INSTITUTE FOR DEFENSE ANALYSES

Archive Copy: Army Biological Defense Strategy

Julia K. Burr
Jeffrey H. Grotte
Sean M. Oxford
Douglas P. Schultz

June 2021
Approved for public release;
distribution is unlimited.
IDA Paper NS P-14378
Log: H 20-000379

INSTITUTE FOR DEFENSE ANALYSES
4850 Mark Center Drive
Alexandria, Virginia 22311-1882

The Institute for Defense Analyses is a non-profit corporation that operates three federally funded research and development centers to provide objective analyses of national security issues, particularly those requiring scientific and technical expertise, and conduct related research on other national challenges.

About This Publication

This work was conducted by the Institute for Defense Analyses (IDA) under contract HQ0034-14-D-0001, project CA-6-4609, "Medical CBRN Defense Planning and Response," for the Joint Staff, Joint Requirements Office (JRO) for Chemical, Biological, Radiological and Nuclear (CBRN) Defense (J-8/JRO) and the U.S. Army Office of The Surgeon General (OTSG). The views, opinions, and findings should not be construed as representing the official position of either the Department of Defense or the sponsoring organization.

Acknowledgments

The IDA team is grateful to Army senior leadership, the OTSG, the U.S. Army Nuclear and Combating Weapons of Mass Destruction Agency (USANCA), Army Futures Command (AFC), and the Army G-8 for the opportunity to develop this strategy, for guidance and coordination, and for their ongoing effort to implement the signed strategy. Particular thanks go to LTC Tommy Rezentes (OTSG) for promoting IDA's capabilities and sponsoring this work. The team is also grateful to the IDA reviewers, Dr. Ted Cieslak, Dr. Deena Disraelly, Dr. Ian Simon, and COL Mark Tillman (USA-ret.) for their thoughtful comments, Mr. John Everett for his careful editing, and Ms. Amberlee Mabe-Stanberry for producing this paper.

For More Information:
Dr. Sean M. Oxford, Project Leader
soxford@ida.org, 703-575-6348
ADM John C. Harvey, Jr., USN (Ret), Director, SFRD
jharvey@ida.org, 703-575-4530

INSTITUTE FOR DEFENSE ANALYSES

IDA Paper NS P-14378

Archive Copy: Army Biological Defense Strategy

Julia K. Burr
Jeffrey H. Grotte
Sean M. Oxford
Douglas P. Schultz

This page is intentionally blank.

Executive Summary

In the summer of 2020, having witnessed the impact of the coronavirus disease 2019 (COVID-19) pandemic, the U.S. Army recognized its need for a biological defense strategy that addresses the challenges to readiness and operations from biological warfare and naturally occurring disease outbreaks. Inspired by the more than 25-year relationship between the Army Office of the Surgeon General (OTSG) and the Institute for Defense Analyses (IDA), the Army asked IDA to develop the Army Biological Defense Strategy (ABDS) and adjudicate Army-wide review comments in coordination with Army stakeholders. The ABDS was signed by the Deputy Chief of Staff, G-3/5/7 in March 2021.

This paper is the record of the final version of the ABDS delivered by IDA to the Army. It is an unsigned and unofficial version of the ABDS. For a signed and official version, see the Army Publishing Directorate webpage https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN32553-SD_04_STRATEGY_NOTE_2021-01-000-WEB-1.pdf

The Army Biological Defense Strategy

Foreword

Biological threats and hazards can constrain mobility and freedom of maneuver, degrade readiness, and challenge the Army's ability to fight and win the nation's wars. As the COVID-19 pandemic demonstrated, biological risks to the Army's mission do not come solely from man-made threats, but can also include naturally occurring outbreaks of disease. The pandemic also led the Army to realize that while specialized medical and chemical, biological, radiological, and nuclear (CBRN) defense organizations within the Army play a critical role, successful biological defense requires unified effort across the whole Army. Since biological threats and hazards will be a pervasive feature of the strategic environment for the foreseeable future, the Army must maintain and increase its biological defense capabilities if it is to successfully prosecute multi-domain operations (MDO) and large-scale combat operations (LSCO). Implementation of the *Army Biological Defense Strategy* will enable the Army to address shortfalls in biological defense across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) to ensure mission accomplishment against the full range of potential biological threats and hazards.

The *Army Biological Defense Strategy* describes four Lines of Effort (LOEs) that, when executed, enable the Army to expand and share its scientific, medical, and operational biological defense knowledge; enhance its ability to routinely gain and maintain shared and comprehensive biological defense situational awareness; modernize its biological defense policy, concepts, capabilities, research, development, test, and evaluation (RDT&E), and force structure; and conduct the planning, preparation, and training required to protect the force and respond to biological threats and hazards while maintaining readiness and projecting force in competition or transition to armed conflict. Army Strong!

The Army Biological Defense Strategy

Table of Contents

The Army Biological Defense Strategy

I. Introduction

The *Army Biological Defense Strategy* articulates how the Army achieves the goals of biological defense within the framework of the *Army Strategy* and the *National Biodefense Strategy*.

A. Background

Since Walter Reed's pioneering research on yellow fever at the start of the 20th century, the Army has stood at the forefront of infectious disease research and response worldwide. As an expeditionary force, the Army encounters endemic diseases in all areas of the world and operates where the conditions that give rise to emerging disease—globalization, conflict, environmental change—are prevalent. Army forces face adversaries that are armed with biological warfare or are capable of exploiting naturally occurring outbreaks of disease for military gain. Biological threats and hazards—well beyond those seen in the homeland—have been an enduring feature of the strategic environment in which the Army operates and will remain so for the Army of the future.

Now, after decades of atrophy at the tactical to strategic levels, individual and collective biological defense capabilities must be improved to support the Army's renewed emphasis on multi-domain operations (MDO) and large-scale combat operations (LSCO). The COVID-19 pandemic has exposed shortfalls in Army biological defense planning, preparation, and material capabilities. It has become clear: **the Army's ability to deploy, fight, and win the nation's wars is at risk as long as the Army cannot sufficiently gain and maintain situational awareness, protect its people, mitigate impact, project force, and maneuver freely within a biological hazard or threat environment**.

To address this problem, biological defense must be broadly integrated and made routine throughout the Army. As with any military campaign, biological defense requires unity of command and unity of effort as well as the convergence of capabilities and combined arms integration at echelon. Yet historically, biological defense has been the domain of specialized medical and chemical, biological, radiological, and nuclear (CBRN) personnel, and the Army is now engaged in numerous, disparate efforts to overcome identified gaps in biological defense capabilities. An Army-level strategy is needed to establish unity of effort in biological defense and to ensure that these efforts are effective, sustainable, and integrated within a comprehensive solution to the Army's biological defense problem.

B. Purpose and Ends

The purpose of the *Army Biological Defense Strategy* is to maintain the Army's capability and capacity to accomplish its mission and to ensure readiness in the face of biological threats and hazards to support the Department of Defense (DOD) and the Nation.

The **Ends** of the Army Biological Defense Strategy are that

- The Army is **resilient** to biological threats and hazards and is able to **project force and maneuver freely** in a biological hazard and threat environment.
- The Army consistently, fully, and accurately **understands and recognizes** the biological hazard and threat situation and risks.
- The Army **protects** soldiers, Army civilians, and other members of the Army community from biological threats and hazards.

- The Army is rapidly able to **mitigate** the impacts of biological threats and hazards and **reconstitute** Army capabilities.

The *Army Biological Defense Strategy* applies across the range of military operations and integrates with the Army's strategic objectives. When implemented through the *Army Campaign Plan*, the *Army Biological Defense Strategy*

- Better enables the Army Vision, MDO, LSCO, and other Army functional and supporting concepts
- Supports the execution of higher guidance, including the *National Biodefense Strategy*, the emerging Joint Warfighting Concept, Joint Publication 3-11, and Joint Publication 4-02
- Informs Army and DOD Planning, Programming, Budgeting, and Execution (PPBE) processes, modernization priorities, and doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) processes for biological defense.

The *Army Biological Defense Strategy* ensures that the Army, long the DOD Executive Agent for the Chemical and Biological Defense Program (CBDP), will have the critical biological defense capability and capacity on which the other Services, the DOD, and the Nation will continue to rely. Therefore, the Army will be a major participant in the whole-of-government approach to national biological defense, as articulated in the *National Biodefense Strategy*. While this strategy outlines and describes how the Army will execute its mission in a biological hazard or threat environment, the Army must rely on the whole-of-government effort and, especially, a DOD-wide effort to ensure that all elements of the Joint Force are sufficiently capable of executing biological defense measures.

To inform biological defense capability development, operational planning, and decision making, the Army will need to maintain and expand its specialized, highly technical biological defense and medical capabilities, sustain and bolster state-of-the-art science and technology research facilities, and maintain established subject matter expertise while cultivating much-needed new expertise within the Force. Further, biological defense capabilities and expertise can no longer be confined to the chemical and medical communities but must now be integrated within a broad, leadership-driven, whole-of-Army approach to biological defense that establishes appropriate governance and resourcing, routinely engages all elements of the Army, supports Army concepts, and aligns with the *Army Strategy* in readiness, modernization, reform, and ally/partner engagement.

Effective biological defense depends on a combination of capabilities throughout the force and across the DOTMLPF-P spectrum, including the awareness of potential adversary capabilities, the ability to recognize biological threats and hazards as they arise, and the capability to provide physical protection and medical prophylaxis, health protection, and theater medical support. Agility in biological defense is key. Developing, maintaining, and using the right mixes of capabilities in the face of an uncertain spectrum of potential threats and capabilities is a dynamic and essential component of biological defense.

II. The Strategic Environment

The *Army Biological Defense Strategy* must complement the *Army Strategy* to enable the Army to achieve its objectives in the face of ubiquitous biological threats and hazards.[1] Accordingly, the Army biological defense strategic environment provides additional detail regarding the means by which biological weapons, naturally occurring endemic, zoonotic, emerging or reemerging disease outbreaks, or natural outbreaks exploited by adversaries or competitors could degrade the Army's readiness and ability to accomplish its mission.

The *Army Strategy* describes a dynamic and complex strategic environment[2] in which the Army of 2028 must prepare to face global competitors, regional adversaries, domestic threats against bases and military infrastructure, threats to the food supply and materiel, and many other dangers. Decision cycles and reaction times will be compressed, and uncertainty will abound. Within this strategic environment, biological threats and hazards will confront the Army in every operation and at all times. All areas where the Army operates include military units and infrastructure that are vulnerable to biological weapons and disease hazards.

Biological weapons have long been recognized as a threat to U.S. military forces, and, as recent experience has shown, naturally occurring contagious diseases can also create circumstances that impose severe limitations on the Army's ability to maintain the readiness, posture, and access required to compete with and deter near-peer adversaries. For example, disabling key logistic nodes and command and control (C2) centers or reducing combat power in units at critical phases of conflict could provide adversaries with operational advantages that cannot be obtained through kinetic action alone. Adversaries may also use information warfare tools to magnify the potential impacts of biological threats, imply U.S. and partner nation culpability, challenge attribution, and disrupt strategic messaging to strain alliances and restrict U.S. access.

In addition, the uncertainties associated with biological events could complicate planning, reduce the Army's ability to respond to a developing crisis, and hamper decision making during complex and chaotic operations.

A. Adversary Biological Warfare Programs

Although relatively few nations are believed to possess active biological warfare capabilities, this short list may include some of our most concerning adversaries: Russia, China, and North Korea. These nations have access to the advances in biological sciences and technology that may enable them to produce and weaponize traditional biological agents and potentially advanced biological agents intended to defeat our abilities to mitigate the use of these weapons. These nations' intents and specific capabilities with respect to the employment of such agents are largely a matter of conjecture, so any biological weapons use will likely be unexpected, occur without warning, and potentially mimic naturally occurring diseases to delay response or avoid attribution. Biological warfare programs have also included—and may still include—anti-material and anti-agricultural agents that could interfere with force deployment and consumables such as fuel. Biological agents can be noncontagious, with effects limited to individuals directly exposed or contagious, to enable secondary spread to other Army units, allied and partner forces, host nation civilians, or the U.S. civilian population.

---

[1] In the context of this strategy, biological threats and hazards are pathogens, toxins, and the diseases that they cause. While toxins behave in some ways like chemicals, many of the defenses against them are the same as those for pathogens.

[2] Annex 1 to this document provides the strategic environment described in the *Army Strategy*.

Terrorists, state proxies, violent extremists, and similar non-state actors have also signaled possible interest in biological agents. While their agents and delivery methods may be less sophisticated than those produced by well-funded state programs, their ability to cause disruption could be considerable. These adversaries' capabilities are expected to improve over time.

B. Contagious Endemic and Emerging Diseases

The *Army Biological Defense Strategy* expands the scope of biological defense beyond biological warfare threats to encompass outbreaks of endemic and emerging disease when those outbreaks exceed Army public health response capability and capacity and threaten Army readiness and mission. Contagious disease outbreaks are of primary concern. Many potential operating areas throughout the world are affected by outbreaks of endemic, contagious infectious diseases, such as Ebola, which could limit Army operations in multiple ways, such as through restrictions on logistics movement or tactical maneuver. Even outbreaks of more common contagious diseases, such as influenza, could reach levels of infection and morbidity that diminish the readiness of the force and cause disruption to necessary infrastructure, such as ports and transportation hubs needed for force flow.

Endemic and emerging disease outbreaks can be caused by non-contagious vector-, food-, and water-borne pathogens and toxins and may affect animals and agriculture as well as humans. Broadly speaking, such outbreaks will be smaller, more localized, and more readily controlled than contagious disease outbreaks among humans, with less impact on operations. Army capabilities to protect against and mitigate the impacts of contagious disease outbreaks and biological warfare outbreaks should effectively address these other disease threats and hazards.

Endemic diseases are known and can be planned for. Emerging diseases—ones not encountered before, as well as variants of known diseases—pose additional problems and are likely to impact readiness and operations. Depending on the rapidity and scale of the appearance of emerging diseases, the Army may be unprepared with regard to physical protection, operational measures to limit exposure, and medical countermeasures. Emerging diseases, by their nature, will be accompanied by significant uncertainty regarding their potential impact. Adversaries could exploit this uncertainty by using misinformation campaigns that cause the Army to take overly conservative actions that slow or disrupt readiness and operations. Adversaries are also likely to capitalize on the fear of contagion among host-nation populations, with specific emphasis on those partners and allies most critical to enabling U.S. posture and access.

Factors such as urbanization, regional conflict, climate change, anti-microbial resistance and anti-vaccination movements are likely to increase the risk to military operations resulting from contagious endemic, emerging or re-emerging disease. Further, continued globalization will increase the likelihood that any given local outbreak will spread rapidly around the world.

C. Theaters of Operation

The Army operates in austere and developed theaters, both of which may involve biological weapons threats and disease hazards. In austere theaters, the Army may not be able to rely on host nation support and will need to be reliant on itself and other participating Services to confront threats and hazards. In developed theaters, more can be expected from allies and partners, which requires planning and interoperability; however, others' capabilities also present additional targets for biological attacks and disease degradation and potentially facilitate disease spread. In any theater of operation, the degree of permissiveness will affect the Army's implementation of biological defense since some activities, such as the ability to treat casualties on-site, may be difficult in a non-permissive environment.

D. National Resources

Although the Army possesses many biological defense capabilities, numerous additional biological defense resources can contribute to the implementation of a successful Army biological defense strategy. National resources comprise DOD assets, such as Service laboratories, defense agencies, such as the Defense Threat Reduction Agency (DTRA), and other governmental agencies, such as the National Institutes of Health (NIH), the national laboratory infrastructure, and the academic and commercial sectors. Reciprocally, implementation of the *Army Biological Defense Strategy* will support relevant aspects of the *National Biodefense Strategy* and any DOD Biological Defense Strategy that may be forthcoming.

E. Defense Support to Civil Authorities (DSCA)

Biological attacks or disease outbreaks in the U.S. homeland are normally the responsibility of civil authorities. However, responses to extreme events can sometimes exceed civilian capabilities and place demands on Army resources. For example, Army National Guard disaster response operations will often include disease outbreak control activities as a component of disaster relief. In these extreme cases, the Army may be called upon to conduct civilian support operations with increasing frequency as the likelihood of contagious endemic or emerging disease outbreaks grows. Army provision of health service support for these missions will compete with contemporaneous Army combat mission requirements and can impact readiness.

F. Assumptions

- Biological warfare and disease hazards will continue to challenge Army operations for the foreseeable future, and our knowledge of them will continue to be uncertain.
  - Counter weapons of mass destruction (CWMD) efforts cannot deter or prevent all biological warfare, and routine public health measures cannot successfully control all disease outbreaks.
- Failure to address biological defense will increase adversary interest in biological warfare and the exploitation of disease outbreaks.
- Advances in biological sciences and technology will accelerate and will be accessible to our adversaries and competitors.
- The Army and the other Services, DOD, and the Nation will continue to mutually rely on one another for certain biological defense capabilities and capacities.
- Because globalization fosters the rapid spread of disease across the world, the Army will have additional incentives to incorporate partners and allies into response planning and preparation to facilitate access and sustain mobility during competition and crisis.

G. Implications

The *Army Strategy* defines a future strategic environment with challenges, adversaries, and compounding factors that collectively generate a biological strategic environment dominated by uncertainty and with ubiquitous biological threats and hazards. Made manifest, those threats and hazards will impact the Army's ability to accomplish its mission in numerous ways.

Large-scale, deliberate biological attacks have the potential to generate sudden mass casualties that effectively prohibit the Army from continuing operations. Outbreaks of contagious endemic or emerging

diseases—especially those with high morbidity and mortality—present a challenge that is qualitatively different from biological warfare, yet one that can be commensurate in impact. While such outbreaks are likely to be naturally occurring, they can be perpetuated by adversary actions in multiple domains or even deliberately expanded to specific locations or populations. Knowledge of an emerging disease may be so limited that by the time the Army can effectively control an outbreak, casualties may have reached the levels feared in traditional biological warfare.

At the same time, measures to protect the force and prevent casualties can, to varying degrees, have negative impact on the Army's conduct of operations, including continuity of operations, and on readiness in preparation for operations. At the individual soldier level, the use of protective equipment to avoid exposure can degrade performance, placing forces in an inherently defensive posture. This impact may be significant but transient. In rare instances, medical prophylaxis used to prevent the onset of disease can have harmful side effects. Physical control measures, such as isolation, quarantine, restriction of movement, social distancing, and personal hygiene, can also be used to limit the spread of contagious disease. The impact of these measures is a function of many factors, including the severity and transmissibility of the disease and the extent of the outbreak. The potential impact can range from limited degradation of individual performance and unit operations, such as those from procedures to enforce social distancing, to pervasive, persistent, and severe restrictions on the mobility of and interactions between personnel and units. Such circumstances can compromise the Army's ability to project force and maneuver freely or can force postponement of new accessions and of individual and unit training and exercises. Readiness may be degraded.

III. Strategic Approach

The Army, in pursuit of the Ends of its Biological Defense Strategy, must prevent or minimize casualties from biological threats and hazards while minimizing the impact of casualty prevention measures on readiness and operations. Striking this balance will be a constant challenge, one that is significantly compounded by uncertainty in the strategic environment, particularly for outbreaks of emerging contagious disease about which little is known.

For these diseases, the recognition of outbreaks and implementation of responses to them may be delayed, and, if so, restrictions on mobility may be more severe and more widespread than otherwise warranted. Moreover, the success of physical control measures may be hampered by insufficient knowledge of pathogen behavior and disease characteristics, such as the incubation period for disease onset, thus prolonging the outbreak and exacerbating the impact on readiness and operations.

Uncertainty also inhibits detection and warning of biological warfare attacks through environmental detection and health surveillance. A lack of detection and warning, in turn, compromises efforts to limit casualties by delaying the use of individual and collective protection in an effort to limit exposure and by reducing the window of time for effective administration of medical prophylaxis after exposure.

The operational impact of measures to protect the force from biological threats and hazards and to prevent casualties is determined to a great extent by the availability of medical prophylaxis—vaccines and antibiotic/antiviral drugs that can prevent disease onset. Medical prophylaxis can prevent or limit casualties, thereby obviating the need for large-scale restrictions of movement and the associated degradation of readiness and operations. Yet, the Army cannot rely on medical prophylaxis for the full range of biological threats and hazards for a number of reasons:

- Vaccines and other drugs are expensive and time-consuming to develop, tend to target specific pathogens, and may be negated by bio-engineering or natural evolution.

- The biological threats and hazards that the Army encounters as an expeditionary force abroad often do not pose a risk to the civilian population at home in the continental United States. For threats of this type, pharmaceutical companies may not have economic incentives to develop vaccines.
- Emerging infectious diseases are, by definition, new and novel enough that protective vaccines will not exist for them, and the effectiveness of antibiotics and antiviral drugs as prophylaxis or therapy will not have been established or approved.

Limits on the availability of medical prophylaxis may never be fully overcome. Still, given the crucial role of prophylaxis in biological defense, the Army can and must continue to pursue the development of widely applicable medical countermeasure base platforms and broad-spectrum, pathogen-agnostic medical countermeasures. These investments will enable responsive, cost-effective fielding of medical protection while hedging against uncertain biological threats and hazards.

The Army must also promote the prompt detection of biological warfare attacks and recognition of outbreaks of contagious infectious disease. These efforts must be supported by the rapid development, acquisition, and dissemination of high-confidence diagnostic testing capability for use in the field. They must also be supported by enhancements to biological readiness and situational awareness, including the proliferation of biological defense knowledge throughout the force; ready access to subject matter expertise to support information collection, analysis, and command decision making at all levels; clinical and epidemiological investigation capabilities; and flexibility in response capabilities and decision making.

The *Army Biological Defense Strategy* establishes four lines of effort (LOEs): Knowledge, Biological Defense Situational Awareness, Readiness, and Modernization. Within each LOE, individual tasks may support other LOEs and may involve multiple Army commands. Collectively, implementing and executing these LOEs and their subordinate tasks will

- Enable timely, knowledge-based, and effective operational decisions to defend against biological threats and hazards at the tactical to strategic levels
- Develop and integrate biological defense across the DOPTMLPF-P domains
- Expand the availability of medical prophylaxis, to the extent financially and technically feasible, through innovation and application of advances in biological sciences
- Develop widely applicable diagnostic base platforms to enable rapid fielding of laboratory diagnostics to an operational environment and to allow the earliest possible detection of clinical disease cases as a trigger for medical countermeasures and/or physical control measures
- Rapidly characterize and communicate the behavior of emerging pathogens in the environment and in humans and characterize the clinical course of associated diseases to promote rapid environmental and clinical detection and to allow selection and implementation of the most effective and efficient physical control measures
- Explore new or expanded concepts for environmental detection and integrated early warning, together with enhanced physical protection, to maximize opportunities for avoiding exposures in BW attacks and triggering early use of prophylaxis and other force-health protection measures.

In pursuing the LOEs, the Army will align its efforts with those of the other Services, DOD, and national research and response capabilities to most efficiently and effectively apply available resources and to exploit the synergies that result from collaboration.

A. LOE 1: Knowledge

Knowledge enables the Army to operationalize science and medicine to prevent biological casualties while minimizing the impact of its casualty prevention measures on readiness and operations. Without a strong basis in scientific knowledge and understanding, biological defense situational awareness and readiness are not possible, and the modernization needed to defend against new but uncertain biological threats and hazards cannot be attained. Yet, knowledge of biological defense has waned within the Army since the United States terminated its offensive biological warfare program in 1969, and preparation and response to biological warfare and for outbreaks of contagious disease are now limited to portions of the medical community and the CBRN community.

The Knowledge LOE will reaffirm the Army's best-in-the-world biological defense research, development, test, and evaluation (RDT&E) capabilities, allowing it to compel and exploit advancements in biological science and medicine. The Army will be a leader within DOD and within the Nation for the study of emerging diseases, for research in platform-based, broad-spectrum, and/or pathogen-agnostic medical countermeasures, and for the development of agile diagnostic platforms that can be used in an operational environment.

1. Development and Management of Talent

- The Army must apply the *Army People Strategy* to manage human capital so as to best maintain and employ the scientific and medical expertise needed to support the RDT&E capabilities on which the *Army Biological Defense Strategy* depends.
- Biological defense knowledge must be embedded in professional military education at all levels to promote awareness of the potential operational impacts from biological threats and hazards and to enable knowledge-based decision making at echelon.
- The Army must establish collaborative partnerships and mechanisms for science and technology engagement across the government in support of the *National Biodefense Strategy* with DOD, Service, academic, or other research institutes, with corporate partners, with allies, and with non-governmental organizations.

2. Investment in Facilities

- The Army's investment in human capital must be complemented by modern facilities with state-of-the-art infrastructure and equipment, including laboratories, test facilities, and ranges.
- The Army must ensure that its biological defense knowledge base is sustained through baseline funding of human capital, facilities, and equipment.

B. LOE 2: Biological Defense Situational Awareness

Biological defense situational awareness is broad, enduring, and interactive with the other LOEs and other Army missions/functions. It must be integrated and routine across the force, must be operationalized and included in the Common Operating Picture (COP) at all levels of command, and must deliver timely and actionable information derived from diverse sources, capabilities, and actions,

including all-source intelligence. The importance of situational awareness cannot be overemphasized. Without comprehensive, timely information, the impact of biological threats and hazards cannot be effectively avoided, limited, or mitigated.

1. Biological COP at All Echelons

- Incorporate essential elements of biological-related data and information, including weather, intelligence, biological surveillance, environment detection, disease casualty reports, medical treatment facility status, and unit locations
- Establish, maintain, and regularly propagate a robust health risk assessment and associated force health protection guidance
- Maintain an up-to-date picture of ongoing biological defense actions, such as testing, logistics stocks, and biological defense unit capabilities and locations
- Maintain awareness of host nation and local civilian authority biological response capabilities
- Ensure that health, animal, agricultural, and environmental surveillance and diagnostic capabilities are informed by health risk assessment and support the COP
- Understand the capabilities and limitations of fielded information systems for collecting, reporting, managing, and disseminating all data needed to inform the COP
- Record and permanently retain all meteorological reports/information, terrain data, and unit locations to the company level within every area of responsibility to allow prompt and retrospective assessment of unit and individual exposures to biological threats and hazards
- Ensure sharing and coordination of information that supports biological defense situational awareness with sister Services, allies, partner nations, civil authorities, and other relevant parties.

2. Policy, Regulation, and Law

- Maintain awareness of biological defense forensic capabilities
- Understand U.S. allied and partner legal or regulatory constraints on responses to biological threats and hazards
- Know Army responsibilities to other U.S., other National, and other non-government agencies and vice versa.

3. Misinformation and Exploitation of Biological Threats and Hazards

- Identify and analyze how the adversary may exploit biological threats and hazards in novel ways and recommend countermeasures
- Maintain awareness of adversary cyber/social exploitation efforts and other misinformation related to biological defense and recommend countermeasures.

C. LOE 3: Readiness

The Army identifies the rebuilding of warfighting readiness as its top priority, with a focus on unit readiness and force projection. Yet, biological threats and hazards have significant potential to reverse

the Army's progress toward readiness goals and to degrade current levels of readiness temporarily and over the long term. The COVID-19 pandemic has disrupted accessions, the training base, and individual, unit, and collective training and exercises. Force projection is particularly subject to interruption by biological hazards if restrictions on individual and unit mobility are needed to protect the force and limit casualties. The Readiness LOE will enable the Army to protect the force and respond to biological threats and hazards while ensuring that the Army can remain focused on maintaining readiness and conducting its mission.

1. Protection

- Define biological defense readiness and establish metrics for readiness assessment at echelon
- Report biological defense readiness at the tactical, operational, and strategic levels
- Ensure that available medical countermeasures can be used to their maximum possible benefit
- Strengthen the general health of individual soldiers as a component of enhancing immunity to disease
- Promote systematic use of standard personal hygiene measures, augmented by measures to protect against specific biological threats and hazards as warranted
- Secure the supply chain for the production of biological defense/medical materiel and develop contingency plans in the event of supply chain disruption
- Protect and ensure the civilian strategic deployment capability in the face of biological threats and hazards
- Protect installations against biological attack and disease
- Protect and meet the needs of Army families during epidemics, pandemics, and biological attacks
- Provide psychosocial support to disease survivors and family members to foster resilience, prevent pathological sequelae, and enhance recovery from the stress of illness.

2. Response

- Ensure that fielded detection, physical protection, decontamination assets, diagnostics, prophylaxis, and treatments are accessible and can be employed by the force when needed
- Establish and maintain mass casualty disease response, including a response for contagious diseases
- Ensure that commanders and staff at all levels have access to the biological subject matter expertise needed to support situational awareness and response decision making
- Posture the Army to execute its responsibilities to other agencies and ensure that reciprocal agreements can be/are executed
- Maintain the capability to rapidly execute biological defense forensics
- Maintain the stockpiled materials required to implement Army biological defense measures globally.

3. Training

- Conduct individual and collective training for biological-defense-specific tasks
- Integrate biological threats and hazards into individual and collective training scenarios
- Exercise and train operational decision making against realistic scenarios for biological warfare attacks and outbreaks of contagious disease and include integration of RDT&E capabilities and subject matter expertise needed to enable rapid execution of responses, such as the deployment of new medical countermeasures
- Exercise and train in biological threat and hazard scenarios under conditions of biological response, such as physical protection and restrictions of movement
- Integrate biological threats and hazards into strategic and operational exercises to assess response capabilities, including strategic communications, across a range of competition and crisis scenarios.

4. Communication, Collaboration, Sharing

- Provide strategic communications and communicate with the Joint Force, national civilian authorities, the American public, and allies during biological attacks and disease outbreaks to ensure timely, consistent, correct information, to counter disinformation, and to negate adversary false narratives or exploitation efforts
- As the *National Biodefense Strategy* is implemented, ensure that the Army implements complementary measures that align with this strategy
- Collaborate with allies and partners to strengthen their biological defensive capabilities and to establish interoperability in biological defense concepts and procedures.

D. LOE 4: Modernization

Modernization addresses several topics, from the development of concepts and doctrine to material acquisition. Although the Army does require material biological defense modernization, the key to overall success across the range of military operations is incorporating lessons learned and implementing supporting policy, concepts, and doctrine.

1. Concept and Doctrine

The Army must expand the functional concepts to address biological threats and hazards by incorporating or developing a supporting concept for biological defense that enables simultaneous execution of MDO/LSCO, Army Title 10 functions, and DSCA. The supporting concept should be validated through field-testing or other means and then incorporated into doctrine. For example, in support of MDO/LSCO, the concept should address the following:

- Identification of essential elements of information, information provision time requirements, information sources, and reporting chains to support biological situational awareness as described in LOE 2 and associated doctrine and tactics, techniques, and procedures
- Inclusion of lessons learned and best practices from the Army, other Services, Combatant Commands (CCMDs), allies, partners, and national, state, and local agencies from COVID-19 pandemic response

- Force projection and support for continued operations that must occur in a biological threat or hazard environment, including extension of unit self-sufficiency
- Rapid large-scale medical treatment and evacuation of biological casualties, including mass casualty medical care and associated resource demands, impact of contagious and non-contagious casualties, and alternative return to duty and theater evacuation policy based on the duration and severity of disease(s)
- Personnel and unit replacement in large-scale biological casualty situations
- Initiating, sustaining, and relaxing isolation, quarantine, and restriction of movement
- Management of biological fatalities
- Integration of RDT&E capabilities and subject matter expertise into operational decision-making and response.

In addition, the concept must also address

- Protection and continued operation of the institutional Army, the Army Reserve and National Guard
- Protection and continued operation of the RDT&E establishment and Army logistical functions
- Protection of installations from biological threats and hazards
- Protection and support for Army families in a biological threat and hazard environment
- Inclusion of biological defense in the Army readiness reporting system at the tactical, operational, and strategic levels.

2. Capability Development

- Develop an agile RDT&E capability to provide diagnostic, prophylactic, and therapeutic responses to altered, evolved, and novel biological threats and hazards—a capability that must be accompanied by the industrial, logistical, and operational ability to apply solutions across the force
- Continue to develop and field detection capabilities, medical diagnostics, and medical countermeasures for known biological threats and hazards
- Develop and field deployable laboratory capabilities to support the diagnostic mission
- Develop and field rapid, large-scale medical treatment and evacuation capabilities, including protocols for treating disease casualties in mass casualty situations
- Continue to develop and field collective protection and less degrading individual protection
- Develop capabilities for protection and care of Army families
- Institutionalize a biological casualty estimation process that addresses natural and man-made outbreaks of contagious disease and develop the personnel and analytical tools needed to forecast spread of contagious and vector-borne disease
- Assess and, as required, provide self-mobility in the echelon above brigade medical force structure

- Develop, standardize, and implement a communications architecture that enables normal task performance, coordination, and C2 under isolation, quarantine, and restriction of movement situations.

3. Force Development

- Retain ownership and C2 of Army medical RDT&E capabilities
- Include an assessment of risk from biological threats and hazards in MDO/LSCO when sizing medical force structure
- Address the problems of Reserve and National Guard mobilization that might adversely affect the civilian medical system and the dedication of active force medical assets to civil response that could adversely affect the military health care system
- Establish the requisite manning (skill, rank, and distribution) of biological defense expertise and other required skills, such as disease modelling
- Assess the sufficiency of current biological defense formations and develop new formations as required
- Synchronize biological defense with CWMD and counter-proliferation.

4. Policy

- Enable a nationwide credentialing and privileging of U.S. Army medical personnel in all states and territories
- Review current policy and regulations for potential U.S. Army use of allied nations' medications that have not been approved by the U.S. Food and Drug Administration (FDA) and determine emergency use rules
- Review current local, state, national, and international agreements, policies, and so forth to identify and eliminate existing and potential limitations on U.S. Army biological defense execution. For example, enhance and streamline the Army's capability to acquire and administer medication before full FDA approval
- Pursue policy initiatives to ensure that Army biological defense capabilities remain effective and responsive under all conditions of biological defense governance within DOD and USG.

IV. Governance

The *Army Biological Defense Strategy* enables a paradigm shift in biological defense—from highly technical, low-density, niche capabilities within the Chemical and Medical branches to a broadly integrated, routinized, whole-of-Army effort in support of the Joint Force and the Nation. However, current laws, regulations, and organizational roles and responsibilities[3] throughout the DOD inhibit the unity of command and unity of effort that the Army needs to transition biological defense to a command-driven, operationally integrated capability.

[3] The National Defense Authorization Act for Fiscal Year 1994 (Public Law 103-160, Section 1701), February 26, 1994, implemented by Title 50 United States Code § 1522, consolidates all funding for chemical/biological RDT&E. Initial procurement is in the CBDP budget, while the individual Services fund follow-on procurement and non-CBDP items. This consolidation was intended to reduce duplication among the Services.

The Army requires a governance structure that enables the synchronized implementation of the *Army Biological* Defense *Strategy* across the Army, and the consolidation of biological defense capabilities under Army C2—from RDT&E activities through fielded units. This new Army biological defense governance structure must align with the CBDP Executive Agency governance structure to promote coordination and efficiency in activities and investment.

V. Implementation

To implement the *Army Biological Defense Strategy*, the Army must establish an Office of Primary Responsibility (OPR) that is authorized to coordinate efforts to identify and mitigate DOTMLPF-P biological warfare defense and infectious disease gaps across all Army stakeholders (Army Staff (ARSTAF), Army Commands (ACOMs), and the Army Service Component Commands (ASCCs)). Close stakeholder coordination will ensure a comprehensive, integrated implementation of the *Army Biological Defense Strategy*.

Implementation must be synchronized and coordinated with DOD processes and initiatives to support the Office of the Secretary of Defense (OSD) in carrying out its responsibilities for the chemical biological defense enterprise. The OPR must maintain awareness of biological defense threat and gap concerns of CCMDs, ACOMs, and ASCCs and must understand the biological defense activities being conducted by the CBDP, the Joint Requirements Office (JRO), the Services, the laboratories, and other relevant interagency entities.

The near-term priority is to establish an Army Biological Defense OPR with the appropriate skills and authorities to draft the implementation plan and set the conditions for long-term governance of the Army's biological defense efforts.

VI. Risks to Strategy

The *Army Biological Defense Strategy* bears within it implicit risks. If the actions outlined in the LOEs are not carried out effectively, the Army's ability to compete and deter in the face of biological threats will be diminished. However, the Army can mitigate these risks through adherence to an implementation plan. Greater risks are inherent in those actions that require cooperation by outside organizations and agencies, which the Army can attempt to influence but may not be able to fully control. Of these, the following risks are of greatest concern:

- Failure to establish governance within DOD that oversees execution of the activities outlined in the *Army Biological Defense Strategy*
- Failure to obtain adequate and consistent funding to implement the *Army Biological Defense Strategy*
- Failure to develop and maintain agreements with the broader scientific community and the U.S. industrial and supplier base to ensure the rapid, "surgeable" response that is uniquely required to augment Army capabilities to counter the biological threats and hazards that motivate this strategy
- Failure to establish a DOD-wide effort to ensure that all elements of the Joint Force are sufficiently aligned and capable of defending against biological threats and hazards
- Failure to preserve the medical force structure and readiness needed for the execution of the *Army Biological Defense Strategy*.

VII. Conclusion

The *Army Biological Defense Strategy* describes a strategic environment that has ubiquitous and ever-changing biological threats and hazards whose characteristics and effects must be understood at all levels of command to protect the Army's ability to compete with and deter near-peer adversaries. The strategy identifies the critical needs for the Army to retain its biological defense RDT&E capabilities and capacities and to expand its capabilities and capacities to operate without restriction during outbreaks of contagious disease.

To meet these needs, the *Army Biological Defense Strategy* describes four LOEs that, when executed, will enable the Army to expand and share its scientific, medical, and operational biological defense knowledge; enhance its ability to routinely gain and maintain shared and comprehensive biological defense situational awareness; modernize its biological defense policy, concepts, doctrine, capabilities, RDT&E, and force structure; and conduct the planning, preparation, and training required to protect the force and respond to biological threats and hazards while maintaining readiness and projecting force in competition or transition to armed conflict.

Progressing along the LOEs and achieving the desired Ends of this strategy require an appropriate governance structure, consistent and adequate funding, and an implementation plan that facilitates a whole-of-Army, leadership-driven, and sustained effort that makes biological defense a routine part of Army processes. A fully executed *Army Biological Defense Strategy* will enable the Army to maintain readiness and accomplish its mission against the full range of potential biological threats and hazards.

CHARLES A. FLYNN
Lieutenant General, GS
Deputy Chief of Staff, G-3/5/7

Annex 1.
The 2018 Army Strategy Strategic Environment[4]

The Strategic Environment – Today, political, economic, social, and technological changes are creating challenges and opportunities for maintaining the Army's land power dominance. Battlefields are expanding across all domains, geographic scale, and types of actors, while at the same time, decision cycles and reaction times continue to be compressed. Furthermore, our Army will operate on congested, and potentially contaminated, battlefields while under persistent surveillance, and we will encounter advanced capabilities such as cyber, counter-space, electronic warfare, robotics, and artificial intelligence. These dynamics are changing the character of warfare for which the Army of 2028 must be prepared to face global competitors, regional adversaries, and other threats.

A. Great Power Competitors – Great power competitors, China and Russia, have implemented modernization programs to offset our conventional superiority, and the challenges they present are increasingly trans-regional, multi-domain, and multi-functional. Advanced nations are developing sophisticated anti-access and area denial systems, air and missile defense, cyber, electronic warfare, and counter-space capabilities to disrupt military deployments into operational theaters. Although we may not face near-peer competitors directly, they are using actions short of armed conflict to challenge us. We are also likely to face their systems and methods of warfare as they proliferate military capabilities to others.

B. Regional State Adversaries – Regional state adversaries, namely North Korea and Iran, present significant challenges as they seek nuclear, area denial systems, and conventional weapons to gain regional influence and ensure regime survival. Their asymmetric warfare capabilities, weapons of mass destruction, provocations, and potential for collapse pose a threat to not only regional allies, but also increasingly to the United States and the rest of the world. Additionally, regional state adversaries are using state-sponsored terrorist activities and proxy networks to achieve their objectives

C. Other Threats – Terrorists, trans-national criminal organizations, cyber hackers, and other malicious non-state actors have transformed global affairs with increased capabilities of mass disruption. The Army will likely conduct irregular warfare for many years to come, not only against these non-state adversaries, but also in response to state adversaries who increasingly rely on asymmetric approaches. Terrorism remains a persistent condition driven by ideology and unstable political and economic structures, which could result in failed states, civil wars, and uncontrolled migration forcing our allies and partners to make difficult choices between defense spending and domestic security.

D. Economic Uncertainty – The Army made necessary but difficult choices to defer modernization over several years of defense budget uncertainty while engaged in Iraq

[4] Extracted from United States Army, *The Army Strategy* (Washington, DC: Headquarters, Department of the Army, 2018), 2–3.

and Afghanistan. Global competitors are now challenging our conventional superiority as they implement comprehensive modernization programs. While current budgets provide the Army with the resources we need, fiscal uncertainty and decreased buying power will likely be a future reality, threatening our ability to achieve the Army Vision. The Army must pursue reforms and prioritize investments now to minimize the impact of fiscal constraints in the future.

E. **Dynamic International Operating Environment** – Amidst all of these challenges, the international operating environment is becoming increasingly dynamic and complex. As the backbone of the international world order following World War II, the United States helped develop international institutions to provide stability and security, which enabled states to recover and grow their economies. Global competitors are now building alternative economic and security institutions to expand their spheres of influence, making international institutions an area of competition. As a result, we must strengthen our alliances and partnerships, and seek new partners to maintain our competitive advantage.

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

1. REPORT DATE (DD-MM-YY)	2. REPORT TYPE	3. DATES COVERED (From – To)
XX-06-2021	Final	

4. TITLE AND SUBTITLE

Archive Copy: Army Biological Defense Strategy

5a. CONTRACT NO.

HQ0034-14-D-0001

5b. GRANT NO.

5c. PROGRAM ELEMENT NO(S).

6. AUTHOR(S)

Julia K. Burr
Jeffrey H. Grotte
Sean M. Oxford
Douglas P. Schultz

5d. PROJECT NO.

5e. TASK NO.

CA-6-4609

5f. WORK UNIT NO.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Institute for Defense Analyses
4850 Mark Center Drive
Alexandria, VA 22311-1882

8. PERFORMING ORGANIZATION REPORT NO.

IDA Paper NS P-14378
IDA Log H 20-000379

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Army Office of The Surgeon General DHHQ
7700 Arlington Blvd.
Falls Church, VA 22042-5143

10. SPONSOR'S / MONITOR'S ACRONYM(S)

OTSG

11. SPONSOR'S / MONITOR'S REPORT NO(S).

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

In the summer of 2020, having witnessed the impact of the coronavirus disease 2019 (COVID-19) pandemic, the Army recognized its need for a biological defense strategy that addressed the challenges to readiness and operations from biological warfare and naturally occurring disease outbreaks. Inspired by the more than 25-year relationship between the Army Office of the Surgeon General (OTSG) and the Institute for Defense Analyses (IDA), the Army asked IDA to develop the Army Biological Defense Strategy (ABDS) and adjudicate Army-wide review comments in coordination with Army stakeholders. The ABDS was signed by the Deputy Chief of Staff, G-3/5/7 in March 2021. This paper is the record of the final version of the ABDS delivered by IDA to the Army. It is an unsigned and unofficial version of the ABDS.

15. SUBJECT TERMS

biological defense; biological warfare; infectious disease; COVID-19; CBRN; Army; strategy; multi-domain operations; large-scale combat operations

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NO. OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			MAJ Mark T. Williams
U	U	U	U	26	19b. TELEPHONE NUMBER (Include Area Code) Mark.t.williams20.mil@mail.mil

This page is intentionally blank.