



Federal Efforts to Address the Threat of Bioterrorism: Selected Issues for Congress

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Summary

Recent reports by congressional commissions and others, in combination with the inclusion of bioterrorism issues in President Obama's State of the Union address, have increased congressional attention to the threat of bioterrorism. Federal efforts to combat the threat of bioterrorism predate the anthrax attacks of 2001, but have significantly increased since then. These efforts have been developed as part of and in parallel with other defenses against conventional terrorism. The continued attempts by terrorist groups to launch attacks targeted at U.S. citizens have increased concerns that federal counterterrorism activities are insufficient to face the threat.

The federal government's efforts to address the perceived threat of bioterrorism span many different agencies and are organized and directed through several strategy and planning documents. These agencies have implemented numerous disparate actions and programs in their statutory areas to address the threat.

Despite these efforts, many experts, including congressional commissions, non-governmental organizations, and industry representatives, have highlighted weaknesses or flaws in the federal government's biodefense activities. Recent reports by congressional commissions have stated that the federal government's efforts to address the bioterrorism threat could be significantly improved.

Key questions face congressional policymakers in these areas: Are the efforts already underway sufficient to face the threat of bioterrorism? Have the federal investments to date met the expectations of Congress or other stakeholders? Should these existing programs be altered, augmented, or terminated in the current environment of fiscal challenge? What is the appropriate federal role in response to the threat of bioterrorism, and what mechanisms are most appropriate for involving other stakeholders, including state and local jurisdictions, industry, and others?

Congressional oversight of bioterrorism crosses the jurisdiction of many congressional committees. As a result, such oversight is often issue-based. Because of the diversity of federal biodefense efforts, a complete view of the complete federal bioterrorism effort is beyond the scope of this report. Instead, this report focuses on four areas critical to the success of the biodefense enterprise that the 111th Congress is likely to consider: strategic planning; risk assessment; surveillance; and the development, procurement, and distribution of medical countermeasures.

Congress, through authorizing and appropriations legislation and its oversight activities, continues to influence the federal response to the bioterrorism threat. Congressional policymakers will likely be faced with many difficult choices about the priority of maintaining, shrinking, or expanding existing programs versus creating new programs to address identified deficiencies. Augmenting such programs may incur additional costs in a time of fiscal challenges while maintaining or shrinking such programs may be deemed as incurring unacceptable risks, given the potential for significant casualties and economic effects from a large-scale bioterror attack.

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Introduction

Recent reports by congressional commissions and others, in combination with the inclusion of bioterrorism issues in President Obama's State of the Union address,¹ have increased congressional attention to the threat of bioterrorism. Federal efforts to combat the threat of bioterrorism predate the anthrax attacks of 2001, but have significantly increased since then. These efforts have been developed as part of and in parallel with other defenses against conventional terrorism. The continued attempts by terrorist groups to launch attacks targeted at U.S. citizens, including in transit to U.S. soil,² have increased concerns that federal counterterrorism activities, and the investments that underlie them, are insufficient to face the threat.

Experts differ in their assessments of the threat posed by bioterrorism. Some claim the threat is dire and imminent.³ The congressionally mandated Commission on the Prevention of WMD Proliferation and Terrorism concluded that

unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013.

The Commission further believes that terrorists are more likely to be able to obtain and use a biological weapon than a nuclear weapon.⁴

In contrast, other experts assert the bioterrorism threat is less severe or pressing than that posed by more conventional terrorism or other issues facing the United States.⁵ The Scientists Working Group on Biological and Chemical Weapons concluded that

Public health in the United States faces many challenges; bioterrorism is just one. Policies need to be crafted to respond to the full range of infectious disease threats and critical public

¹ President Obama stated, "And we are launching a new initiative that will give us the capacity to respond faster and more effectively to bioterrorism or an infectious disease—a plan that will counter threats at home and strengthen public health abroad." Office of the Press Secretary, The White House, *Remarks by the President in State of the Union Address*, January 27, 2010.

² See, for example, the purported attempt by Umar Farouk Abdulmutallab to detonate explosives in mid-flight on Northwest Airlines Flight 253 from Amsterdam, Netherlands, to Detroit, Michigan. See *Indictment in U.S. v. Abdulmutallab*, January 6, 2010. <http://www.mied.uscourts.gov/hpc/docs/1.Indictment.pdf>

³ For examples of experts who think the threat of bioterrorism is greater than has been recognized, see Richard Danzig, *Catastrophic Bioterrorism: What Is to Be Done?* Center for Technology and National Security, National Defense University, Washington, DC, August 2003, and The Commission on the Prevention of WMD Proliferation and Terrorism, *World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, December 2008.

⁴ The Commission on the Prevention of WMD Proliferation and Terrorism, *World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, December 2008, p. XV.

⁵ For examples of experts who downplay the threat posed by bioterrorism, see Milton Leitenberg, *Assessing the Biological Weapons and Bioterrorism Threat*, Strategic Studies Institute, U.S. Army War College, Washington, DC, 2005, and Scientists Working Group on Biological and Chemical Weapons, Center for Arms Control and Non-Proliferation, *Biological Threats: A Matter of Balance*, January 26, 2010.

health challenges rather than be disproportionately weighted in favor of defense against an exaggerated threat of bioterrorism.⁶

Federal efforts are often measured against the perceived magnitude of the threat. Thus, experts who believe bioterrorism poses a relatively low threat tend to conclude that the government has done too much. In contrast, experts who perceive a greater threat conclude that the federal government needs to do more, whether under existing programs or new ones. Many experts come to mixed conclusions: they regard some programs as effective but identify others as insufficient.

The federal government's biodefense efforts span many different agencies and vary widely in their resources, scope, and approach. For example, the Departments of State and Defense have engaged in nonproliferation and counterproliferation efforts.⁷ The Departments of State and Commerce have strengthened export controls of materials that could be used for bioterrorism.⁸ The Department of Health and Human Services (HHS) has made investments in public health preparedness; response planning;⁹ and research, development, and procurement of medical countermeasures against biological terrorism agents.¹⁰ The intelligence community has engaged in intelligence gathering and sharing regarding bioterrorism.¹¹ The Department of Justice performs background checks on people who want to possess certain dangerous pathogens.¹² The Department of Homeland Security (DHS) has engaged in preparedness, response, and recovery-related activities,¹³ developed increased capabilities in environmental biosurveillance (see "Biosurveillance" below), and invested in expanding domestic bioforensics capabilities.¹⁴ The

⁶ Scientists Working Group on Biological and Chemical Weapons, "Biological Threats: A Matter of Balance," *Bulletin of the Atomic Scientists*, February 2, 2010.

⁷ For information on these topics, see CRS Report RL31559, *Proliferation Control Regimes: Background and Status*, coordinated by Mary Beth Nikitin; CRS Report RL33865, *Arms Control and Nonproliferation: A Catalog of Treaties and Agreements*, by Amy F. Woolf, Mary Beth Nikitin, and Paul K. Kerr; and CRS Report RL34327, *Proliferation Security Initiative (PSI)*, by Mary Beth Nikitin.

⁸ Examples of such export control restrictions include the International Traffic in Arms Regulations (ITAR) and the Export Administration Regulations (EAR), which are the primary set of U.S. export control regulations, and other multilateral agreements, such as participation in the Australia Group.

⁹ For information on these topics, see CRS Report R40159, *Public Health and Medical Preparedness and Response: Issues in the 111th Congress*, by Sarah A. Lister.

¹⁰ For example, the National Institute of Allergy and Infectious Diseases (NIAID) developed an extensive research program into potential bioterrorism pathogens. See National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services, *NIAID Biodefense Research Agenda for CDC Category A Agents-Progress Report*, August 2003; National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services, *NIAID Biodefense Research Agenda for Category B and C Priority Pathogens*, January 2003; and National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services, *NIAID Strategic Plan for Biodefense Research-2007 Update*, September 2007. See also Public Health Emergency Medical Countermeasures Enterprise, Biomedical Advanced Research and Development Authority (BARDA), U.S. Department of Health and Human Services, *DRAFT BARDA Strategic Plan for Medical Countermeasure Research, Development, and Procurement*, July 5, 2007.

¹¹ For example, the National Counterterrorism Center has established a working group on chemical, biological, radiological, nuclear counterterrorism. See CRS Report R41022, *The National Counterterrorism Center (NCTC)—Responsibilities and Potential Congressional Concerns*, by Richard A. Best Jr. For an overview of homeland security related intelligence issues, see CRS Report RL33616, *Homeland Security Intelligence: Perceptions, Statutory Definitions, and Approaches*, by Mark A. Randol.

¹² For additional information on this program, see CRS Report R40418, *Oversight of High-Containment Biological Laboratories: Issues for Congress*, by Frank Gottron and Dana A. Shea.

¹³ For example, see Department of Homeland Security, *National Response Framework: Biological Incident Annex*, January 2008, http://www.fema.gov/pdf/emergency/nrf/nrf_BiologicalIncidentAnnex.pdf.

¹⁴ Bioforensics is the scientific analysis of biological evidence. The capability expansion includes the creation of the (continued...)

Environmental Protection Agency (EPA) has explored post-event infrastructure decontamination.¹⁵ Many agencies, jointly or separately, have invested in expanded biodefense infrastructure, including public and private high containment laboratories for research, diagnostic, and forensics purposes.¹⁶ Lastly, White House-led efforts and other coordinating groups have engaged in risk assessment and strategic planning exercises to coordinate and optimize federal investment against bioterrorism and response capabilities.¹⁷

Conflicting views of the bioterrorism threat and the breadth of the federal biodefense effort, which crosses congressional committee jurisdictions, complicate congressional oversight of the overall biodefense enterprise. In contrast to addressing the entirety of the biodefense enterprise at once, providing oversight and direction to individual components or agencies is relatively easy; but such an approach may be too narrowly focused to improve the overall efforts. An alternative to these approaches is to identify key areas or activities that shape the effort performed by different agencies. The Bush Administration identified four such “pillars” as organizing principles for the federal biodefense efforts: threat awareness; prevention and protection; surveillance and detection; and response and recovery.¹⁸ Each of these pillars may have several agencies performing critical parts of the activity. Congressional oversight and direction of biodefense efforts has followed a similar but not identical path. Congress has provided oversight and direction on the basis of both individual agency biodefense activity and on those cross-agency themes and policies deemed most important by congressional policymakers.

Because of the diversity of federal biodefense efforts, this report cannot address all aspects and associated programs related to this issue. Instead, this report focuses on four areas deemed critical to the success of the biodefense enterprise that the 111th Congress is likely to consider: strategic planning; risk assessment; surveillance; and the development, procurement, and distribution of medical countermeasures. This report also focuses on the effectiveness and sufficiency of programs implementing these aspects of the federal biodefense efforts, outside analysts’

(...continued)

National Bioforensic Analysis Center to be the lead federal facility to conduct and facilitate the technical forensic analysis and interpretation of materials recovered following a biological attack.

¹⁵ For additional information on EPA’s research in this area, see <http://www.epa.gov/NHSRC/decondeconrh.html>.

¹⁶ For more information on this expansion of capacity, see CRS Report R40418, *Oversight of High-Containment Biological Laboratories: Issues for Congress*, by Frank Gottron and Dana A. Shea.

¹⁷ The Obama Administration has released strategy documents addressing biodefense planning and response. See National Security Council, Executive Office of the President, *National Strategy for Countering Biological Threats*, November 2009, and Executive Order 13527, “Establishing Federal Capability for the Timely Provision of Medical Countermeasures Following a Biological Attack,” *75 Federal Register* 737-738, January 6, 2010. The Bush Administration released a series of homeland security strategies and presidential directives incorporating responses to the bioterrorism threat. Similarly, documents to establish cross-agency coordination, such as that developed by the National Science and Technology Council on foreign animal disease (Subcommittee on Foreign Animal Disease Threats, Committee on Homeland and National Security, National Science and Technology Council, *Protecting Against High Consequence Animal Diseases: Research & Development Plan for 2008-2012*, January 2007) or that developed by the Department of Homeland Security to coordinate homeland security research and development (Science and Technology Directorate, Department of Homeland Security, *Coordination of Homeland Security Science and Technology*, December 2007 (Revised January 2008)), have been released. Lastly, the federal government has tested its response capabilities through drills and exercises including responses to bioterrorism. One example would be the National Exercise Program (formerly TOPOFF exercises), which included bioterrorism scenarios in several cases. See CRS Report RL34737, *Homeland Emergency Preparedness and the National Exercise Program: Background, Policy Implications, and Issues for Congress*, coordinated by R. Eric Petersen.

¹⁸ The Executive Office of the President, “Biodefense for the 21st Century,” *Homeland Security Presidential Directive 10/HSPD-10*, April 28, 2004.

suggestions for improving the government's efforts, and current issues under congressional consideration. This report does not attempt to address all biodefense issues of potential congressional interest. The footnotes provide references to related CRS reports and other sources for further information.

Strategic Planning

Although the federal government had previously undertaken efforts to address the bioterrorism threat, the events of September 11, 2001, and the subsequent anthrax mailings led to an increased focus on terrorism in general and especially on biological weapons of mass destruction (WMDs). The Bush Administration established a homeland security apparatus within the White House.¹⁹ Congress and the Bush Administration established the DHS as a focal point in the federal preparedness, response, and recovery to terrorism and imbued it with a variety of new authorities.²⁰ In addition, the Bush Administration developed a series of national strategies and other guidance documents for homeland security generally and biodefense in specific.²¹ Beyond these cross-governmental strategy documents, many agencies developed more focused strategic plans for their individual operations against bioterrorism. The Obama Administration has continued this focus on bioterrorism by issuing additional guidance and directives.²²

Congress has acted to require federal strategic planning activities through provisions of the Homeland Security Act of 2002 and other legislation. As well as establishing DHS, Congress has created offices and agencies within other Cabinet departments and assigned them specific

¹⁹ Executive Order 13228 (October 8, 2001) and Homeland Security Presidential Directive-1 (October 29, 2001) established the Office of Homeland Security and the Homeland Security Council and created the position of Assistant to the President for Homeland Security. President Obama ordered a review of the White House organization for counterterrorism and homeland security through Presidential Study Directive 1 (February 23, 2009). The result of this review was reportedly to fold the Homeland Security Council into the National Security Council and merge the staff of the Homeland Security Council and the National Security Council into a single staff (Helene Cooper, "In Security Shuffle, White House Merges Staffs," *New York Times*, May 26, 2009).

²⁰ The Homeland Security Act of 2002 (P.L. 107-296) created the Department of Homeland Security. For an overview of the process of creating the department, see CRS Report RL31493, *Homeland Security: Department Organization And Management - Legislative Phase*, by Harold C. Relyea.

²¹ The Bush Administration released several national strategies to address homeland security for the nation, in which protecting against biological attack is included as a component. See, for example, Office of Homeland Security, *National Strategy for Homeland Security*, July 2002, and Homeland Security Council, *National Strategy for Homeland Security*, October 2007. The Obama Administration has released a strategy for countering biological threats. See National Security Council, Executive Office of the President, *National Strategy for Countering Biological Threats*, November 2009. Biodefense-related strategies and guidance include a series of presidential directives, such as The White House, "National Strategy to Combat Weapons of Mass Destruction," *Homeland Security Presidential Directive/HSPD-4*, December 2002; The White House, "Defense of United States Agriculture and Food," *Homeland Security Presidential Directive/HSPD-9*, January 30, 2004; The Executive Office of the President, "Biodefense for the 21st Century," *Homeland Security Presidential Directive 10/HSPD-10*, April 28, 2004; The White House, "Medical Countermeasures against Weapons of Mass Destruction," *Homeland Security Presidential Directive/HSPD-18*, January 31, 2007; and The White House, "Public Health and Medical Preparedness," *Homeland Security Presidential Directive/HSPD-21*, October 18, 2007.

²² For example, National Security Council, Executive Office of the President, *National Strategy for Countering Biological Threats*, November 2009; Department of Health and Human Services, *National Health Security Strategy of the United States of America*, December 2009; and Executive Order 13527, "Establishing Federal Capability for the Timely Provision of Medical Countermeasures Following a Biological Attack," *75 Federal Register* 737-738, January 6, 2010.

planning activities.²³ Finally, Congress established an office within the Executive Office of the President charged with preventing WMD proliferation and terrorism.²⁴

Policymakers, analysts, and other experts have criticized federal efforts at strategic planning.²⁵ With respect to the White House, some experts have criticized cross-agency planning as lacking metrics and measures, failing to encompass the full range of threats, and being insufficient to meet its stated goals.²⁶ Policymakers have critiqued efforts by federal agencies to develop multi-agency plans as lacking metrics.²⁷ Even when considering efforts within individual agencies, experts have levied criticisms of research plans, stating that the correspondence between strategic goals, operational outcomes, and program investments has not been made clear.²⁸

Options for Congress

Given these criticisms, Congress could choose to recommend changes in the strategic planning process, either government-wide or at the agency level, to address specific deficiencies. For example, Congress might require a more robust and transparent government-wide strategic plan articulating clear goals, metrics and priorities; the development of a national framework to organize and prioritize biodefense investments; or a periodic comprehensive report detailing biodefense activities government-wide. Alternatively, Congress might require the Administration to perform internal or external reviews of policies and activities to determine their sufficiency and then direct the Administration to formulate new or revised policies as recommended by the reviews.²⁹

Through its oversight activities, Congress may have a key position in assessing the completeness of ongoing planning. Because of the broad oversight responsibilities of congressional committees, synergies and duplications between agency efforts may be more apparent to congressional

²³ For example, through the Pandemic and All-Hazard Preparedness Act (P.L. 109-417), Congress created the Biodefense Advanced Research and Development Authority in HHS to plan and support the development of bioterrorism medical countermeasures.

²⁴ The Implementing Recommendations of the 9/11 Commission Act of 2007 (P.L. 110-53) created the Office of the United States Coordinator for the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, which is to be headed by a Senate-confirmed coordinator.

²⁵ See, for example, The Commission on the Prevention of WMD Proliferation and Terrorism, *World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, December 2008.

²⁶ See, for example, Al Mauroni, *Progress of "Biodefense for the 21st Century" – A Five-Year Evaluation*, 2009.

²⁷ See, for example, hearings held in the House regarding DHS efforts to develop a cross-governmental homeland security research and development plan. House Committee on Homeland Security, Subcommittee on Emerging Threats, Cybersecurity, and Science and Technology, "A Roadmap for Security? Examining the Science and Technology Directorate's Strategic Plan," *Serial No. 110-53*, June 27, 2007; House Committee on Homeland Security, Subcommittee on Emerging Threats, Cybersecurity, and Science and Technology, "The Future of Science and Technology at the Department of Homeland Security," *Serial No. 110-102*, April 01, 2008; and House Committee on Science and Technology, Subcommittee on Technology and Innovation, "Developing Research Priorities at DHS's Science and Technology Directorate," *Hearing*, October 27, 2009.

²⁸ See, for example, National Academy of Public Administration, *Department of Homeland Security Science and Technology Directorate: Developing Technology to Protect America*, June 2009.

²⁹ For example, the HHS *Interim Implementation Guide for the National Health Security Strategy of the United States of America* identifies a series of executive-branch-directed reviews of biodefense to be performed in the near future. Additionally, HHS has used select advisory boards to perform reviews or assessments of specific portions of the federal biodefense enterprise. See, for example, reports issued by the National Biodefense Science Board (NBSB) at <http://www.hhs.gov/aspr/omsph/nbsb/>.

policymakers than to decision-makers within individual agencies.³⁰ Congress, through its oversight activities, may also be able to identify areas where executive branch resource allocation does not reflect need or congressional intent. A congressional perspective may identify unnecessary duplication or gaps in federal planning for the various necessary stages of response to a bioterrorism event. Congress might mandate the augmentation of government-wide planning documents, such as the National Response Framework, or the development of a forward-looking planning document, similar to the Quadrennial Homeland Security Review³¹ or the National Strategy for Pandemic Influenza and its implementation guide,³² for cross-agency federal biodefense activities.

Some experts have suggested that congressional oversight of federal homeland security efforts might be optimized if fewer committees and subcommittees had jurisdiction over homeland security.³³ Proponents with this perspective argue that congressional oversight would become more focused and holistic because of the centralization of oversight authority. Additionally, this might reduce the amount of time homeland security officials spend testifying before Congress. Alternatively, such consolidation might decrease the level of congressional scrutiny, since fewer committees with broader homeland security mandates might have less time and resources to focus on individual agencies and activities.

Risk Assessment

Ideally, a full understanding of the risk posed by bioterrorism would underpin the government's biodefense efforts. By understanding the bioterrorism risk, the federal government could determine the appropriate level of federal response and investment against this risk. The Government Accountability Office (GAO) has called for increased risk assessment activities in biodefense for many years.³⁴ Unfortunately, the nature of the bioterrorism threat, with its high consequences and low frequency, makes determining the bioterrorism risk difficult. Additionally,

³⁰ For example, investigation by the Government Accountability Office identified the duplication and potential waste of anthrax vaccine occurring in the Department of Defense and the Department of Health and Human Services. Government Accountability Office, "Project BioShield: Actions Needed to Avoid Repeating Past Mistakes," *GAO-08-208T*, October 23, 2007.

³¹ The Implementing Recommendations of the 9/11 Commission Act of 2007 (P.L. 110-53) amended the Homeland Security Act of 2002 to require a quadrennial homeland security review. The first such review was issued in February 2010. See Department of Homeland Security, *Quadrennial Homeland Security Review: A Strategic Framework for a Secure Homeland*, February 2010.

³² Homeland Security Council, Executive Office of the President, *National Strategy for Pandemic Influenza*, November 2005 and Homeland Security Council, Executive Office of the President, *National Strategy for Pandemic Influenza Implementation Plan*, May 2006.

³³ Both the 9/11 Commission and the Commission on the Prevention of WMD Proliferation and Terrorism recommended that Congress create a single committee in each chamber for oversight and review of homeland security (National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report*, p. 421 and Commission on the Prevention of WMD Proliferation and Terrorism, *World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, December 2008, p. 91). Other groups have also called for change in the current congressional oversight of the Department of Homeland Security (Jena Baker McNeill, Heritage Foundation, "Homeland Security Oversight Reform Requires Leadership," *WebMemo 2143*, November 25, 2008).

³⁴ For example, the Government Accountability Office identified a need for comprehensive threat and risk assessments of chemical and biological attacks in the terrorism context prior to the 2001 anthrax attacks (Government Accountability Office, "Combating Terrorism: Need for Comprehensive Threat and Risk Assessments of Chemical and Biological Attacks," *GAO/NSIAD-99-163*, September 1999).

the presence of an intelligent adversary who can adapt to the presence of successful countermeasures complicates the use of standard risk assessment techniques.³⁵ Despite these challenges, risk assessment activities can help agencies use risk-informed decision-making processes to plan, prioritize, and invest wisely. In contrast, investment based on uninformed hypotheses or on an ad hoc basis may allow certain risks to go unmitigated if not properly identified or assessed; or result in overinvestment in risks that are less than others.

The Bush Administration identified bioterrorism risk assessment as a key component of its biodefense strategy. As a consequence, DHS engages in a bioterrorism risk assessment process on a two-year cycle. Other agencies also engage in risk assessment activities, but they vary from DHS's efforts in approach, assumptions, emphasis, and purpose.

Risk assessment processes depend heavily on the information used as input, the quantitative and qualitative factors used to interpret that information, and the robustness of the assessment process. These factors complicate comparisons of bioterrorism risk assessments performed for different purposes or with assessments of other threats. The DHS has begun this comparison on a limited scale,³⁶ but its use of these risk assessments for planning purposes has been strongly criticized by outside experts who assert these risk assessments do not adequately address the decision-making process of the terrorist.³⁷ Regardless of the complexity of the risk assessment methodology, due to the inherent uncertainties associated with assessing risk in a counterterrorism context, some level of flexibility in managing risk may be necessary.³⁸

Options for Congress

A key question for congressional policymakers is the extent to which bioterrorism and other risk assessments should inform agency and government-wide priorities and policies. Congress could mandate risk-informed decision making based on the intelligence community's assessment of current and future bioterrorism-related threats, endorse a particular risk assessment method, or require the establishment of measures of robustness. It could require agencies to harmonize their risk assessment methodologies or mandate the development of a government-wide risk assessment process rather than individual agency-level assessments. Alternatively, Congress could direct agencies to rely less on the risk assessment process and instead set priorities based on other factors, such as expert judgment.

³⁵ Even defining the adversary presents a challenge. For example, the adversary could be defined alternatively as foreign or domestic individuals, cells, or transnational organizations with or without access to state-sponsored resources. Different definitions of adversary may dramatically alter risk assessments and thus the government efforts to respond to the risk posed.

³⁶ Homeland Security Directive 18 directs DHS to create a risk assessment that considers chemical, biological, radiological, and nuclear threats.

³⁷ National Research Council, Committee on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis, *Department of Homeland Security Bioterrorism Risk Assessment: A Call for Change*, Washington, DC: National Academies Press, 2008.

³⁸ For a discussion on DHS's risk assessment processes, see CRS Report RL33858, *The Department of Homeland Security's Risk Assessment Methodology: Evolution, Issues, and Options for Congress*, by Todd Masse, Siobhan O'Neil, and John Rollins.

Biosurveillance

Unlike most other terrorist attacks, a bioterrorism attack may not be immediately apparent. Victims may not develop symptoms for days or weeks following exposure. The first indication of a successful bioterrorism attack might be the discovery of infected individuals by health practitioners. The Bush Administration prioritized the development and deployment of biosurveillance technologies in an attempt to identify a bioterrorism attack as soon after an attack as possible.³⁹ The earlier an attack could be identified, the earlier treatment of the exposed individuals could begin. Earlier treatment generally increases the likelihood of individual recovery and survival.⁴⁰

The Bush Administration implemented a number of different detection approaches, including environmental detection, syndromic surveillance,⁴¹ and information sharing.⁴² Through these efforts, the federal government aims to identify bioterrorism events at various scales, ranging from large, aurally disseminated releases to smaller releases infecting only a few individuals. The federal government, in collaboration with state and local jurisdictions, enhanced the existing network of public health laboratories to ensure that diagnostic laboratories could correctly handle and analyze clinical samples related to potential bioterrorism events.⁴³ Similarly, the federal government has continued to invest in some global health activities partly in order to help identify when an emerging disease might pose a threat to the United States.⁴⁴

Various government and outside experts have criticized or supported these efforts.⁴⁵ Widespread deployment of environmental biosurveillance technologies began after the anthrax mailings, and federal efforts to further develop these technologies have also increased. Questions remain regarding the effectiveness of their detection ability, especially in comparison to the innate detection ability of the medical system through astute physicians. A repeated criticism of biosurveillance activities is that the detection system may not be sufficiently sensitive and

³⁹ President Bush announced during the 2003 State of the Union address the deployment of the “nation’s first early warning network of sensors to detect biological attack” (Executive Office of the President, The White House, *State of the Union Address*, January 28, 2003).

⁴⁰ Computer modeling has shown that the number of casualties and fatalities resulting from a biological attack increases if treatment is delayed. See, for example, L.M. Wein, D.L. Craft, and E.H. Kaplan, “Emergency Response to an Anthrax Attack,” *Proc. Natl. Acad. Sci.*, 100(7), 2003, pp. 4346-51.

⁴¹ The term applies to using health-related data that precede diagnosis as a signal of an outbreak or possible bioterrorist attack. See <http://www.cdc.gov/ncphi/diss/nndss/syndromic.htm>.

⁴² These activities included the deployment of the BioWatch program, the development of the Biological Warning and Incident Characterization system, and the establishment of the National Biosurveillance Integration Center through the Department of Homeland Security, the establishment of the BioSense Program through the Centers for Disease Control and Prevention (CDC), and the expansion of the Electronic Surveillance System for Early Notification of Community-based Epidemics, or ESSENCE, program in the Department of Defense.

⁴³ For more on the Laboratory Response Network, see <http://www.bt.cdc.gov/lrn/>.

⁴⁴ For example, see CRS Report R40239, *Centers for Disease Control and Prevention Global Health Programs: FY2001-FY2010*, by Tiaji Salaam-Blyther.

⁴⁵ See, for example, Government Accountability Office, “Biosurveillance: Developing a Collaboration Strategy Is Essential to Fostering Interagency Data and Resource Sharing,” *GAO-10-171*, December 18, 2009; Government Accountability Office, “Biosurveillance: Preliminary Observations on Department of Homeland Security’s Biosurveillance Initiatives,” *GAO-08-960T*, July 16, 2008; and National Research Council, *BioWatch and Public Health Surveillance: Evaluating Systems for the Early Detection of Biological Threats. Abbreviated Version: Summary*, December 7, 2009.

dependable to allow for a federal response following detection of a bioterrorism event.⁴⁶ Technical difficulties persist in making a detection system sufficiently sensitive to detect very low levels of pathogens while maintaining a very low number of false alarms. Frequent false alarms pose a high cost in terms of resource consumption and responder opportunity costs. Additionally, frequent false alarms may lead responders and the public to assume that all alarms are likely to be false and thus they may not take alarms seriously. Other widely discussed issues include the extent to which the federal government should protect the population of the United States with such systems, through environmental sensing or other methods, and how the federal government should deploy systems that are only available in limited numbers.

Options for Congress

Congress is likely to remain interested in these programs. Development and deployment of the next generation of environmental detectors has been slower than DHS originally predicted.⁴⁷ Congress could provide additional funds, oversight, or guidance to encourage the completion of the deployment of these detectors. Congress may seek to determine whether the current plans for capabilities and coverage of surveillance sufficiently protect the population. Congress may also address concerns about the interactions between DHS and local jurisdictions. Local jurisdictions have identified fiscal burdens from this federal program, and questions remain about their proper role in the response to positive test results. Congress could attempt to alleviate these concerns by providing additional resources to local jurisdictions or by providing additional guidance to DHS regarding its relationships with local jurisdictions.

Medical Countermeasures

Effective medical countermeasures⁴⁸ could significantly decrease the impact of a bioterrorist attack. The federal government has devoted many resources to the development, procurement, and distribution of medical countermeasures that could help respond to a bioterrorist attack. Since 2001, the federal government has often reexamined programs in these areas. Outside observers, Congress, and the executive branch have scrutinized, suggested improvements to, and further refined these policies.⁴⁹

⁴⁶ See, for example, testimony by Tara O'Toole, Director, Center for Biosecurity of University of Pittsburgh Medical Center, before the Senate Committee on Homeland Security and Governmental Affairs, October 23, 2007. Dr. O'Toole is now the DHS Under Secretary for Science and Technology.

⁴⁷ House Committee on Appropriations, Subcommittee on Homeland Security, "House Appropriations Subcommittee on Homeland Security Holds Hearing on Biosurveillance Investments," *Hearing Transcript*, February 25, 2010.

⁴⁸ Medical countermeasures include vaccines, antiviral, antibiotic, and other therapeutic medications.

⁴⁹ See, for example, Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, *Prevention of WMD Proliferation and Terrorism Report Card*, January 2010; C. Maher and B.D. Lushniak, "Availability of Medical Countermeasures for Bioterrorism Events: US Legal and Regulatory Options," *Clinical Pharmacology & Therapeutics*, 85, June 2009, pp. 669-671; and The White House, *Executive Order - Medical Countermeasures Following a Biological Attack*, December 30, 2009.

Research and Development

Many potential bioterrorism agents lack available medical countermeasures.⁵⁰ Therefore, the federal government has invested billions of dollars in research and development that might lead to effective medical countermeasures. The Department of Health and Human Services has played a key role in supporting the development of medical countermeasures, mainly through the National Institutes of Health (NIH) and the Biomedical Advanced Research and Development Authority.⁵¹ Additionally, efforts undertaken by the Department of Defense to protect warfighters may also contribute to civilian biodefense.⁵²

Some scientists have criticized the federal investment in biodefense countermeasures. They claim that the large investment in biodefense is not justified by the relative threat of bioterrorism and that these efforts would provide greater benefits if directed to other areas of research and development, such as more conventional public health threats.⁵³ Additionally, Congress has questioned the balance of investment among the various stages of research and development, identifying funding gaps that may pose barriers to the conversion of research results into deployable countermeasures. Congress also identified deficiencies in executive branch management of the countermeasure development process. These observations led Congress to establish the Biomedical Advanced Research and Development Authority to fund and coordinate the conversion of promising research results into deployable products.⁵⁴

Options for Congress

Policymakers often face the challenge of determining the optimal balance of funding between competing stages of the research and development process. While Congress has supported a historic increase in biodefense-related basic research funding at NIH, critics have suggested that the federal government has underfunded the next stages of research and development that are critical for converting promising research results into usable products.⁵⁵ Current fiscal pressures will likely exacerbate the difficult decisions regarding appropriate funding levels. Policymakers may also continue to consider whether the dominant role of the federal government in

⁵⁰ For the list of the Department of Health and Human Services top priority needed countermeasures, see Public Health Emergency Medical Countermeasures Enterprise, U.S. Department of Health and Human Services, *HHS Public Health Emergency Medical Countermeasure Enterprise Implementation Plan for Chemical, Biological, Radiological and Nuclear Threats*, April 2007, p. 10.

⁵¹ See, for example, Public Health Emergency Medical Countermeasures Enterprise, Biomedical Advanced Research and Development Authority (BARDA), U.S. Department of Health and Human Services, *DRAFT BARDA Strategic Plan for Medical Countermeasure Research, Development, and Procurement*, July 5, 2007.

⁵² One such example is the Transformational Medical Technologies Initiative (TMTI), a Department of Defense initiative to better prepare and protect the warfighter against emerging, genetically engineered, and unknown biothreat agents. For more information on TMTI, see Chemical and Biological Defense Program, Department of Defense, *Transformational Medical Technologies Initiative (TMTI) – OUSD (AT&L) FY2007*, online at <http://www.acq.osd.mil/cp/cbdreports/tmti.pdf>.

⁵³ For example, Scientists Working Group of Biological and Chemical Weapons, Center for Arms Control and Non-Proliferation, *Biological Threats: A Matter of Balance*, January 26, 2010.

⁵⁴ The Pandemic and All-Hazards Preparedness Act of 2006 (PAHPA; P.L. 109-417) established the Biomedical Advanced Research and Development Authority.

⁵⁵ See, for example, Alliance for Biosecurity, *Letter to President Barack Obama*, September 15, 2009, <http://www.allianceforbiosecurity.org/pdf/2277113.pdf>, or Center for Biosecurity of the University of Pittsburgh Medical Center, *Letter to President Barack Obama*, March 9, 2009, http://www.upmc-biosecurity.org/website/resources/commentary/2009-03-09-white_house_barda_fy10.html.

countermeasure research and development should be reduced in favor of a greater role for investment by industry. Congress may again consider incentive-based approaches such as tax cuts and credits or patent protections, or demand-based approaches, such as increased funding to support larger contract awards.⁵⁶ Alternatively, Congress might conclude that the government needs to take a larger role in developing countermeasures in areas where the private sector has failed to produce desired countermeasures.

Procurement

The federal government is by far the largest procurer of bioterrorism medical countermeasures. It stockpiles them and keeps them ready for deployment to respond to a bioterrorism event.⁵⁷ The relatively small market for most bioterrorism countermeasures provides little incentive for companies to invest in developing a countermeasure when compared with the larger potential market of other products of the same industry, such as anti-cholesterol drugs. The federal government has experienced difficulties in obtaining desired countermeasures because of this relatively small market. The executive branch and Congress have taken several steps to encourage companies to enter the medical countermeasure field. These activities include providing liability protection to companies developing medical countermeasures, guaranteeing a government market for countermeasures, and more clearly communicating the government's countermeasure needs and priorities.⁵⁸ These efforts have met with mixed success.⁵⁹ In the face of a need for medical countermeasures against emerging natural threats, such as pandemic influenza, HHS has also invested in medical countermeasure infrastructure to provide a more rapid response.⁶⁰

A variety of experts, commissions, and policymakers have assailed these efforts as being underfunded, unclear, or insufficient.⁶¹ Given the large costs of bringing a product to market, government assurances of a planned purchase seem to be insufficient to entice companies into this field. Private companies faced with the potential for liability following adverse reactions to a fielded medical countermeasure are sometimes reluctant to develop countermeasures. This led Congress to enact measures to protect companies from such liability.⁶² Companies and think tanks have continued to state that the government should better communicate to developers the

⁵⁶ Previous congresses considered such provisions including S. 975 in the 109th Congress. See CRS Report RL32917, *Bioterrorism Countermeasure Development: Issues in Patents and Homeland Security*, by Wendy H. Schacht and John R. Thomas.

⁵⁷ The federal government maintains a Strategic National Stockpile of certain medical countermeasures against national need. This stockpile is regularly rotated and thus serves as a continuing government demand for certain medical countermeasures.

⁵⁸ See CRS Report R41033, *Project BioShield: Authorities, Appropriations, Acquisitions, and Issues for Congress*, by Frank Gottron.

⁵⁹ For recent commentary, see Government Accountability Office, "Project BioShield Act: HHS Has Supported Development, Procurement, and Emergency Use of Medical Countermeasures to Address Health Threats," *GAO-09-878R*, July 24, 2009, and Government Accountability Office, "Project BioShield: HHS Can Improve Agency Internal Controls for Its New Contracting Authorities," *GAO-09-820*, July 2009.

⁶⁰ CRS Report R40554, *The 2009 Influenza Pandemic: An Overview*, by Sarah A. Lister and C. Stephen Redhead.

⁶¹ The Commission on the Prevention of WMD Proliferation and Terrorism, *World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, December 2008, and Center for Biosecurity of the University of Pittsburgh Medical Center, *Letter to President Barack Obama*, March 9, 2009, http://www.upmc-biosecurity.org/website/resources/commentary/2009-03-09-white_house_barda_fy10.html.

⁶² CRS Report RS22327, *Pandemic Flu and Medical Biodefense Countermeasure Liability Limitation*, by Edward C. Liu.

countermeasures it would like to procure. Think tanks and industry have also criticized actions they interpret as weakening the government's commitment to guaranteeing a government market by diverting funds designated for that program to other uses.⁶³ This may be interpreted as reinforcing industry's fear that the government is an unreliable partner in the development enterprise. In addition, GAO has cautioned against the federal government failing to have and make clear expectations regarding countermeasure and company performance.⁶⁴

Options for Congress

Congressional policymakers will likely face decisions in the 111th Congress regarding the transfer of funds from an account designated for the procurement of countermeasures to one that is devoted to the development of countermeasures.⁶⁵ In addition, policymakers may be called upon to assess whether previously enacted programs are succeeding in drawing new investors into countermeasure manufacturing, or whether other, more novel manufacturing incentives need to be considered. Congress may also examine whether the procurement prioritization matches the risk assessments and the strategic plans developed by the executive branch. Finally, the results of a recently announced end-to-end assessment of HHS's investment strategy may provide recommendations and requests for congressional action.⁶⁶

Distribution

Even when effective medical countermeasures against potential bioterrorism pathogens exist, their distribution to individuals affected by an attack remains a challenge. The federal government has attempted to address this need through programs that stockpile and distribute stores of medical countermeasures, the development of alternative distribution mechanisms outside the normal health care setting, and the consideration of other options, such as pre-event distribution or prophylaxis.⁶⁷

⁶³ For a discussion of this issue, see CRS Report R41033, *Project BioShield: Authorities, Appropriations, Acquisitions, and Issues for Congress*, by Frank Gottron.

⁶⁴ Government Accountability Office, *Project BioShield: Actions Needed to Avoid Repeating Past Problems with Procuring New Anthrax Vaccine and Managing the Stockpile of Licensed Vaccine*, GAO-08-88, October 23, 2007.

⁶⁵ Over \$1 billion has been transferred out of the Project BioShield fund for procuring medical countermeasures to support countermeasure research and development and pandemic influenza preparedness. For further discussion of the policy implications of these transfers, see CRS Report R41033, *Project BioShield: Authorities, Appropriations, Acquisitions, and Issues for Congress*, by Frank Gottron.

⁶⁶ Department of Health and Human Services, *Interim Implementation Guide for the National Health Security Strategy of the United States of America*, December 2009, p.18. The National Defense Science Board and the Institute of Medicine have recommended ways to encourage industry participation in countermeasure development. See National Biodefense Science Board, *Optimizing Industrial Involvement in Medical Countermeasure Development: A Report of the National Biodefense Science Board*, February 2010 and Institute of Medicine, *The Public Health Emergency Medical Countermeasures Enterprise: Innovative Strategies to Enhance Products from Discovery through Approval, An Institute of Medicine Workshop*, February 2010.

⁶⁷ These programs include the Strategic National Stockpile (see <http://www.bt.cdc.gov/stockpile/>); the MedKit pilot program of personal medical stockpiles provided by the government and stored at home (see <http://www.bt.cdc.gov/agent/anthrax/prep/pdf/medkit-evaluation-summary-2007.pdf>), and the use of the U.S. Postal Service to distribute countermeasures (see Executive Order 13527, "Establishing Federal Capability for the Timely Provision of Medical Countermeasures Following a Biological Attack," 75 *Federal Register* 737-738, January 6, 2010).

Experts have especially focused on the ability of the federal and state governments to distribute medical countermeasures to those infected in a timely way so as to minimize casualties and fatalities. Much of a successful bioterrorism response relies on the provision of effective medical countermeasures to the exposed. Experts question whether the federal government can distribute federal stockpiles to states and localities in the midst of an emergency, whether state governments have sufficient manpower or organization to receive federal stockpiles and effectively disseminate them, and whether alternative mechanisms of distribution have been sufficiently well conceptualized and practiced.⁶⁸

Options for Congress

Congress may be faced with decisions regarding the acceptable ways to disseminate medical countermeasures in an emergency situation, the role of the federal government during a bioterrorism event, and whether the advantages of alternative distribution mechanisms outweigh the potential drawbacks of lowered oversight and control of countermeasure use.

Conclusion

While no mass-casualty bioterrorism event has yet occurred, some experts and policymakers assert that terrorist organizations are attempting to develop such a capability.⁶⁹ The federal government has been preparing for a bioterrorism event for many years. Multiple programs in many agencies attempt to prepare for and respond to a bioterrorism event. Whether these programs are sufficient, redundant, excessive, or need improvement has been a topic of much debate. Congress, through oversight activities as well as authorizing and appropriations legislation, continues to influence the federal response to the bioterrorism threat. Congressional policymakers will likely be faced with many difficult choices about the priority of maintaining, shrinking, or expanding existing programs versus creating new programs to address identified deficiencies. Augmenting such programs may incur additional costs in a time of fiscal challenges while maintaining or shrinking such programs may be deemed as incurring unacceptable risks, given the potential for significant casualties and economic effects from a large-scale bioterror attack.

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⁶⁸ For one view of the state of public health preparedness for bioterrorism, see Trust for America's Health, *Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism 2009*, December 2009. The Cities Readiness Initiative is a Centers for Disease Control and Prevention program to help local jurisdictions improve their distribution capabilities. See <http://emergency.cdc.gov/cri/facts.asp>.

⁶⁹ See, for example, Rolf Mowatt-Larssen, *Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality? A Timeline of Terrorists' Efforts to Acquire WMD*, January 2010.