

38 NORTH

SPECIAL REPORT

# North Korea and Biological Weapons

Assessing the Evidence



Elisa D. Harris  
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STIMSON

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## Executive Summary

North Korea's announcement that it is developing a vaccine for COVID-19 has focused renewed attention on Pyongyang's purported biological weapons (BW) program. Over the past three years, three major news stories on the North Korean BW threat have been published in the United States, most recently by *Politico* in July 2020.

This report discusses what the two countries with the greatest security interests on the Korean Peninsula, the United States and the Republic of Korea, have said publicly on the issue over the past 20 years. It also examines whether the policy responses adopted by the two governments have been consistent with concerns that North Korea has an advanced BW program, as these media reports have claimed. Five themes emerge from this review:

- Many of the terms used by the US government in discussing the possibility that North Korea and other countries are developing or possess biological weapons are highly ambiguous. This is especially true of the term “biological warfare program,” which the US has used repeatedly for decades without ever defining what constitutes such a program. However, based on a definition by United Nations (UN) inspectors investigating Iraq's BW activities, probably the most that can be said in the case of North Korea is that it *may have or have had* a BW program.
- There is a high degree of uncertainty about what the purported North Korean BW program actually entails. This is reflected in the many qualifications used by US government agencies in their public comments on the North Korean program. Even more uncertainty surrounds what is known, or what US officials are willing to say publicly, about actual North Korean stocks of biological weapons. The same uncertainty has been apparent in South Korean government reports on the North Korean BW threat over the last 14 years.
- There is a lack of consistency in the public assessments of the US and South Korean governments or between the assessments and the policy responses of those governments. The most striking US example of this is the inconsistency in the State Department's unclassified arms control reports, which have gone from charging North Korea with having a mature offensive BW program to focusing for nearly a decade simply on the DPRK's biological research and development (R&D) infrastructure to, more recently,

repeating its BW accusations from 20 years earlier. South Korea, for its part, has gone from accusing North Korea of maintaining BW facilities and stocks to referring only to BW agents the DPRK is *able* or *suspected of being able* to develop and produce.

- There have been conflicting assessments between government agencies on the North Korean BW issue. For example, after 12 years of not mentioning the subject in the annual threat assessment testimony to Congress, in 2018, the director of national intelligence (DNI) reiterated earlier statements regarding the *ability* of North Korea’s biotechnology infrastructure *to support* a BW program. However, in 2019, the DNI said nothing on the subject, even as the State Department was charging North Korea with developing, producing and possibly weaponizing BW agents.
- Most importantly, the US government has finally acknowledged what has been clear for many years—that the US has only fragmented insight into North Korea’s BW capabilities and intentions. This is, in part, a reflection of the challenges posed by collecting intelligence on facilities, equipment and materials that can be used for both civilian and military purposes. Moreover, given the closed nature of North Korean society, it is unlikely that the US or South Korean governments would know without reliable sources on the ground whether North Korea has given BW development and production a high degree of priority.

In the final analysis, North Korea may once have had and may still be pursuing a biological weapons capability. It is also possible that North Korea never moved beyond R&D on biological agents and the establishment of a biotechnical infrastructure that could support future BW production. It is also possible that the North Korean program never moved beyond planning or, whatever its previous nature, the program has essentially ended. But one thing seems clear—nothing in the official public record to date indicates that North Korea has an advanced BW program, notwithstanding media reports to the contrary.

## Introduction

North Korea’s recent announcement that it is developing a vaccine for COVID-19 has focused renewed attention on Pyongyang’s purported BW program.<sup>1</sup> In a July 2020 *Politico* article, some experts argued that the North Korean vaccine effort is a ploy to convince China, the United States and other Western governments to provide it with vaccine production equipment that instead will be used for developing and producing new types of biological warfare agents. They worry, in the words of Andrew Weber, a former Obama administration Pentagon official, that humanitarian concerns “will override any concern about indirectly contributing to North Korea’s illegal bioweapons program.”<sup>2</sup>

However, these fears are misplaced. Given the large number of vaccines rapidly being developed by the US and other countries, there is no reason to believe that export control restrictions and sanctions would be eased for North Korea to acquire technology that could be misused for BW purposes. And there is no public evidence that North Korea is trying to capitalize on the pandemic to obtain such dual-use technology. Indeed, there is nothing in the official public record to suggest that North Korea has an advanced BW program, notwithstanding media reports to the contrary.

## Media Reporting

According to Andrew Weber, around 2010, new intelligence confirmed the advanced nature of North Korea’s program as well as the vulnerability of the South Korean population and US forces on the peninsula to a “covert biological weapons attack.”<sup>3</sup> Weber and Bruce Bennett, a defense analyst at the RAND Corporation, believe that the COVID-19 pandemic could give North Korea an opportunity to acquire equipment and know-how that could enable them to develop a new, vaccine-resistant, COVID-19-like disease.

The *Politico* article was the third major news story on the North Korean BW threat in as many years, following earlier ones in *The Washington Post* and *The New York Times*.<sup>4</sup> It is worth examining more closely, therefore, what US and South Korean government sources have stated publicly on the issue, both before and after the new intelligence is said to have been received in 2010.

Official sources such as government reports and Congressional testimony are far from perfect, as demonstrated by the US government’s past failures to assess accurately whether Iraq or Libya had BW programs in the early 2000s. They did not.<sup>5</sup> But official sources are inherently more authoritative than unofficial sources, such as press or journal articles, which often are highly selective in the information they present, repeat unfounded allegations or information from other articles without trying to determine their accuracy, or rely on information from defectors or other sources whose motivation or credibility is far from clear.<sup>6</sup>

It is also worth examining what the US and South Korean governments have actually done since 2010 in order to see whether their policy responses have been consistent with concerns of an advanced North Korean biological warfare program, as the intelligence information is said to have confirmed.

## US Government Threat Assessment

In 1988, the director of naval intelligence testified that North Korea was involved in a biological warfare program.<sup>7</sup> However, it was not until the latter part of the 1990s that the issue began to receive further attention. In a report on weapons of mass destruction (WMD) proliferation in 1996, the US Department of Defense (DOD) stated that North Korea had pursued an offensive biological warfare program since the early 1960s, and that its biological research infrastructure probably gave it the ability to produce limited quantities of biological warfare agents and weapons.<sup>8</sup>

In 2001, the DOD report described this infrastructure as rudimentary, but said that it could support production of biological warfare agents like anthrax, cholera and plague. The report also stated that North Korea’s conventional munitions infrastructure could be used to weaponize biological warfare agents, and that North Korea may have such weapons available for use.<sup>9</sup>

In 2013, a new DOD report on the North Korean military threat was more guarded, ascribing what were said to be allegations of a North Korean biological warfare program to open-source reports from defectors. The report also repeated earlier statements that North Korea’s biological

research infrastructure could support an offensive BW program and that, together with its munitions industry, gave North Korea a potentially robust biological warfare capability.<sup>10</sup>

In 2015, DOD's North Korea report raised the issue of military doctrine, saying that the North may consider the use of BW an option. But the report made no mention of actual work on these weapons, noting only that North Korea was continuing to develop its capabilities for biological R&D.<sup>11</sup> The 2017 report was the same, with one important exception. After noting that North Korea's R&D capabilities could support a biological warfare program, it added that most aspects of BW research were inherently dual-use, meaning they could be used to develop both medical countermeasures and biological warfare agents.<sup>12</sup>

Most recently, a July 2020 US Army report on North Korean military tactics said it is highly likely that North Korea has done BW research and possibly produced anthrax or smallpox weapons that could be mounted on missiles targeted at regional adversaries.<sup>13</sup> The report also noted that a recent North Korean soldier who had defected to South Korea had been vaccinated against anthrax. However, the significance of this is not clear, given that the Democratic People's Republic of Korea (DPRK) follows the same vaccination policy as the former Soviet Union and Warsaw Pact.<sup>14</sup> Moreover, the US also vaccinates its forces in South Korea and the Middle East against both anthrax and smallpox, as discussed below.

As in the case of the Department of Defense, the intelligence community's public reports on the North Korean biological warfare threat have been far from definitive. In a new report on WMD technology proliferation in December 1997, the Central Intelligence Agency (CIA) said that North Korea was capable of supporting a limited biological warfare effort.<sup>15</sup> In June 2000, North Korea was described as capable of producing and delivering a wide variety of biological agents, though a year later, the language had changed to "possibly capable."<sup>16</sup>

The CIA's December 2001 WMD technology report did not mention North Korea and BW at all, but the June 2002 report returned to the subject, saying that the DPRK had pursued biological warfare capabilities since the 1960s and possessed biotechnical and conventional munitions infrastructures that could be used to support its BW efforts. Like DOD, the report also said that North Korea might have BW available for use.<sup>17</sup>

In a marked shift from two years earlier, the CIA's 2004 WMD technology report omitted this language on possible BW stocks. It also noted that North Korea had acquired dual-use biological equipment but that the country's biotechnology infrastructure was rudimentary.<sup>18</sup> And from 2008 until it was ended in 2011, the report referred only to the ability of North Korea's biotechnology and munitions infrastructure to support BW activities.<sup>19</sup>

The CIA's unclassified worldwide threat assessment testimony to Congress provided even less clarity on the issue of North Korean BW capabilities, mentioning the subject only three times since the mid-1990s. The first time was in 2004, when the CIA director testified that North Korea was enhancing its biological warfare potential, building what was characterized as a legitimate biotechnology infrastructure.<sup>20</sup>

However, just a year later, in an apparent shift, the CIA director testified that North Korea had an active biological warfare program and possibly BW ready for use.<sup>21</sup> But then nothing further was said on the subject for 12 years, until 2018, when the director of national intelligence (DNI)



testified that North Korea had a longstanding biological warfare capability, reiterating earlier statements that North Korea's biotechnology infrastructure could support a biological warfare program.<sup>22</sup> In 2019, the last year in which the unclassified worldwide threat testimony was provided, the North Korean BW issue was again omitted.

Because North Korea is a party to the Biological Weapons Convention (BWC), the US Department of State (DOS) has addressed the issue of North Korea and BW in its annual arms control compliance reports to Congress.<sup>23</sup> This report first mentioned the subject in 2001 when, like other US government agencies, DOS pointed to the potential for North Korea's rudimentary biotechnology infrastructure and munitions industry to support the production and weaponization of biological warfare agents.

However, the same 2001 report's actual compliance conclusion was more damning, charging that North Korea had a "dedicated, national-level effort to achieve a BW capability and that it ha[d] developed and produced, and may have weaponized for use, BW agents in violation of the Convention."<sup>24</sup> The report also stated that North Korea likely could produce militarily sufficient quantities of biological warfare agents within weeks, thus alluding to a possible mobilization capability.<sup>25</sup>

The 2005 compliance report offered conflicting comments on the North Korean BW issue. It said information suggested that North Korea had a mature, offensive biological warfare program and may have BW available for use. At the same time, the report acknowledged the dual-use nature of North Korea's biotechnology infrastructure, noting that North Korea's vaccine program was largely consistent with its public health needs, given the country's problems with infectious diseases.<sup>26</sup>

In 2010, the State Department compliance report dropped its claim that North Korea was violating the BWC, and in 2011 it omitted any linkage between the continued development of North Korea's biological R&D capabilities and the possible development of biological weapons.<sup>27</sup> By 2016, the report discussed only Russia, explaining that there was insufficient information to support the inclusion of other countries discussed in prior reports.<sup>28</sup>

Russia was also the only country included in the 2018 compliance report. But a different argument was made for the omission of other countries: that some elements of an offensive biological warfare program, such as research or planning activities or military doctrine, were not a violation of the BWC.<sup>29</sup> This could be interpreted as meaning that countries dropped from the arms control compliance report may nevertheless have been engaging in some biological weapons-related activities, but whether this was the case with respect to North Korea was not addressed.

The most recent State Department compliance reports, in 2019 and 2020, have come full circle to 2001, once again charging North Korea with developing, producing and possibly weaponizing biological warfare agents in violation of the BWC. The 2019 report also referred specifically to "continued intelligence reporting" that it said illustrated that North Korea has a biological warfare program that it plans to use against US & South Korean military forces. Further information was said to be provided in the classified version of the report.<sup>30</sup>

Notwithstanding this reference to intelligence reporting, other language in the 2019 and 2020 reports echoed past uncertainties, including about whether North Korea’s biological R&D capabilities are actually being used to develop BW, and whether it really has achieved what repeatedly has been called a “biological warfare capability.” Most importantly, what had been implicit for more than two decades was finally made explicit in these most recent reports: The US government has only fragmented insight into what was nevertheless called North Korea’s offensive biological warfare program.<sup>31</sup>

## South Korean Government Threat Assessment

Public South Korean government reports, particularly the Ministry of National Defense (MND) White Papers, have at times been far more specific about North Korea’s possible BW program than US reports. The MND’s 1997 White Paper traced North Korea’s pursuit of research, development and acquisition of chemical and biological weapons, and protection and detection equipment, to the early 1960s, claiming that the North maintained several facilities for producing biological weapons.<sup>32</sup> The next year, the White Paper stated that by 1980, North Korea had succeeded in developing bacteria and viruses for BW and, by the late 1980s, had completed what were called “live experiments” with such weapons.<sup>33</sup>

In 2001, the White Paper reported that North Korea was believed to hold a stockpile of 2,500-5,000 tons of chemical and biological weapons such as anthrax.<sup>34</sup> The same year, however, an MND handbook on weapons of mass destruction described the weapons stockpile as chemical only, not chemical and biological. But it also claimed that North Korea possessed one or two types of biological warfare agents and marked, but did not identify, what were said to be six research and three production facilities for BW on a map of North Korea.<sup>35</sup>

In the years that followed, the MND White Papers seemed to step back from some of their earlier claims, omitting any reference to North Korean facilities or stocks of biological agents. Instead, starting in 2006, they referred only to agents that North Korea was able or suspected of being able to develop and produce, such as anthrax, smallpox and cholera.<sup>36</sup>

## Policy Responses

In addition to examining what the US and South Korean governments have conveyed publicly about the North Korean BW issue in the years before and after new intelligence information was reportedly received in 2010, it is also useful to explore steps the two countries have actually taken to prepare for the possible use of these weapons by North Korea.<sup>37</sup>

As noted above, in 2001, the US DOD mentioned anthrax, cholera and plague as among the biological warfare agents that North Korea’s rudimentary biotechnology infrastructure might be able to develop and produce. But it was not until 2004 that a decision was made to vaccinate US forces on the Korean Peninsula, and the vaccination program focused on anthrax and smallpox.

DOD officials stated the Korea vaccination decision, as well as a related decision to expand the US military’s anthrax and smallpox vaccination program in the Middle East, were based on

an increase in the supply of the vaccines rather than indications of a greater risk of biological attack. But they also said at the time that their concerns about BW attacks against US troops had not diminished, mentioning Al Qaeda specifically.<sup>38</sup> In 2015, the Korea vaccination program was expanded to include other DOD personnel and contractors, though no other vaccines were added.<sup>39</sup>

In addition to its vaccination program, DOD also collaborated with the South Korean military between 2011-2016 on a series of joint exercises to enhance the South's ability to detect, identify and respond to a biological event. Andrew Weber has noted that these exercises were a direct response to the 2010 intelligence on North Korea's BW program and concerns about the vulnerability of US forces and South Korea.<sup>40</sup> South Korean experts have described the impetus for the exercises, known as *Able Response*, somewhat differently, explaining that recent outbreaks of Ebola and Middle East Respiratory Syndrome (MERS) had demonstrated the need for effective coordination within the South Korean government and with other governments to address disease outbreaks, whether intentional or naturally occurring.<sup>41</sup>

Finally, DOD also launched a five-year advanced demonstration project in South Korea, known as Joint United States Forces Korea Portal and Integrated Threat Recognition (JUPITR), to strengthen the biosurveillance capabilities of US forces deployed there.<sup>42</sup> Begun in 2013, the project involved new equipment for detecting and analyzing biological agents, an online pathogen library for agent identification and a sensor system for rapidly designing defensive perimeters to protect US forces and the South Korean population from biological agents.<sup>43</sup> The project was the focus of repeated protests after 2015 when the US military accidentally shipped what was reported to be live anthrax to one of the US bases in South Korea involved.<sup>44</sup>

In contrast to the United States, South Korea has done little over the past 10 years to protect either its military or civilians against the possible use of BW by North Korea. The South Korean military has not been vaccinated against either anthrax or smallpox, despite both agents having been mentioned in MND White Papers since 2006 and the US having vaccinated its forces on the peninsula.

Furthermore, the government reportedly did not even begin stockpiling vaccines until 2014, and by late 2017 had only 1,350 doses of anthrax vaccine available. At the time, a South Korean government spokesperson said that the need for anthrax vaccines had become apparent after the US anthrax shipment in 2015. He also made clear that the government would not distribute the vaccine prophylactically to protect South Koreans against the disease, as the US military had done, but would instead hold it in reserve as a treatment in the event of a BW terror attack.<sup>45</sup>

## Concluding Observations

A number of themes emerge from this review of what the US and South Korean governments have said and done in response to the purported North Korean biological warfare threat.

### ***Definitional Ambiguity***

*The first theme involves the ambiguity of many of the terms used by the US government in discussing the possibility that other countries are developing or possess biological weapons. This includes terms like “biological warfare capability,” “biological warfare potential,” and “biological warfare effort,” which, as demonstrated above, often are used by government agencies interchangeably and without explanation. Even more central to any discussion of BW threats, however, is the term “biological warfare program,” which the US government has used publicly for decades, without ever defining what constitutes such a program.*

Others, however, have offered a definition, most notably the United Nations Special Commission (UNSCOM) investigating Iraq’s biological warfare activities in the early 2000s. Under UNSCOM’s approach, a biological warfare program requires certain key elements: political will (i.e., a decision to pursue a BW program); basic knowledge of biological warfare agents, including their properties and how to safely test and maintain those properties; infrastructure, including personnel with the requisite technical know-how; delivery and weapons systems; and security and concealment measures for its facilities.<sup>46</sup>

It is not clear, based on official public information, whether North Korea has all of these elements, particularly the one that is most essential to developing and producing biological warfare agents: the supporting infrastructure and necessary personnel.<sup>47</sup> Therefore, by this definition, probably the most that can be said is North Korea may have or have had a biological warfare program.

### ***Program Uncertainty***

*A second theme is the high degree of uncertainty about exactly what the purported North Korean program entails. This is reflected in the many qualifications used by US government agencies in their public comments on the North Korean program: that the DPRK has built a biological infrastructure that *could* be used to develop and produce biological warfare agents; that it *likely is capable* of producing militarily significant quantities of such agents quickly; that its conventional munitions infrastructure *could* be used to weaponize biological warfare agents; and that North Korea *may* consider the use of BW as a military option. All but the last of these could be said of any other country with civilian biotechnology and military weapons industries.*

Even more uncertainty surrounds what is known, or at least what US government officials are willing to say publicly, about actual North Korean stocks of biological weapons: that North Korea *could* produce biological warfare agents *like* anthrax, cholera and plague; that it *possibly* has weaponized biological warfare agents; and that it *may* have BW available for use. As noted above, even after more than 30 years, the most that a recent US Army report could say about North Korea’s purported BW activities was that it is *highly likely* that North Korea has done BW *research* and that it has *possibly* produced anthrax or smallpox munitions that *could* be mounted on missiles targeted at regional adversaries.<sup>48</sup> The same uncertainty has been apparent in South Korean government reports for the last 14 years: that North Korea was *able* or *suspected of being able* to produce agents *such as* anthrax, smallpox and cholera.

### ***Inconsistent Assessments and Policy Responses***

*A third theme that emerges from this review is the lack of consistency in the public assessments of government agencies or between the assessments and actions of governments.* In the case of the United States, the most striking inconsistency is in the State Department's unclassified compliance reports. These have gone from charging North Korea with having a mature, offensive biological warfare program involving the development, production and possible weaponization of biological agents, to focusing for nine years largely on the continued development of North Korea's biological R&D infrastructure, and then back again to the same accusation from 20 years earlier of biological warfare agent development, production and possible weaponization.

The intelligence community's written threat assessment testimony on the North Korean BW threat has also shifted significantly over the years, from referring to the DPRK's legitimate biotechnology infrastructure in 2004, to charging the North with an active biological warfare program, including possible weapons in 2005, to not mentioning the issue at all from 2006 until 2018. Then, after reiterating previous statements concerning the biological warfare potential of North Korea's biotechnology infrastructure, nothing further was said on the subject in 2019, the last year threat assessment testimony was provided to Congress.

In the case of the South Korean government, there has been a lack of consistency both in its public reports and between those reports and its actions. Regarding the former, South Korea has gone from accusing North Korea of maintaining BW facilities and stocks to referring only to agents that North Korea is *able* or *suspected of being able* to develop and produce. This seeming shift in South Korea's assessment may help to explain the government's failure to procure anthrax or other vaccines to protect its military personnel and civilian population, despite earlier claims regarding North Korea's biological warfare capabilities.<sup>49</sup>

### ***Interagency Differences***

*A fourth theme that emerges from this review is that of conflicting assessments between government agencies.* As noted above, after some 12 years of not mentioning the North Korean biological weapons issue in its threat assessment testimony to Congress, in 2018, the DNI reiterated earlier statements regarding the ability of North Korea's biotechnology infrastructure to support a biological warfare program. The DNI then said nothing about North Korea in 2019, even as the State Department was again charging the North with developing, producing and possibly weaponizing biological warfare agents.

### ***Fragmentary Intelligence Information***

The 2019 State Department report also points to a final theme, and one that likely helps explain the previous four: *the fragmented insight the US government has into North Korea's biological warfare capabilities and intentions.* As is well known, BW development and production activities are among the most challenging intelligence collection targets, given that much of the equipment and materials can be used for both civilian and military purposes. And any available intelligence has been even more highly compartmented, i.e., controlled, within the US government, in the decade and a half since the Iraqi WMD intelligence debacle.



Moreover, the availability of modern equipment, such as the fermenters seen at a new biopesticide facility shown on North Korean television in June 2015,<sup>50</sup> or training in handling microorganisms, including using biotechnology,<sup>51</sup> does not translate directly into an ability to produce biological warfare agents successfully. As Sonia Ben Ouagrham-Gormley has pointed out, personnel must be able to adapt from industrial to military-related work. This requires not only scientific expertise but also a stable, continuously resourced work environment.<sup>52</sup> Given the closed nature of North Korean society, both internally and to the outside world, it is unlikely that the US or South Korean governments would know without highly credible sources on the ground whether the North has given BW this degree of priority.<sup>53</sup>

In the final analysis, North Korea may once have had an interest in acquiring BW and may indeed still be pursuing what in 2012 DOD called a potentially robust capability, possibly including the use of biotechnology to develop new types of BW agents. DOD's vaccination decisions, as well as its programs to enhance both its own and South Korea's ability to detect and identify a covert or other biological attack, can certainly be viewed as supporting that conclusion.

It is also possible that North Korea never moved beyond an early stage of BW activities, perhaps involving R&D on traditional agents like anthrax, together with the establishment of a biotechnical infrastructure that could be diverted to biological warfare agent production in the event of imminent hostilities.<sup>54</sup>

Finally, it is possible that, as in the case of Libya, the North Korean program never moved beyond initial planning, or like Iraq, the North's program, whatever its previous nature, has essentially ended. But one thing seems clear: Nothing in the official public record to date indicates that North Korea has an advanced BW program, notwithstanding media reports to the contrary.

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## Endnotes

- <sup>1</sup> “Candidate Vaccine for COVID-19 Developed in DPRK,” *Naenara via KCNAWatch*, July 18, 2020, <https://kcnawatch.org/newstream/1595059471-271430973/candidate-vaccine-for-covid-19-developed-in-dprk/?t=1604435405773>.
- <sup>2</sup> Elizabeth Ralph, “How Covid-19 Could Give Kim Jong Un a Doomsday Weapon,” *Politico*, July 28, 2020, <https://www.politico.com/news/magazine/2020/07/28/north-korea-coronavirus-vaccine-385096>.
- <sup>3</sup> *Ibid.*
- <sup>4</sup> For the other articles, see Emily Baumgaertner and William J. Broad, “North Korea’s Less-Known Military Threat: Biological Weapons,” *The New York Times*, January 15, 2019, <https://www.nytimes.com/2019/01/15/science/north-korea-biological-weapons.html>; and Joby Warrick, “Microbes by the ton: Officials see weapons threat as North Korea gains biotech expertise,” *The Washington Post*, December 10, 2017, [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](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). All three articles are similar in their depiction of the threat.
- <sup>5</sup> Following the first Gulf War in 1991, United Nations inspectors found that Iraq did indeed have an offensive biological warfare program, as intelligence assessments had claimed. But this was not the case after the second Gulf War, which began in 2003.
- <sup>6</sup> For further discussion of sourcing issues, see John Parachini, “Why We Should be Skeptical About Recent Reports on North Korea’s Biological Weapons Programs,” *38 North*, January 30, 2019, <https://www.38north.org/2019/01/jparachini013019/>; and Elisa D. Harris, “Threat Reduction and North Korea’s CBW Programs,” *The Nonproliferation Review* 11, no. 3 (Fall/Winter 2004).
- <sup>7</sup> *Hearings Before the Committee on Armed Services House of Representatives, Committee on Armed Services, Subcommittee on Seapower and Strategic and Critical Materials*, 100th Cong. 48 (1988) (statement of Rear-Admiral William O. Studeman, USN, Director of Naval Intelligence, before the US House of Representatives).
- <sup>8</sup> Department of Defense, *Proliferation: Threat and Response*, April 1996.
- <sup>9</sup> Department of Defense, *Proliferation: Threat and Response*, January 2001.
- <sup>10</sup> The 2013 report says that information regarding North Korea’s biological research came from the same sources, but the text does not make clear whether it was from open-source reports from defectors or just open source-reports. Office of the Secretary of Defense, *Military and Security Developments Involving the Democratic People’s Republic of Korea, 2013: Annual Report to Congress*, 21 (hereafter cited as OSD, *Military and Security Developments Involving The Democratic People’s Republic of Korea*, with date).
- <sup>11</sup> Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the Democratic People’s Republic of Korea*, 2015, 21, <https://fas.org/irp/world/dprk/dod-2015.pdf>. The claim that North Korea may consider the use of biological weapons an option was also repeated in a 2017 letter to Congress by the Vice Director of the Joint Chiefs of Staff. See: Dan Lamonthe and Carol Morello, “Securing North Korean nuclear sites would require a ground

- invasion, Pentagon says,” *The Washington Post*, November 4, 2017, [https://www.washingtonpost.com/world/national-security/securing-north-korean-nuclear-sites-would-require-a-ground-invasion-pentagon-says/2017/11/04/32d5f6fa-c0cf-11e7-97d9-bdab5a0ab381\\_story.html](https://www.washingtonpost.com/world/national-security/securing-north-korean-nuclear-sites-would-require-a-ground-invasion-pentagon-says/2017/11/04/32d5f6fa-c0cf-11e7-97d9-bdab5a0ab381_story.html).
- <sup>12</sup> OSD, *Military and Security Developments Involving the Democratic People’s Republic of Korea*, 2017, 21, <https://fas.org/irp/world/dprk/dod-2017.pdf>.
- <sup>13</sup> US Army Headquarters, “North Korea Tactics,” *Army Techniques Publication* 7-100.2, July 2020, 1-11, G-3. An appendix in the report added cholera, yellow fever, typhus and typhoid fever to the list of possible agents researched by North Korea, but these agents were not included in the main body of the report.
- <sup>14</sup> Milton Leitenberg, private communication, September 12, 2020.
- <sup>15</sup> Central Intelligence Agency, *Unclassified Report to Congress on the Acquisition of Technology Related to Weapons of Mass Destruction and Advanced Conventional Munitions*, 1997 (hereafter cited as CIA, *Unclassified Report to Congress on WMD Technology*, with date).
- <sup>16</sup> CIA, *Unclassified Report to Congress on WMD Technology*, January 1-June 30, 2000; CIA, *Unclassified Report to Congress on WMD Technology*, January 1–June 30, 2001.
- <sup>17</sup> CIA, *Unclassified Report to Congress on WMD Technology*, January 1-June 30, 2002.
- <sup>18</sup> CIA, *Unclassified Report to Congress on WMD Technology*, 2004.
- <sup>19</sup> See, for example: CIA, *Unclassified Report to Congress on WMD Technology*, 2008; and CIA, *Unclassified Report to Congress on WMD Technology*, 2011.
- <sup>20</sup> *The Worldwide Threat 2004: Challenges in a Changing Global Context*, US Senate, Select Committee on Intelligence, 108th Cong. (2004) (statement of George J. Tenet, Director of Central Intelligence).
- <sup>21</sup> *Global Intelligence Challenges, 2005: Meeting Long-Term Challenges with a Long-Term Strategy*, US Senate, Select Committee on Intelligence, 109th Cong. (February 16, 2005) (testimony of Porter J. Goss, Director of Central Intelligence).
- <sup>22</sup> *Statement for the Record, Worldwide Threat Assessment of the US Intelligence Community*, US Senate, Select Committee on Intelligence, 115th Long. (March 6, 2018) (statement of Daniel R. Coats, Director of National Intelligence).
- <sup>23</sup> The State Department is responsible for drafting the report and submitting it to Congress, though other agencies, including intelligence agencies, provide input and review the document as part of the interagency process.
- <sup>24</sup> Department of State, *Adherence to and Compliance with Arms Control and Nonproliferation Agreements and Commitments*, 2001, p. 11 (hereafter cited as DOS, *Compliance Report*, with date).
- <sup>25</sup> *Ibid.*
- <sup>26</sup> DOS, *Compliance Report*, 2005, 26-27.
- <sup>27</sup> DOS, *Compliance Report*, 2010, 20-21; and, DOS, *Compliance Report*, 2011, 10.
- <sup>28</sup> DOS, *Compliance Report*, 2016, 12.



- <sup>29</sup> DOS, *Compliance Report*, 2018, 16.
- <sup>30</sup> DOS, *Compliance Report*, 2019, 47-48; DOS, *Compliance Report*, 2020, 59.
- <sup>31</sup> DOS, *Compliance Report*, 2019, 48; DOS, *Compliance Report*, 2020, 59.
- <sup>32</sup> Ministry of National Defense, *Defense White Paper*, 1997 (hereafter cited as MND, *Defense White Paper*, with date).
- <sup>33</sup> MND, *Defense White Paper*, 1998.
- <sup>34</sup> MND, *Defense White Paper*, 2001.
- <sup>35</sup> Ministry of National Defense, *Handbook on Weapons of Mass Destruction*, December 10, 2001.
- <sup>36</sup> MND, *Defense White Paper*, 2006.
- <sup>37</sup> Hyun-Kyung Kim, Elizabeth Philipp and Hattie Chung, “The Known and the Unknown: North Korea’s Biological Weapons Program,” *Harvard Kennedy School Belfer Center for Science and International Affairs*, October 2017, <https://www.belfercenter.org/sites/default/files/2017-10/NK%20Bioweapons%20final.pdf>.
- <sup>38</sup> Thom Shanker, “The Reach of War: Biological Warfare; Pentagon to Expand its Anthrax Vaccinations,” *The New York Times*, July 1, 2004, <https://www.nytimes.com/2004/07/01/world/the-reach-of-war-biological-warfare-pentagon-to-expand-its-anthrax-vaccinations.html>.
- <sup>39</sup> Department of Defense, Deputy Secretary of Defense, *Memorandum Clarifying Guidance for Smallpox and Anthrax Vaccine Immunization Programs*, November 12, 2015.
- <sup>40</sup> Ralph, “How Covid-19 Could Give Kim Jong Un a Doomsday Weapon.”
- <sup>41</sup> Sangwoo Tak et al., “Enhancing ‘Whole of Government’ Response to Biological Events: Able Response 2014,” *Osong Public Health Research Perspectives* 9, no. 1 (2018).
- <sup>42</sup> Andrew Weber, private communication, October 19, 2020.
- <sup>43</sup> ECBC Communications, “JUPITR program takes shape on Korean Peninsula,” *Department of the Army*, March 13, 2014, <https://www.army.mil//article/121633>.
- <sup>44</sup> Joshua Pollack, private communication, October 6, 2020. Although press reports at the time described it as “live anthrax,” apparently no attempt was made to assess whether the anthrax was active before it was destroyed.
- <sup>45</sup> Jo He-Rim, “Presidential office admits importing anthrax vaccines, only for treatment,” *The Korea Herald*, December 25, 2017, <http://www.koreaherald.com/view.php?ud=20171225000166>.
- <sup>46</sup> United Nations, Monitoring, Verification and Inspection Commission, *Compendium of Iraq’s Proscribed Weapons Programmes in the Chemical, Biological and Missile Areas*, June 2006, 1143-45.
- <sup>47</sup> For an excellent discussion of the scientific, economic and other requirements a country must meet in order to develop and produce militarily effective biological weapons, see Sonia Ben Ouaghran-Gormley, “Potemkin or real? North Korean’s biological weapons program,” *Bulletin of the Atomic Scientists*, July 18, 2017, <https://thebulletin.org/2017/07/potemkin-or-real-north-koreas-biological-weapons-program/>.

- <sup>48</sup> Joshua Pollack, private communication, October 6, 2020. Missiles would seem to be a puzzling system for BW agent delivery by North Korea. Crop duster drones or stealth attacks by North Korean Special Operations Forces that infiltrate South Korea would appear to be more practical options.
- <sup>49</sup> W. Seth Carus, private communication, August 31, 2020. W. Seth Carus has pointed out that the South Korean military's slow response to the possible DPRK biological weapons threat may be more a reflection of cultural and bureaucratic imperatives.
- <sup>50</sup> Melissa Hanham, "Kim Jong Un Tours Pesticide Facility Capable of Producing Biological Weapons: A 38 North Special Report," *38 North*, July 9, 2015, <https://www.38north.org/2015/07/mhanham070915/>.
- <sup>51</sup> Joshua H. Pollack, "Dual-Use Capabilities at the Pyongyang Biotechnical Institute" (unpublished, June 19, 2015).
- <sup>52</sup> Ben Ouaghran-Gormley, "Potemkin or real? North Korean's biological weapons program."
- <sup>53</sup> The importance of insider information is mentioned in the December 2017 *Washington Post* story. See: Warrick, "Microbes by the ton: Officials see weapons threat as North Korea gains biotech expertise."
- <sup>54</sup> Milton Leitenberg, private communication, September 12, 2020. It should be noted, however, that over the last century, only one country, Iraq, has used dual-use facilities rather than dedicated military facilities for its biological weapons program.