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Toward Integrated DoD Biosurveillance

Assessment and Opportunities

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Summary

The purpose of this study is to examine the missions and performance of the Department of Defense (DoD) biosurveillance enterprise. Specifically, the Office of Management and Budget (OMB) asked DoD to undertake a comprehensive review of its biosurveillance activities to accomplish the following tasks:

- Task 1: Identify a prioritized list of the program’s missions and desired outcomes, and develop performance measures and targets to track progress toward achieving those outcomes.
- Task 2: Evaluate how the current array of DoD biosurveillance program assets contributes to achieving these prioritized missions.
- Task 3: Assess whether the current funding system is appropriate and how it can be improved to assure stable funding.

Public health surveillance is a cornerstone of public health—an “essential function of a public health system” (Nsubuga, 2006)—just as national security surveillance and analysis are a cornerstone of national security. Health security is at the nexus where public health and national security meet. Public health surveillance typically reflects all hazards occurring in human populations, whether naturally occurring, accidental, or intentional.

Biosurveillance is more expansive in scope than public health surveillance because it applies to “all-hazards threats ... affecting human, animal or plant health.” Different agencies and earlier national policy documents use different definitions of biosurveillance. The one used in this study is from the National Strategy for Biosurveillance, dated July 2012. This definition of biosurveillance places an emphasis on the use of information for early detection and warning of events that are the “result of a bioterror attack or other weapons of mass destruction threat, an emerging infectious disease, pandemic, environmental disaster, or a food-borne illness.” Moreover, the Strategy also highlights a need to protect “domestic interests, and because health threats transcend national borders, the United States also plays a vital role within an international network of biosurveillance centers across the globe.”

The interim guidance for implementation of the National Strategy for Biosurveillance, issued by the Deputy Secretary of Defense on June 13, 2013, was the first DoD policy guidance referring explicitly to “biosurveillance.” It indicates that DoD adopts the Strategy’s definition of the term, calls for development of a DoD Directive (DoDD) on biosurveillance within 12 months, and specifies early tasks and a governance mechanism, pending the Directive. In the present report, DoD’s “biosurveillance enterprise” refers to the programs, policies, and funding related to biosurveillance activities—drawing from the definition of the term and the functions and guiding principles of the National Strategy for Biosurveillance—and the DoD organizations responsible for such activities.

DoD has been conducting biosurveillance activities for several years through entities under three main stakeholders within the Office of the Secretary of Defense (OSD)—the Under Secretaries of Defense for Protection and Readiness; Acquisition, Technology and Logistics; and Intelligence—and the Services. The enterprise encompasses a wide range of relevant activities, from traditional health surveillance to medical intelligence, host nation biosurveillance capacity building, and defense against biological weapons.

The focus of the DoD biosurveillance enterprise is on human health (and less on animal or plant disease), which is aligned with the core defense missions of providing the forces needed to deter war and protect the homeland (DoD, 2012b). Therefore, it is not surprising that a central and traditional element of the biosurveillance enterprise is the set of human health surveillance activities related to Service members and affiliated populations, as well as occupational and environmental health surveillance, carried out by the Services, the Armed Forces Health Surveillance Center (AFHSC), and DoD laboratories in the continental United States (CONUS) and outside the continental United States (OCONUS).

DoD's Intelligence Community provides additional value to the biosurveillance enterprise. It uses intelligence tradecraft to provide "early warning" to identify and forecast emerging and potentially destabilizing threats. Medical intelligence activities are carried out under the Defense Intelligence Agency's (DIA's) National Center for Medical Intelligence (NCMI).

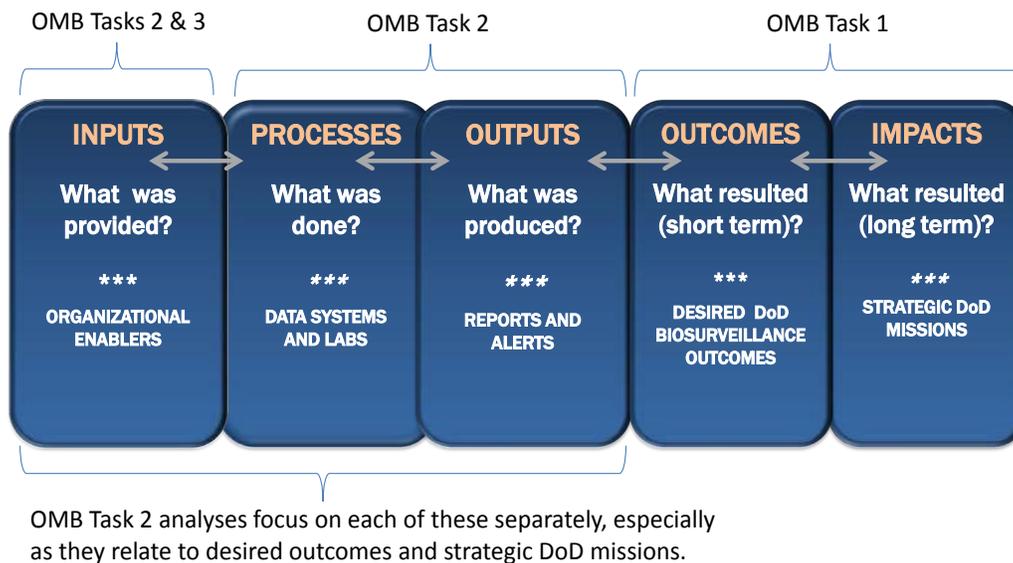
Work under the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD [NCB]), aimed at countering biological weapons, focuses on helping countries build their physical and professional biosurveillance capacity and capabilities. This includes technological acquisitions and cooperative biological research, which contribute to both global health security and a strategic engagement strategy. Program activities generally involve assisting prioritized countries with building laboratories, training epidemiologists, and using surveillance strategies and tools appropriately for effective health surveillance.

The DoD biosurveillance enterprise undertakes a variety of biosurveillance activities in the United States and internationally, for a range of customers and purposes. It monitors health in military populations and military families in CONUS and deployed populations, including civilians and contractors. It also supports collaborative surveillance with foreign governments in countries and regions of interest, for those countries' own situational awareness and reporting. As noted earlier, the entire enterprise looks for hazards that are natural and/or manmade to both protect the forces and detect potential biological weapons threats, as well as to enhance global health security more broadly. DoD, the U.S. government, and international policy makers and responders are the consumers of information produced by the DoD biosurveillance enterprise.

In order to respond to the tasks from OMB, the study team examined DoD's biosurveillance systems and assets, the enabling functions that support them (policy and doctrine, governance, organizational structures, personnel and training, materiel, logistics, and facilities), and the funding systems currently associated with the biosurveillance enterprise. They organized these using a logic model that flows from inputs (enabling functions and funding) to processes

(biosurveillance systems and assets), outputs (reports and alerts), outcomes (desired outcomes from biosurveillance), and impacts (strategic missions served). The logic model elements track well with the three OMB tasks, as shown in Figure S.1.

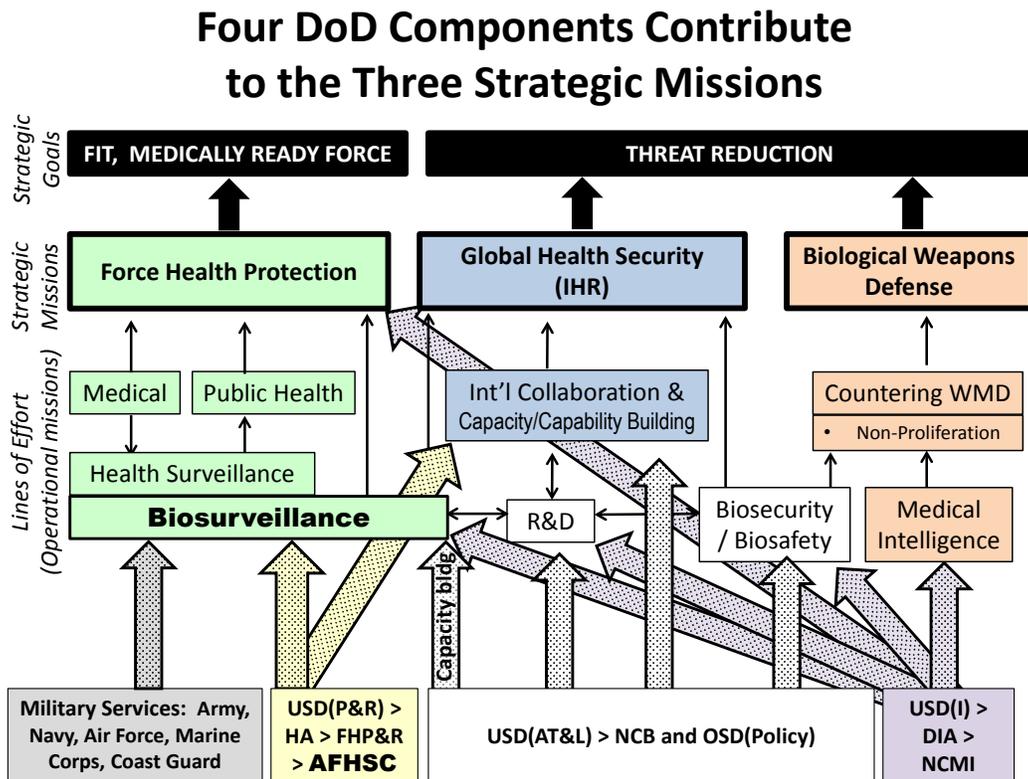
Figure S.1. Logic Model for DoD Biosurveillance



OMB Task 1: Identify a prioritized list of the program’s missions and desired outcomes, and develop performance measures and targets to track progress toward achieving those outcomes.

The DoD biosurveillance enterprise is not comprised of a single program; hence, the study team examined the DoD strategic missions to which biosurveillance contributes and prioritized those missions. Based on review of U.S. statute and international law, national policy, and DoD doctrine/policy, the team determined that the highest-priority strategic DoD mission relevant to biosurveillance is force health protection, followed by biological weapons defense (which itself also supports force health protection), and global health security. The first two are Congressionally mandated, and the third is mandated by national (Executive Branch) policy and one binding international treaty. DoD biosurveillance supports all three of these missions (Figure S.2).

Figure S.2. Missions Served by Key DoD Biosurveillance Organizations



On June 27, 2013, the White House issued fiscal year 2015 budget guidance that specifies priorities related to the National Strategy for Countering Biological Threats and the associated Global Health Security second-term agenda. Specifically, it asks federal agencies, including DoD, to align their relevant fiscal year 2015 budget requests with the eight priority objectives under larger aims to (a) prevent avoidable epidemics, (b) detect threats early, and (c) respond rapidly and effectively to biological threats of international concern. This issuance underscores the importance that the White House attaches to a U.S. global health security mission.

The National Strategy for Biosurveillance, issued in July 2012, suggests desired outcomes for biosurveillance. These are relevant to DoD biosurveillance as well:

- Early warning of threats and early detection of events
- Situational awareness
- Decision making at all levels, including acute response, policy, and research and development
- Forecast of impacts.

DoD biosurveillance supports the three strategic-level missions and four desired outcomes:

- NCMI in particular provides indicators and early warning and forecasting of impact
- AFHSC's Global Emerging Infections Surveillance and Response System (GEIS), NCMI, and the Cooperative Biological Engagement Program (CBEP) all contribute to

situational awareness globally; the Services and AFHSC's biosurveillance support situational awareness among military Service members

- All components of the DoD biosurveillance enterprise enable decision making by DoD, the U.S. government, and host nation officials

Biosurveillance programs can be prioritized based on the relative priority of these three strategic-level missions, with programs supporting force health protection accorded the highest priority.

Performance measures can monitor relevant actions, outputs, and outcomes. Development of performance measures and targets typically requires intensive efforts over months or years, but the study team identified a number of potentially relevant measures to be considered.

OMB Task 2: Evaluate how the current array of DoD biosurveillance program assets contributes to achieving these prioritized missions.

Assessment of the performance of DoD biosurveillance processes (systems and laboratories) indicates the following:

- DoD biosurveillance population and data coverage for military Service members are comprehensive; biosurveillance in Service members supports DoD's force health protection mission.
- DoD biosurveillance population and data coverage internationally cover syndromes and pathogens of relevance to partner countries and to DoD; international biosurveillance supports both the force health protection and global health security missions of DoD and also the broader U.S. government and global health security communities.
- The quality of DoD biosurveillance is higher than typical public health surveillance because of the availability of denominator data, standardized case definitions, and the high quality and high degree of testing performed by DoD laboratories.
- Very little data analysis by AFHSC is oriented to near-real-time situational awareness. More frequent (e.g., more daily) analyses and some additional data linkages could further enhance the value of DoD biosurveillance used for situational awareness purposes.

AFHSC produces more than 1,000 distinct recurrent reports each year, plus ad hoc reports and journal publications (65 articles published in AFHSC's *Medical Surveillance Monthly Report* and 60 additional papers published in peer-reviewed journals during fiscal year 2012). AFHSC produces no routine near-real-time reports for situational awareness purposes, although the final operating capability of its Division of Integrated Biosurveillance (DIB) envisages daily analysis and reporting, if resources become available. In contrast, NCMI presently conducts daily scans of 70–80 diseases of military interest across 165 countries, and produces reports from these.

Analysis of inputs (enabling functions) suggests that personnel shortages are likely the most significant hindrance to formalization and expansion of the biosurveillance enterprise capabilities and capacities. The AFHSC's chain of command (the Assistant Secretary of Defense [Health Affairs] or ASD[HA]) signed a Memorandum of Understanding (MOU) with the ASD(NCB) in 2012. The MOU recognizes AFHSC as the center for the emerging biosurveillance capability. In

2012, AFHSC established the DIB to oversee integration of biosurveillance efforts across DoD. The limiting enabler for the AFHSC—and therefore for the entire enterprise—is manpower within the DIB, which currently has only seven staff members. AFHSC currently has a total of 78 staff, which is sufficient to sustain current operations but not the added responsibilities associated with the MOU. Most of those new responsibilities fall under the DIB. Furthermore, the staff expertise required for the DIB is considerable: qualifications include significant DoD experience as well as a high level of epidemiological expertise. AFHSC’s current facilities can accommodate only 96 work spaces, not sufficient for the number of staff reflected in either past years of requests (110) or the February 2012 workload survey (134). Finally, AFHSC does not have its own classified terminals or classified computing facilities, which would enable it to better support integration across the DoD biosurveillance enterprise.

OMB Task 3: Assess whether the current funding system is appropriate and how it can be improved to assure stable funding.

DoD has a considerable investment in the biosurveillance enterprise. However, because there is no authority for a biosurveillance enterprise at the time of this report, there is no oversight mechanism for allocation of funds across the entire enterprise in a way to meet overarching goals and emerging needs. The funding systems that support each of the contributing organizations function well within those particular domains; however, there is no overall funding system.

Regarding stability, the Office of the ASD(NCB) has indicated that it expects relatively stable funding going forward in spite of the vulnerabilities and variations caused by the current cutbacks. NCMi is expecting significant cuts but does not anticipate a major compromise to its biosurveillance-related mission. AFHSC funding has been relatively stable in recent years, but, as noted above, current levels are insufficient for the additional responsibilities reflected in the MOU, according to AFHSC leaders. Moreover, formalization of the DoD biosurveillance enterprise—as reflected in the interim guidance issued by the Deputy Secretary of Defense on June 13, 2013, and the DoDD to follow in 12 months—could result in additional mission responsibilities for AFHSC. Because most of the new responsibilities under the MOU fall to AFHSC and the DIB, the near-term adequacy of AFHSC funding to fulfill both current and new responsibilities is more vulnerable than for the other key components of the DoD biosurveillance enterprise.

While there may still be funding shortages across the DoD biosurveillance enterprise, it is not inconceivable that agencies could share resources to advance common objectives. The entire enterprise would likely benefit from an oversight organization—for example, comprised of those charged to coordinate the tasks specified in the June 2013 interim guidance—to determine the feasibility and appropriateness of resource sharing, examine redundancies, and routinely review and synchronize the efforts of the stakeholders within the resource realities of the department.

In conclusion, well-integrated DoD biosurveillance can provide effective, efficient, and important support to all three relevant DoD strategic missions. These missions are, in turn, consistent with higher-level national health, security, and health security policy. Information from biosurveillance, as from any public health surveillance, “improves the efficiency and effectiveness of health services by targeting interventions and documenting their effect on the population” (Nsubuga, 2006). Absent formal cost-effectiveness analysis of the DoD biosurveillance enterprise, it is reasonable to conclude that modest marginal investments toward a more integrated and efficient DoD biosurveillance enterprise will yield positive returns to both DoD and the larger national and international community in health, economic, and global health security terms. AFHSC is well-positioned to serve as an effective hub for integrated DoD biosurveillance, but it appears to need additional staff and enhanced facilities to more robustly fulfill its current and potential future responsibilities. This is already important as AFHSC assumes additional responsibilities under the MOU between ASD(HA) and ASD(NCB) and will become increasingly important as biosurveillance is formally defined in DoD doctrine/policy and AFHSC’s activities are aligned with the National Strategy for Biosurveillance, the priorities specified in the June 2013 budget guidance for fiscal year 2015, and the associated Global Health Security second-term agenda.