclined to use chemical weapons because of their limited effectiveness. Given the size of the civilian population, this will be difficult to do nationwide, so it should by no means be considered a solution to the threat. While North Korean chemical weapons are a more immediate threat to South Korea, additional bio-defensive measures can also serve the same purpose. There are reports that the South Korean military plans to vaccinate its forces for anthrax in 2019.

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<sup>22</sup> United Nations Security Council Subsidiary Organs, “S/RES/2397(2017),” December 22, 2017.

<https://www.un.org/sc/suborg/en/sanctions/1718/resolutions>. See also

United Nations Security Council Subsidiary Organs, “S/RES/2270(2016),” March 2, 2016. As of January 15, 2018: <https://www.un.org/sc/suborg/en/s/res/2270%282016%29>.

<sup>23</sup> Joby Warrick, “Microbes by the Ton: Officials See Weapons Threat As North Korea Gains Biotech Expertise,” *Washington Post*, December 10, 2017. As of January 15, 2018:

[https://www.washingtonpost.com/world/national-security/microbes-by-the-ton-officials-see-weapons-threat-as-north-korea-gains-biotech-expertise/2017/12/10/9b9d5f9e-d5f0-11e7-95bf-df7c19270879\\_story.html?utm\\_term=.d029793bc5f1](https://www.washingtonpost.com/world/national-security/microbes-by-the-ton-officials-see-weapons-threat-as-north-korea-gains-biotech-expertise/2017/12/10/9b9d5f9e-d5f0-11e7-95bf-df7c19270879_story.html?utm_term=.d029793bc5f1).

Improving South Korea's disease surveillance capabilities also provides a dual-use function to detect any future outbreak of a severe acute respiratory syndrome (SARS)- or Middle Eastern respiratory syndrome (MERS)-like endemic or a biological weapons attack. The United States and South Korea have cooperated on the deployment of the Joint United States Korea Portal and Integrated Threat Recognition (JUPITR) program, which provides a bio-surveillance capability that speeds up the detection of biological threats from days to hours.<sup>24</sup> The deployment of this system or some other biosurveillance system has an important dual-use benefit and should be expanded.

### *Explore Adding a No-First-Use of Chemical and Biological Weapons Pledge on the Korean Peninsula*

South Korea, the United States, the other six party talks members, or the United Nations Security Council should explore the possibility of obtaining a pledge from North Korea not to use chemical or biological weapons first. Since South Korea does not have offensive chemical or biological weapons programs, seeking a pledge of no first use is a benefit for that country. Highlighting concerns about CBW on the peninsula and how they complicate a potential conflict may encourage restraint on the part of North Korea. Since North Korea has publicly stated that it is a member of the Biological Weapons Convention when challenged about its biological weapons capabilities, there is at least some acknowledgement that these are taboo weapons. Calling upon the North Korean regime for a no-first use of chemical or biological weapons adds a new topic for discussion and re-enforces for the international community the taboo associated with these weapons.

### *Reinforce Norms Against the Production, Transfer and Use of Biological and Chemical Weapons Capabilities on the Korean Peninsula to Serve a Global Need*

North Korea may not be willing to engage in any dialogue about its actual or latent CBW any more than it has with its nuclear and ballistic missile capabilities. However, there is a broader international audience to underscore the taboo on CBW production and use. The taboo on the production and use of chemical weapons has eroded considerably in the Middle East following the Iran–Iraq war in the 1980s, Iraqi use against the Kurds in 1988, and Syrian use against regime opponents in the last five years. Introducing the idea of a no-first-use of CBW on the Korean peninsula underscores the taboo associated with these weapons. The taboo can extend beyond production and use to also include transfer to third parties.

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<sup>24</sup> Hyun-Kyung Kim, Elizabeth Philipp, and Hattie Chung, “The Known and Unknown: North Korea’s Biological Weapons Program,” *Harvard Belfer Center for Science and International Affairs*, October 2017. As of January 15, 2018: <https://www.belfercenter.org/sites/default/files/2017-10/North%20Korea%20Biological%20Weapons%20Program.pdf>. See also Kevin McCaney, “JUPITR Integrates All Threats into One Early Warning System,” *Defense Systems*, December 8, 2015. As of January 15, 2018: <https://defensesystems.com/articles/2015/12/08/army-jupitr-chem-bio-base-protection.aspx>.

## Conclusion

North Korea's actual and latent CBW capabilities are an underexamined component of the military tinderbox on the Korean peninsula. In contrast to the ways the regime has highlighted its nuclear and ballistic missile capabilities, the regime has largely shrouded its chemical and biological capabilities. The regime's chemical weapons capabilities are the priority threat to monitor and counter. The regime's biological weapons capabilities are less well understood, are less certain to be effective during warfighting, and are probably less well developed. Both weapons capabilities warrant enduring vigilance, as North Korea has proven many times that it can surprise the international community with rapid advances in capabilities.