

## BILLIONS FOR BIODEFENSE: FEDERAL AGENCY BIODEFENSE FUNDING, FY2008-FY2009

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Since 2001, the United States government has spent substantial resources on preparing the nation against a bioterrorist attack. Earlier articles in this series analyzed civilian biodefense funding by the federal government from fiscal years 2001 through 2008. This article updates those figures with budgeted amounts for fiscal year 2009, specifically analyzing the budgets and allocations for biodefense at the Departments of Health and Human Services, Homeland Security, Defense, Agriculture, and State and the Environmental Protection Agency and the National Science Foundation.

IN THE PRESIDENT'S FISCAL YEAR (FY) 2009 budget, the eighth and final budget year of the Bush administration and the seventh budget since the terrorist attacks of September and October 2001, the President proposes approximately \$8.01 billion in federal funding for civilian biodefense programs, bringing the total funding for civilian biodefense to \$49.66 billion from FY2001 to FY2009 (Table 1). The FY2009 Presidential biodefense budget represents approximately 0.26% of the total FY2009 U.S. federal budget of \$3.107 trillion.<sup>1</sup> It should be noted that many of the programs included in this 0.26% of the budget are intended not only to improve preparedness for and resilience to bioattacks, but also to improve understanding of and response to infectious diseases and other disasters more broadly.<sup>2,3</sup>

In the context of other defense-related funding, 0.26% is a small percentage. For example, the Department of Homeland Security's (DHS) proposed budget for FY2009 is 1.3% of the total federal budget, and the Department of Defense's (DoD) budget is approximately 21.0% of the total.<sup>4</sup> As a subset of defense funding, missile defense programs would receive over \$4 billion more than the amount proposed for all biodefense programs included in this analysis for FY2009, with a record high of \$12.3 billion, or 0.40% of the federal budget.<sup>5</sup>

Based on analyses from previous "Billions for Biodefense" articles,<sup>6-9</sup> federal funding for civilian biodefense rose incrementally from FY2001 to FY2004. Excluding Project BioShield funds, which were appropriated in FY2004 but have been allocated and used over multiple fiscal years, biodefense funding peaked at \$6.05 billion in FY2004 and then generally declined through FY2008. The civilian biodefense budget for FY2009 represents a proposed increase of \$417.3 million over FY2008 estimates when BioShield is excluded from the total, and, when BioShield is included, it represents an increase of \$2.59 billion (Table 1, Figure 1).

As in previous budgets, the majority of proposed biodefense funding for FY2009 is directed toward the Department of Health and Human Services (HHS). HHS would receive \$4.17 billion (52%) of the \$8.01 billion total for FY2009—a proposed increase of \$169.4 million over FY2008 estimates (Figure 2). DHS would also receive a large portion of the biodefense funding for FY2009 with \$2.54 billion, or 32% of the total (Figure 2). This is a large increase for DHS (\$2.19 billion over FY2008 estimates), due primarily to the allocation of \$2.175 billion in multi-year BioShield funds.

Additionally, the President's budget requests increases for 4 of the 7 remaining federal agencies involved in biode-

Table 1. U.S. Government Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
Department of Health and Human Services	271.0	2,940.0	3,738.0	4,216.9	4,148.2	4,132.3	4,066.3	4,004.0	4,173.4	31,690.1
Department of Homeland Security <sup>a,b,c</sup>	—	—	422.0	1,788.0	2,981.0	567.3	353.8	357.5	2,544.3	9,013.9
Department of Defense	390.3	903.9	503.4	606.6	596.3	566.2	592.6	621.5	737.0	5,517.8
Department of Agriculture <sup>d</sup>	—	—	200.0	109.0	298.0	247.0	186.0	186.0	277.0	1,503.0
Environmental Protection Agency	20.0	187.2	132.9	118.7	97.4	129.1	153.1	164.4	196.9	1,199.7
Department of State	3.8	70.9	67.2	67.1	67.2	71.1	62.2	56.9	64.0	530.4
National Science Foundation	0.0	9.0	31.3	31.0	31.0	31.3	26.9	25.0	15.0	200.4
<b>Total USG Civilian Biodefense Funding</b>	<b>685.1</b>	<b>4,111.0</b>	<b>5,094.8</b>	<b>6,937.3</b>	<b>8,219.1</b>	<b>5,744.3</b>	<b>5,440.9</b>	<b>5,415.2</b>	<b>8,007.5</b>	<b>49,655.2</b>
Total USG Civilian Biodefense Funding (minus BioShield funds)	685.1	4,111.0	5,094.8	6,052.3	5,712.2	5,744.3	5,440.9	5,415.2	5,832.5	
BioShield Funds	—	—	—	885.0	2,507.0	—	—	—	2,175.0	
<b>Spent through FY2008</b>	<b>41,647.7</b>									
<b>Spent through FY2008 + FY2009 Budget</b>	<b>49,655.2</b>									

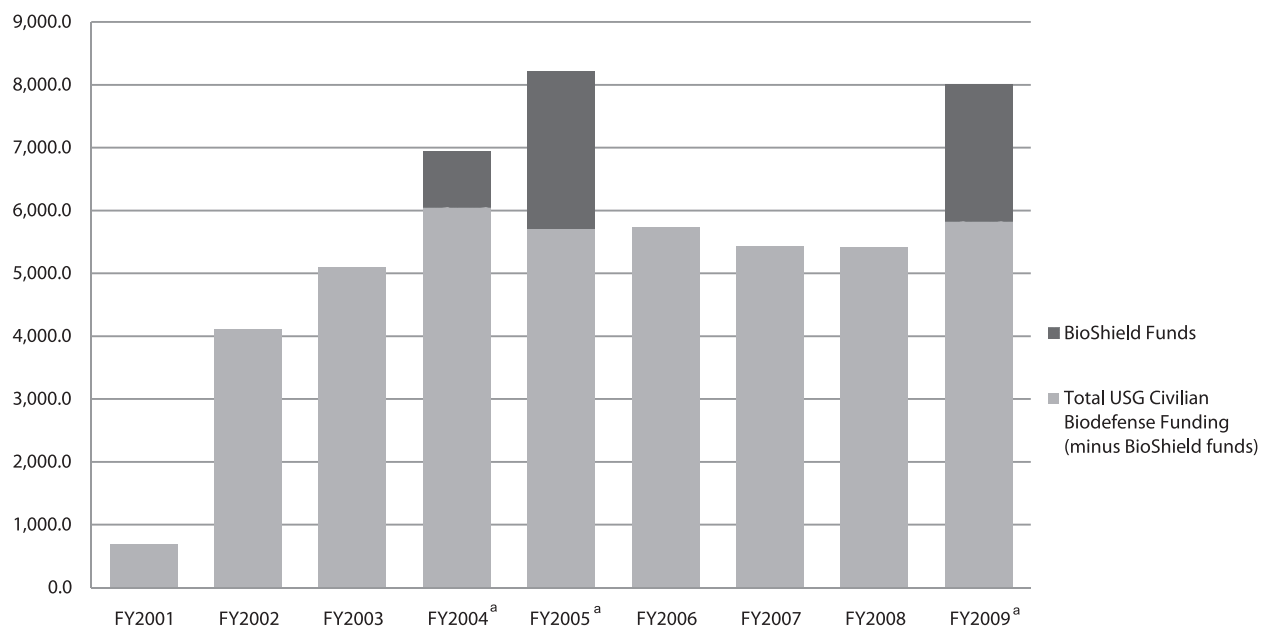
<sup>a</sup>The Department of Homeland Security (DHS) was created in FY2003.

<sup>b</sup>DHS was unable to provide complete data. Accordingly, some items are missing. See Table 3.

<sup>c</sup>DHS FY2004 and FY2005 budgets include one-time advanced appropriations for Project BioShield of \$890 million and \$2.5 billion, respectively, obligated for use through FY2008. The FY2009 budget also includes a one-time advanced BioShield appropriation of \$2.2 billion, obligated for use through FY2013.

<sup>d</sup>FY2001-FY2002 numbers not available due to budget methods used by USDA.

*Sources:* Congressional Budget Office; HHS Budget Office; HHS Press Office; HHS Budgets in Brief FY2006-FY2009; Pandemic and All Hazards Preparedness Act (Public Law 109-417); DHS Budget; DHS Press Office; DHS Program Officials; DoD RDT & E Defense-Wide Budget; DoD FY2009 Budget Justifications; Department of the Army FY2009-2010 Budget Justification; USDA Budget; EPA Budgets in Brief; U.S. Department of State Public Communication Division; U.S. Department of State Budget in Brief FY2009; NSF Budget in Brief FY2009.



<sup>a</sup> A total of \$5.6 billion was appropriated to a Project BioShield Special Reserve fund in FY2004. Of the \$5.6B fund, \$885 million and \$2.507 billion were allocated to DHS in FY2004 and FY2005, respectively, and were obligated for use through FY2008. \$2.175 billion in BioShield funds has been allocated to DHS in the FY2009 budget and is obligated for use through FY2013.

Figure 1. Civilian Biodefense Funding by Fiscal Year, FY2001-FY2009 (in \$millions)

fense. The largest proposed increase (other than DHS and HHS) is a \$115 million allocation to the Department of Defense, primarily for their Medical Biological Defense Program, followed by a proposed \$91 million increase for

the U.S. Department of Agriculture (USDA) for enhancement of their Food and Agricultural Defense Initiatives. Funding increases have also been requested for the Environmental Protection Agency (EPA) and the Department

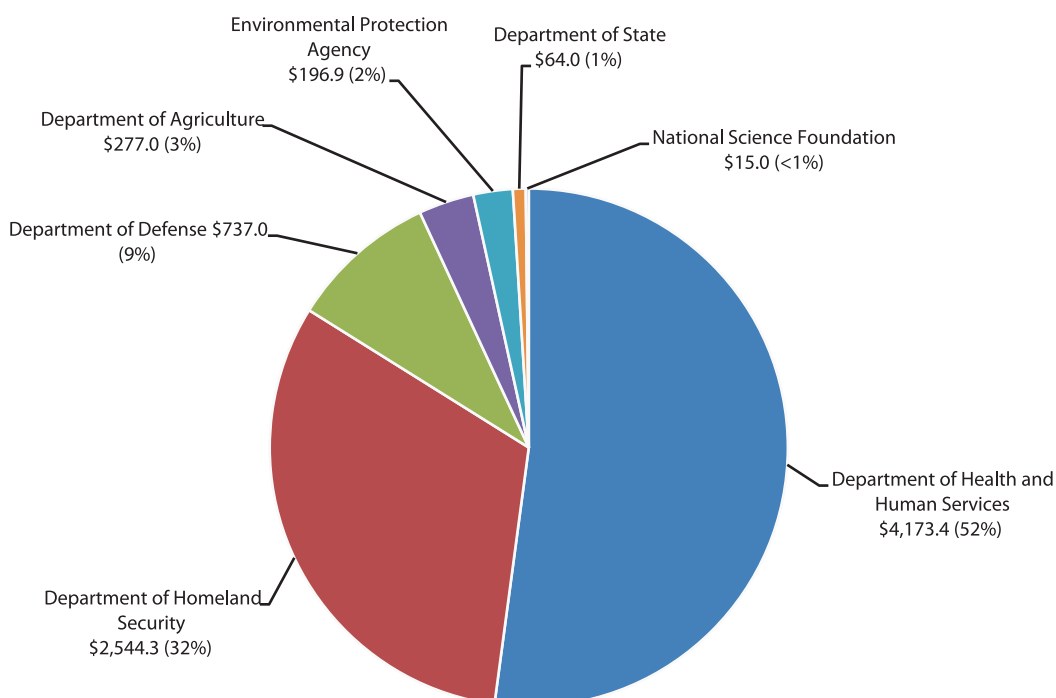


Figure 2. Civilian Biodefense Funding by Agency, FY2009 (in millions)

of State. Under the President's FY2009 budget, the only agency that would receive a decrease in funding is the National Science Foundation (NSF), which would eliminate or combine a number of its biodefense programs.

Biodefense has been a priority under the Bush administration as illustrated by the Homeland Security Presidential Directives (HSPD), which are both security-related and among the main foci of the President. A number of the HSPDs have direct significance for civilian biodefense, specifically HSPD-8 (National Preparedness, December 2003), HSPD-10 (Biodefense for the 21<sup>st</sup> Century, April 2004), and HSPD-18 (Medical Countermeasures against Weapons of Mass Destruction, January 2007).<sup>10</sup> Most recently, on October 18, 2007, the President released HSPD-21 (National Strategy for Public Health and Medical Preparedness), which emphasizes a "strategic vision that will enable a level of public health and medical preparedness" for threats such as a bioterrorist attack.<sup>11</sup>

Since the first "Billions for Biodefense" article, federal agencies have become somewhat more transparent in their accounting for, and analysis of, biodefense programs. HHS provides the most readable budget, with a section for preparedness and a subsection for biodefense funding. The USDA also provides a very good summary of food and agriculture defense. Other agencies such as DHS, EPA, and NSF provide fragmented budgets that require multiple personal contacts with the agency representatives to obtain otherwise unavailable data.

## METHODS AND SOURCES

The author used a variety of methods and sources to obtain and track civilian biodefense expenditures for FY2009, including agency "Budgets in Brief," stipulations included in public laws and accompanying Congressional reports, and personal contact with agency representatives. As in previous analyses, money spent on civilian biodefense in past fiscal years is referred to as "actual funds." For this article, numbers for actual funds are available from FY2001-FY2007. The author also identified funding appropriated by Congress for civilian biodefense during the current fiscal year (FY2008). While these funds have already been appropriated, it is unclear how much of that money will ultimately be spent on civilian biodefense activities for the year. Hence, FY2008 money is referred to as "estimated funds." Finally, the author analyzed the President's budget request for the upcoming 2009 fiscal year to gather data on proposed funding. These numbers are referred to as "budget" funds and are subject to change during the FY2009 Congressional budget and appropriations processes.

In order to obtain accurate and timely budget information for this analysis, a number of methods were used to acquire the data. Departmental "Budgets in Brief" documents

were primary resources. However, "Budgets in Brief" often contain only partial information on civilian biodefense programs and may not break funding down to the programmatic level. In cases where federal agencies or departments are made up of distinct operating divisions (eg, HHS and DoD), individual agency or division budgets were also examined. When these documents had been reviewed and still more detailed or complete information was needed, agency public affairs and budget offices were contacted by phone and email.

Inclusion of a line item in the budget for a biodefense program does not necessarily indicate the relative size or location of that program. A number of programs, such as BioShield, may be administered by one agency (HHS Office of the Assistant Secretary for Preparedness and Response [ASPR]) with guidance from another (DHS). Also, biodefense line items may represent programs with many components, such as the DHS Biological Countermeasures program.

As in previous years, every attempt has been made to distinguish items that should be considered for the purposes of this budget analysis as civilian versus military biodefense and/or other homeland security or public health-related programs. For the purposes of this analysis, civilian biodefense funding includes programs, research, or administrative costs that prevent or mitigate bioterrorism's effect on civilians. Some federal budgets for programs aimed at preventing and mitigating adverse civilian health effects (eg, HHS's BioShield) do not distinguish how much of the program is specifically targeted at biological agents, in addition to chemical, radiological, or nuclear threats. But as civilian biodefense is clearly a critical part of their mission, these programs have been included in their entirety as a practical measure. Multiple application programs (eg, HHS's Medical Reserve Corps or the National Disaster Medical System) that may provide a substantial benefit in responding to an incident of civilian bioterrorism have also been included in their entirety. This methodology has undoubtedly led to some overestimation of biodefense funding, because it is likely that some of those funds will be spent on nonbiodefense programs.

Examples of programs that have been excluded from civilian biodefense budget totals in this analysis are programs aimed explicitly at all-hazards preparedness (not bioterrorism preparedness specifically), at nonbioterrorism-related hazards such as pandemic flu, and those programs that have strictly military applications.

Of the DoD Chemical and Biological Defense program budget, only the Medical Biological Defense program, which is primarily focused on medical countermeasures, has been included in this analysis. The remainder of the Chemical and Biological Defense program is focused on military, rather than civilian, applications, including the purchase and maintenance of military-specific vehicles, de-

tectors, and protective gear that are not intended as tools for the U.S. civilian population. Additionally, a large proportion of the program is focused on chemical defense, which is not applicable to this analysis.

DoD's Medical Biological Defense program has the potential for civilian biodefense applications, has increasing coordination with other federal agencies, and has applicability to civilian biodefense in its biological medical countermeasures research and development activities. For these reasons the Medical Biological Defense Program has been included in DoD and overall biodefense budget totals both for FY2009 and retroactively for years prior.

Any items that could not be tracked in previous "Billions for Biodefense" articles were updated for this version as data became available. Some line items were also shifted when compared to previous articles to reflect the restructuring of various programs, agencies, and departments.

## CIVILIAN BIODEFENSE FUNDING BY FEDERAL AGENCY

### *Department of Health and Human Services*

For FY2009, the President has requested an increase of \$169.4 million, or 4.2%, over FY2008 estimated funding levels, for a total of \$4.17 billion for HHS civilian biodefense programs (Table 2). The majority of funds requested for FY2009 are allocated to programs within the U.S. Centers for Disease Control and Prevention (CDC) and the National Institute of Health (NIH) (Figure 3).

FY2009 proposed funding increases in the HHS budget include a \$46 million increase for CDC biosurveillance initiatives (BioSense, quarantine stations at ports of entry, and real-time laboratory reporting), an \$18 million increase in funds for the Strategic National Stockpile (SNS) to help support replacement of expiring stockpiled pharmaceuticals and offset the increased costs of stockpile warehousing, and a \$42 million increase to food defense initiatives under the Food and Drug Administration (FDA).<sup>12</sup>

The FY2009 budget proposes \$250 million for advanced research and development of medical countermeasures, a \$148 million increase over the estimated FY2008 level. Additionally, the FY2009 budget includes a new line item under ASPR for advanced development of next-generation ventilators. This item is budgeted at \$25 million.

The Biomedical Research and Development Authority (BARDA), under ASPR, is charged with supporting advanced research and development of new medical countermeasures (eg, medicines and vaccines) against biological threats. These proposed advanced research and development funds would "support research on selected countermeasure candidates with the greatest potential for purchase under Project BioShield and delivery to the Strategic National Stockpile (SNS)."<sup>12(p111)</sup> While the FY2009 budget proposes an increase in funding for BARDA initiatives related to advanced countermeasures research and development, Congress initially authorized \$1.07 billion in funding for BARDA for FY2006 to FY2008 under the Pandemic and All Hazards Preparedness Act of 2006 (PAHPA; P.L. 109-417).<sup>13</sup> An estimated \$260 million of this authorized amount has been spent through FY2008, with \$250 million budgeted for FY2009.

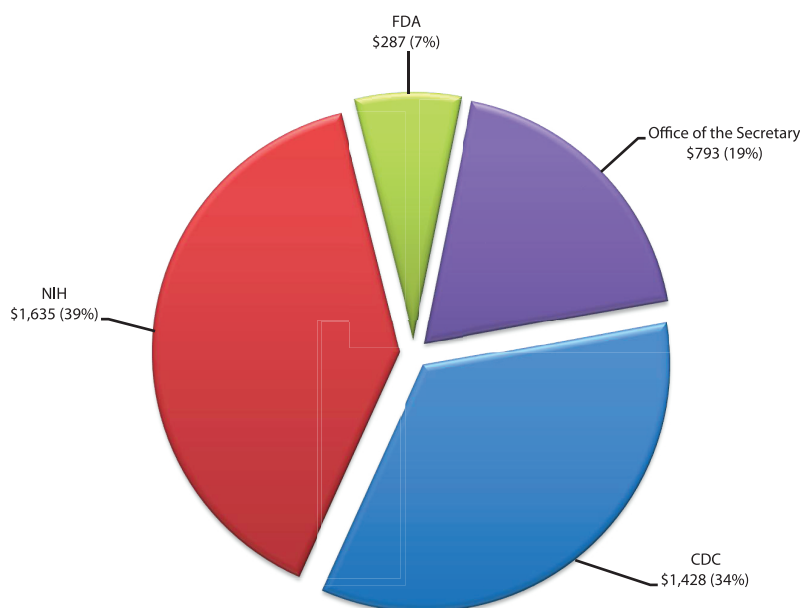


Figure 3. HHS Civilian Biodefense Funding, FY2009 (in millions)

Table 2. Department of Health and Human Services Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Totals
<b>Direct Appropriations to Agency Budgets (Non-PHSSEF)</b>										
<b>CDC</b>										
CDC: State and Local Capacity	67	940	939	918	919	823	767	746	599	6,718
Real Time Disease Detection Pilot Program	—	—	—	—	—	—	—	—	10	10
BioSurveillance Initiative										
BioSense	—	—	—	18	59	57	57	34	50	276
BioSense - Department of Defense Appropriation	—	—	—	0	0	35	0	0	0	35
Quarantine Stations (at ports of entry)	—	—	—	4	10	11	11	20	53	110
Quarantine Stations - Department of Defense Appropriation	—	—	—	0	0	20	0	0	0	20
Real Time Lab Reporting (Enhancing the Laboratory Response Network)	—	—	—	0	10	10	10	10	7	47
Subtotal, BioSurveillance Initiative <sup>a</sup>	—	—	—	22	79	133	78	64	110	487
Supplemental Appropriations (Smallpox)	—	—	100	0	0	0	0	0	0	100
Upgrading CDC Capacity	22	141	157	0	0	0	123	121	131	695
Anthrax Vaccine Research	18	18	18	0	0	0	12	8	8	82
Upgrading CDC Capacity/Anthrax Vaccine Research <sup>b</sup>	—	—	—	169	158	150	—	—	—	477
Botulinum Antitoxin Research	—	—	—	—	—	—	3	—	—	3
Independent Studies	11	2	2	0	0	0	0	0	0	15
Other	10	46	20	0	0	0	0	0	0	76
SNS <sup>c</sup>	81	1,157	398	398	467	474	496	552	570	4,593
Federal Mass Casualty Initiative (additional to the SNS)	—	—	—	—	—	50	0	0	0	50
<b>Subtotal, CDC</b>	209	2,304	1,634	1,507	1,623	1,630	1,476	1,491	1,428	13,303
<b>NIH</b>										
Biodefense Research (NIAID)	53	199	687	1,629	1,548	1,604	1,624	1,633	1,635	10,612
rPA Anthrax Vaccine Intermediate Scaleup	—	—	123	117	0	0	0	0	0	240
MVA Smallpox Vaccine Intermediate Scaleup	—	—	—	75	45	0	0	0	0	120
Extramural BT Research Facilities	—	92	495	119	149	30	14	0	0	899
<b>Subtotal, NIH</b>	53	291	1,305	1,940	1,742	1,634	1,638	1,633	1,635	11,871
<b>FDA</b>										
Food Defense (formerly labeled "Food Safety")	1	98	97	116	150	158	172	171	213	1,176
Medical Product Countermeasures (formerly labeled "Vaccines/Drugs/Diagnostics")	6	46	53	53	57	57	57	56	67	452
Physical Security	2	13	7	7	7	7	7	7	7	64
<b>Subtotal, FDA</b>	9	157	157	176	214	222	236	234	287	1,692





According to estimates from the Center for Biosecurity, \$817 million would be required for FY2009 to support 1 full year of advanced countermeasures development, and a sum of \$3.39 billion would be required to support a medical countermeasures pipeline that would provide a 90% chance of developing medical countermeasures to fulfill the requirements of HHS's Public Health Emergency Countermeasures Enterprise (PHEMCE) Implementation Plan.<sup>14</sup>

For FY2009, the President has proposed a \$62 million cut to the Hospital Preparedness Program grants under ASPR. This program provides grant funding and guidance to states and localities to increase hospital and healthcare preparedness for bioterrorism and other public health emergencies. Similarly, the FY2009 budget proposes a \$137 million cut to the CDC State and Local Capacity program, composed primarily of the CDC public health grants, which help increase preparedness of state and local public health departments. In its FY2009 "Budget in Brief," HHS describes the proposed decreases to these grant programs as an implementation of a "shortened grant period to start the grant period in future fiscal years on June 1."<sup>12(p111)</sup> This shortened FY2009 grant period is intended to align these grants with many state budget cycles and other federal grant programs for future years.

NIH remains the lead recipient of HHS biodefense funds, with an FY2009 budget of \$1.64 billion (Table 2). The entirety of NIH biodefense funds is directed to the National Institute of Allergy and Infectious Diseases (NIAID) for its biodefense research initiatives, which include re-

search into pathogens and their interaction with human and animal hosts, as well as clinical evaluation of vaccines and drugs against biological agents.

### *Department of Homeland Security*

The DHS budget request for FY2009 totals \$2.54 billion, an increase of \$2.19 billion over FY2008 estimated levels. This large increase in civilian biodefense funding for DHS is due to the scheduled allocation of Project BioShield money from its special reserve fund. Under the DHS Appropriations Act of 2004,<sup>15</sup> BioShield received appropriations in the amount of \$5.6 billion. Of that amount, \$885 million and \$2.507 billion were allocated in FY2004 and FY2005, respectively, for use in FY2004 to FY2008. The remainder of the appropriations (\$2.175 billion) will be allocated to BioShield in FY2009 for use in FY2009 to FY2013 (Table 3).<sup>16</sup>

Project BioShield, while funded through DHS, is managed jointly by DHS and HHS. The role of DHS has been to "identify and prioritize" threats via Material Threat Determinations (MTDs) and Population Threat Assessments (PTAs) for biological agents. The results of these MTDs and PTAs have been presented to HHS, to "inform medical and public health consequence assessments" and to "guide" priorities for research, development, and acquisition of medical countermeasures.<sup>16(p96)</sup>

The President's FY2009 budget request eliminates funding for the Metropolitan Medical Response System

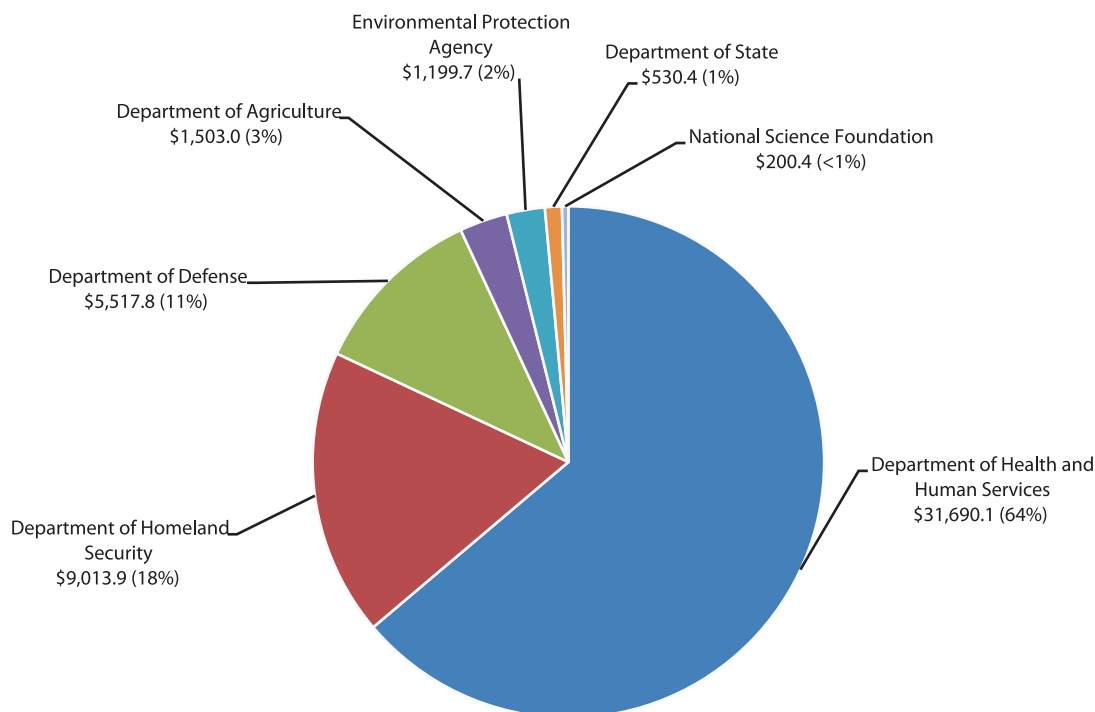


Figure 4. Cumulative Civilian Biodefense Funding by Agency, FY2001-FY2009 (in millions)



Table 3. Department of Homeland Security Civilian Biodefense Funding, FY2003-FY2009 (in \$millions)

	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
<b>National Protection and Program Directorate<sup>a</sup></b>								
National Disaster Medical System <sup>b</sup>	5	82	34	134	—	—	—	255.0
Strategic National Stockpile	0	398	0	— <sup>c</sup>	—	—	—	398.0
MMRS	50	50	30	30	33	41	0	2'34.0
<b>Office of Health Affairs</b>								
BioShield <sup>d</sup>	0	885	2,507	0 <sup>e</sup>	0 <sup>e</sup>	0 <sup>e</sup>	2,175	5,567.0
BioSurveillance (National Biosurveillance Integration Center and other initiatives)	0	0	12.5	14.1	7.3	8	8	49.9
BioWatch <sup>f,g</sup>	—	—	—	—	85.1	77.1	111.6	273.8
Planning and Coordination	—	—	—	—	—	—	—	—
Animal Disease and AgroDefense	—	—	—	—	—	0.8	0.7	1.5
Medical Readiness	—	—	—	—	—	3.7	7.2	10.9
National Biodefense Architecture	—	—	—	—	—	—	2.0	2.0
<b>Science &amp; Technology Directorate</b>								
Biological Countermeasures (includes HSARPA, National Bio and Agrodefense Facility, BioWatch R&D, bioforensics, and other research efforts)	362	285	362.7	376.2	228.4	154.8	140.6	1,909.7
Laboratory Facilities <sup>h</sup>	—	—	—	—	—	—	—	—
Laboratory Operations	—	—	—	—	—	27	30.7	57.7
Plum Island Animal Disease Center	—	—	—	—	—	16.8	32.9	49.7
National Biodefense Analysis and Countermeasures Center (NBACC)	—	—	—	—	—	—	—	—
Laboratory Construction	—	—	—	—	—	17.3	0	17.3
Plum Island Animal Disease Center	5.0	88.0	35	13	0	11	35.6	187.6
NBACC	—	—	—	—	—	—	—	—
<b>Total DHS Civilian Biodefense Funding</b>	<b>422.0</b>	<b>1,788.0</b>	<b>2,981.0</b>	<b>567.3</b>	<b>353.8</b>	<b>357.5</b>	<b>2,544.3</b>	<b>9,013.9</b>

<sup>a</sup>Formerly the Preparedness Directorate (P.L. 109-295 and changes pursuant to section 872 of the Homeland Security Act, 2002).

<sup>b</sup>NDMS was transferred to the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR) effective January 1, 2007.

<sup>c</sup>The Strategic National Stockpile was transferred to HHS (CDC).

<sup>d</sup>Of the \$5.6 billion BioShield special reserve fund (appropriated in FY2004), an amount not to exceed \$3.4 billion was allotted for FY2004-FY2008 for the program. The remaining approximately \$2.2 billion of the fund has been allocated in the FY2009 budget for FY2009-FY2013.

<sup>e</sup>Funds appropriated for BioShield in years prior will be used in the current year.

<sup>f</sup>BioWatch was formerly located within the Science and Technology Directorate and had been part of the Biological Countermeasures line item through FY2006 (P.L. 109-295 and changes pursuant to section 872 of the Homeland Security Act, 2002).

<sup>g</sup>The FY2007 number for BioWatch is an estimate only. DHS could not confirm the validity of this number.

<sup>h</sup>The FY2009 DHS budget breaks down the Laboratory Facilities line item into operations and construction for various facilities for the first time. Attempts were made to obtain numbers for previous fiscal years. NBACC operations began in 2008 (therefore, prior numbers are not available), and numbers for Plum Island Construction and Operations prior to FY2008 were not provided by DHS.

Sources: DHS FY2009 Budget in Brief [http://www.dhs.gov/xlibrary/assets/budget\\_bib-fy-2009.pdf](http://www.dhs.gov/xlibrary/assets/budget_bib-fy-2009.pdf); DHS FY2009 Budget Details [http://www.dhs.gov/xlibrary/assets/budget\\_fy2009.pdf](http://www.dhs.gov/xlibrary/assets/budget_fy2009.pdf); DHS Press Office; DHS Program Officials; OMB Press Office; DHS FY2008 Budget in Brief [http://www.dhs.gov/xlibrary/assets/budget\\_bib-fy-2008.pdf](http://www.dhs.gov/xlibrary/assets/budget_bib-fy-2008.pdf).

(MMRS). Similarly, the FY2008, FY2007, FY2006, and FY2005 presidential budgets also eliminated funding for the program.<sup>7-9</sup> However, Congress has continued to fund MMRS each year in their appropriations. FY2008 estimates for MMRS show an \$8 million increase in funding, for a total of \$41 million.

The requested budget for the BioWatch program, in the Office of Health Affairs, is \$111.6 million, an increase of \$34.5 million. The increased funding is proposed for procurement of “next generation” BioWatch systems with automated agent detection sensors to “enhance BioWatch environmental monitoring capabilities.”<sup>16(p11)</sup> Also under the Office of Health Affairs is a new request for funding of \$2 million for the National Biodefense Architecture, an initiative to define “common elements, framework, and connectivity necessary for the integrated biodefense system” called for in HSPD-10 (Biodefense for the 21<sup>st</sup> Century).<sup>16(p98)</sup>

Under the DHS Science and Technology Directorate, FY2009 funding for the National Biodefense Analysis and Countermeasures Center (NBACC) is budgeted as part of the laboratory facilities program, along with the Plum Island Animal Disease Center. Funding for these facilities has been broken down by construction and operations costs for the first time. Because these are new categories of funds, numbers are not available for years prior to FY2008.

### *Department of Defense*

The FY2009 presidential budget requests an increase of \$115.5 million in funding for DoD civilian biodefense activities over FY2008 estimated appropriations. DoD biodefense activities included in this FY2009 budget analysis include: Biological Threat Reduction in the Former Soviet Union; Army National Guard Domestic Preparedness for Weapons of Mass Destruction (including WMD Civil Support Teams); the Biological Warfare Defense Program, located in the Defense Advanced Research Projects Agency (DARPA); and the Medical Biological Defense programs under the Chemical and Biological Defense heading.

Of the DoD Chemical and Biological Defense program budget, only the Medical Biological Defense program, which is primarily focused on medical countermeasures, has been included in this analysis. The remainder of the Chemical and Biological Defense program is focused on military, rather than civilian, applications including the purchase and maintenance of military-specific vehicles, detectors, and protective gear that are not intended as tools for the U.S. civilian population. Additionally, a large proportion of the program is focused on chemical defense, which is not applicable to this analysis (Table 4).

Both the Army National Guard Domestic Preparedness Program and the Biological Warfare Defense Program face proposed budget cuts in FY2009. The Army National Guard Program would be cut by \$10.9 million, and

DARPA Biological Warfare Defense would be reduced by \$5.8 million. In contrast, the Biological Threat Reduction program is proposed to receive an increase of \$25.9 million over FY2008 appropriations. This program oversees the location, collection, and destruction of residual “dangerous pathogens” from weapons created under the former Soviet Union’s biological weapons program. Additionally, the DoD Biological Threat Reduction program seeks to engage scientists from the former Soviet Union in open and ethical research and prevent them from being sought out and employed by terrorist groups and “rogue states” that might intend to create and use biological weapons.<sup>17</sup>

As stated in the methods section, the Medical Biological Defense program has been included in this year’s analysis because of its potential for civilian biodefense applications, increased coordination of DoD with other federal agencies, and the program’s applicability to civilian biodefense in its biological medical countermeasures research and development activities. For these reasons the Medical Biological Defense program has been included in DoD and overall biodefense budget totals both for FY2009 and retroactively for years prior (Table 4).

The Medical Biological Defense program represents a majority of DoD’s investment in biodefense activities, includes funding for basic and applied biological research, and encompasses specific research areas such as the Transformational Medical Technologies Initiative (TMTI), launched in FY2006 “as a key Quadrennial Defense Review initiative to respond to the threat of emerging or intentionally bioengineered biological threats.”<sup>17(pp57-58)</sup> For FY2009, Medical Biological Defense is proposed to receive \$413.1 million, an increase of \$106.3 million over FY2008 estimates. Since FY2001, this program has reached a total of \$2.22 billion in funding (including estimates for FY2009).

### *Department of Agriculture*

The FY2009 presidential budget requests an increase in civilian biodefense funding for the USDA of \$91 million, or 49%, over the FY2008 funding levels, for a total of \$277 million (Table 5).

This proposed rise in USDA funding is due to increases in program funding for both of USDA’s biodefense initiatives, food defense and agricultural defense. Within the food defense initiative, the Agricultural Research Service (ARS) Food Defense Research is to receive a boost in funding from an estimated \$9 million in FY2008 to \$23 million in FY2009. This money supports research into man-made and natural sources of food supply contamination, as well as surveillance and detection intervention systems.<sup>18(pp13,84)</sup>

The proposed increase in FY2009 Agricultural Defense Initiative funding is primarily attributable to rises in funding for Agricultural Defense Research and Enhanced Surveillance. According to FY2008 USDA budget documents,

*(continued on page 145)*

Table 4. Department of Defense Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
Biological Countermeasures	0	400	0	0	0	—	—	—	—	400.0
WMD Civil Support Teams	123	109	107	207	195	56.4	—	—	—	797.4
Army National Guard Domestic Preparedness Weapons of Mass Destruction (including WMD Civil Support Teams)	—	—	—	—	—	—	91.6	84.1	73.2	248.9
Biological Threat Reduction (in Former Soviet Union)	12	17	55	67.8	68.7	69.8	72.3	158.5	184.4	705.5
Biological Warfare Defense Program (located in DARPA)	146.2	171.9	157.9	141.9	155.4	132.8	99.9	72.1	66.3	1,144.4
Chemical and Biological Defense Program										
Medical Biological Defense <sup>a</sup>										
Basic Research	20.0	23.6	30.7	27.1	32.3	53.8	66.1	35.0	16.4	304.9
Applied Research	22.4	34.2	47.2	44.8	43.0	89.2	93.5	100.9	54.7	529.9
Advanced Technology Development	22.4	34.6	34.7	44.4	67.9	87.9	87.1	95.5	252.3	726.8
Advanced Component Development and Prototypes	28.5	68.6	36.1	66.5	24.2	26.3	25.8	1.6	0.0	277.6
System Development and Demonstration	15.8	45.0	34.8	7.1	9.8	50.0	56.3	73.8	89.7	382.3
Subtotal, Medical Biological Defense	109.1	206.0	183.5	189.9	177.2	307.2	328.8	306.8	413.1	2,221.5
<b>Total DoD Civilian Biodefense Funding</b>	<b>390.3</b>	<b>903.9</b>	<b>503.4</b>	<b>606.6</b>	<b>596.3</b>	<b>566.2</b>	<b>592.6</b>	<b>621.5</b>	<b>737.0</b>	<b>5,517.8</b>

<sup>a</sup>In the Chemical and Biological Defense Program, only Medical Biological Defense has been included in totals for FY2009 and years past. Medical Biological Defense is primarily countermeasures-research oriented, whereas the remainder of the Chemical and Biological Defense Program is either focused on chemical defense or has strictly military applications.

Sources: DoD FY2009 Operations and Maintenance Overview [http://www.defenselink.mil/comptroller/debudget/fy2009/fy2009\\_overview.pdf](http://www.defenselink.mil/comptroller/debudget/fy2009/fy2009_overview.pdf), Pg. 56; FY2009 Department of the Army Budget Estimates <http://www.asafm.army.mil/budget/fybm/fy09/omng-v1.pdf>, Pg. 145; DoD FY2009 Chemical and Biological Defense Program Budget Justification [http://www.defenselink.mil/comptroller/debudget/fy2009/budget\\_justification/pdfs/03\\_RDT\\_and\\_EVOL\\_4\\_CBDP/CBDP%20PB09%20RDT%20TE.pdf](http://www.defenselink.mil/comptroller/debudget/fy2009/budget_justification/pdfs/03_RDT_and_EVOL_4_CBDP/CBDP%20PB09%20RDT%20TE.pdf); DoD Budget Justifications FY2003-FY2009 [http://www.defenselink.mil/comptroller/debudget/fy2009/budget\\_justification/index.html](http://www.defenselink.mil/comptroller/debudget/fy2009/budget_justification/index.html).

Table 5. Department of Agriculture Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001 <sup>a</sup>	FY2002 <sup>a</sup>	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
<b>Food and Agricultural Defense Initiative</b>										
<b>Food Defense</b>										
FSIS	—	—	1	1	3	3	3	3	3	17
Surveillance/Monitoring	—	—	0	0	3	2	4	14	14	37
Food Emergency Response Network (FERN)	—	—	0	2	2	2	2	2	2	12
Enhanced Inspections	—	—	1	3	3	3	3	6	6	25
Lab Upgrades/Physical Security	—	—	2	2	3	2	3	2	2	16
Education/Training	—	—	4	4	5	5	5	5	5	33
Other	—	—	2	2	8	9	9	9	23	62
ARS Food Defense Research	—	—	10	14	27	26	29	41	55	202
<b>Subtotal, Food Defense</b>	—	—								
<b>Agricultural Defense</b>										
ARS	—	—	143	0	121	58	0	0	0	322
Ames, IA, BSL-3 Facility	—	—	10	17	21	25	25	25	39	162
Research	—	—	0	0	2	2	2	2	2	10
National Plant Disease Recovery System										
Cooperative State Research, Education, and Extension										
Services (CSREES)										
Regional Diagnostic Network	—	—	0	8	9	10	10	10	14	61
Higher Education Agrosecurity Program	—	—	0	0	0	0	0	0	2	2
APHIS Pest Detection/Animal Health Monitoring										
Enhanced Surveillance	—	—	0	38	80	87	82	63	98	448
BioSurveillance	—	—	0	0	2	2	2	2	3	11
Plant Safeguarding Activities	—	—	—	17	17	17	16	18	19	104
Select Agents—Plants and Animals	—	—	0	0	3	3	3	4	6	19
National Veterinary Stockpile	—	—	0	1	3	3	3	4	8	22
Others	—	—	37	14	13	14	14	14	18	124
<b>Subtotal, Agricultural Defense</b>	—	—	190	95	271	221	157	142	209	1,285
Athens, GA, Biocontainment Lab/Poultry Research Facility	—	—	0	0	0	0	0	3	13	16
<b>Total USDA Civilian Biodefense Funding</b>	—	—	<b>200</b>	<b>109</b>	<b>298</b>	<b>247</b>	<b>186</b>	<b>186</b>	<b>277</b>	<b>1,503</b>

<sup>a</sup>USDA Press and Budget offices were unable to provide numbers for these years.Sources: USDA FY2009 Budget Summary and Annual Performance Plan <http://www.obpa.usda.gov/budsum/fy09budsum.pdf>, Pg. 13-14.

Table 6. Environmental Protection Agency Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
Capitol Hill Anthrax Cleanup	20	—	—	—	—	—	—	—	—	20.0
Homeland Security										
Clean and Safe Water <sup>a</sup>	0	3.8	—	—	—	—	—	—	—	3.8
Waste Management <sup>b</sup>	0	3.2	—	—	—	—	—	—	—	3.2
Quality Environmental Information <sup>b</sup>	0	0.6	—	—	—	—	—	—	—	0.6
Sound Science/Improved Understanding/Innovation <sup>b</sup>	0	0.6	—	—	—	—	—	—	—	0.6
Deterrent to Pollution <sup>b</sup>	0	3.5	—	—	—	—	—	—	—	3.5
Emergency Supplemental Funds <sup>c</sup>	0	175.6	0	0	0	—	—	—	—	175.6
Clean and Safe Water: Homeland Security, Critical Infrastructure Protection, Protect Human Health	0	0	14.2	27.4	—	—	—	—	—	41.6
Clean Land: Homeland Security Preparedness, Response and Security	0	0	37.6	27.3	—	—	—	—	—	64.9
Healthy Communities & EcoSystems										
Homeland Security Prep/Resp/Sec, Chem/Org/Pesticide Risks	0	0	0.7	2.3	—	—	—	—	—	3.0
Homeland Security Prep/Resp/Sec, Science and Research	0	0	31	29	—	—	—	—	—	60.0
Compliance and Environmental Stewardship: Homeland Security:										
Critical Infrastructure Protection, Improve Compliance	0	0	4.2	3.9	—	—	—	—	—	8.1
Enabling and Support Programs, Homeland Security										
Office of Waste and Emergency Response	0	0	0	0.6	—	—	—	—	—	0.6
Office of Administration and Resources Management, Protection of EPA Personnel and Infrastructure	0	0	40	19.3	—	—	—	—	—	59.3
Office of Environmental Information, Communication and Information	0	0	0	3.8	—	—	—	—	—	3.8
Office of the Administrator, Communication and Information	0	0	0.9	0	—	—	—	—	—	0.9
Homeland Security										
Grants to States (formerly Water Safety Grants)	0	0	4.5	5.0	5.0	5.0	5.0	4.9	5.0	34.3
Communication and Information	—	—	—	—	4.3	6.8	6.8	—	—	17.9
Critical Infrastructure Protection	—	—	—	—	11.2	20.6	30.5	—	—	62.3
Preparedness, Response and Recovery	—	—	—	—	56.4	76.6	90.6	—	—	223.6
Protection of EPA Personnel and Infrastructure	—	—	—	—	20.5	20.2	20.3	—	—	61.0
Homeland Security										
Science and Technology (including the water sentinel program)	—	—	—	—	—	—	—	54.1	73.9	128.0
Environmental Program and Management (including laboratory decon, and lab preparedness and response)	—	—	—	—	—	—	—	24.1	23.5	47.6
Buildings and Facilities	—	—	—	—	—	—	—	34.3	35	69.3
Hazardous Substance Superfund (including laboratory decon, and lab preparedness and response)	—	—	—	—	—	—	—	47.0	59.5	106.5
<b>Total EPA Civilian Biodefense Funding</b>	<b>20.0</b>	<b>187.2</b>	<b>132.9</b>	<b>118.7</b>	<b>97.4</b>	<b>129.1</b>	<b>153.1</b>	<b>164.4</b>	<b>196.9</b>	<b>1,199.7</b>

<sup>a</sup>Numbers for additional years are included in other line items, such as Clean Land.

<sup>b</sup>Due to EPA reorganization, these activities fell under new headings beginning in FY2003.

<sup>c</sup>This bill includes a number of relevant line items, but a precise breakdown which accounts for all \$175 million could not be found.

Sources: EPA Budget in Brief FY2009 <http://www.epa.gov/ocfo/budget/2009/2009bib.pdf>. Pg. 63–79; EPA FY2007 Appropriations Analysis Book. [http://www.epa.gov/ocfo/budget/analysis\\_book/2007/fy2007\\_analysis\\_book.pdf](http://www.epa.gov/ocfo/budget/analysis_book/2007/fy2007_analysis_book.pdf).

Table 7. Department of State Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
Worldwide Security Upgrades: Chem/Bio Program	3.8	3.9	15.2	17.1	17.1	19	10.8	— <sup>a</sup>	— <sup>a</sup>	86.9
BioRedirection <sup>b</sup>	0	67	52.0	50	—	—	—	—	—	169.0
Global Threat Reduction Program <sup>c</sup>	—	—	—	—	50.1	52.1	51.4	56.9	64.0	274.5
<b>Total State Department Civilian Biodefense Funding</b>	<b>3.8</b>	<b>70.9</b>	<b>67.2</b>	<b>67.1</b>	<b>67.2</b>	<b>71.1</b>	<b>62.2</b>	<b>56.9</b>	<b>64.0</b>	<b>530.4</b>

<sup>a</sup>The Chem/Bio Worldwide Security Upgrades line item was folded into the Physical Security/Protective Equipment Worldwide Security Upgrades. Therefore, specific numbers for Chem/Bio are not available.

<sup>b</sup>The BioRedirection program was included under the Nonproliferation of WMD Expertise item in 2005.

<sup>c</sup>Nonproliferation of WMD Expertise was renamed the Global Threat Reduction Program beginning in FY2008.

Sources: U.S. Department of State Budget in Brief FY2009 <http://www.state.gov/s/d/rm/rts/bib/2009/>; Summary and Highlights, International Affairs Function 150 FY2009 Budget Request <http://www.state.gov/documents/organization/101427.pdf>.

Table 8. National Science Foundation Civilian Biodefense Funding, FY2001-FY2009 (in \$millions)

	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007 (actual)	FY2008 (estimate)	FY2009 (budget)	Total
Homeland Security Activities: Research to Combat Bioterrorism	0	4.1	6	6	6	6	6	6	—	40.1
Ecology of Infectious Diseases, BIO Directorate	0	0	4	4	4	4	4	4	—	24.0
Ecology of Infectious Diseases, GEO Directorate	0	4.8	15	15	15	15	15	15	15	109.8
Microbial Genome Sequencing, BIO Directorate	0	0	2	2	2	2	1.9	—	—	9.9
Microbial Genome Sequencing, Formerly CISE	0	0	4.3	4	4	4.3	—	—	—	16.5
Sensors and Sensor Networks, Engineering Directorate	0.0	9.0	31.3	31.0	31.0	31.3	26.9	25.0	15.0	200.4
<b>Total NSF Civilian Biodefense Funding</b>	<b>0.0</b>	<b>9.0</b>	<b>31.3</b>	<b>31.0</b>	<b>31.0</b>	<b>31.3</b>	<b>26.9</b>	<b>25.0</b>	<b>15.0</b>	<b>200.4</b>

Sources: NSF FY2008 Budget in Brief; [http://www.nsf.gov/about/budget/fy2008/pdf/11\\_fy2008.pdf](http://www.nsf.gov/about/budget/fy2008/pdf/11_fy2008.pdf); NSF Homeland Security Activities Summary FY2009 Budget Request to Congress [http://www.nsf.gov/about/budget/fy2009/pdf/10\\_fy2009.pdf](http://www.nsf.gov/about/budget/fy2009/pdf/10_fy2009.pdf).



these programs have been put in place in order to identify, detect, and track threats to the U.S. agricultural infrastructure.<sup>18(p74)</sup> Agriculture defense funding is projected to increase overall by 47% over FY2008 levels.

### *Environmental Protection Agency*

For FY2009, the budget for EPA requests \$196.9 million for civilian biodefense programs, an increase of \$32.5 million (19.7%) over FY2008 estimated funds. The agency has again renamed its homeland security initiatives, but has maintained the same basic organization and programs under each homeland security heading (Table 6).<sup>19</sup>

### *Department of State*

For FY2009, the President's budget requests an increase in funding for the State Department's civilian biodefense programs of \$7.1 million, for a total of \$64 million. Because other programs have been reprogrammed or discontinued, the only State Department funding counted in this analysis is the Global Threat Reduction Program (formerly Non-proliferation of WMD Expertise). This program includes the Bio-Chem Redirection program, which "engages former Soviet biological and chemical weapons scientists in . . . civilian research projects" with the U.S.,<sup>20</sup> and the BioIndustry Initiative, which works to transform "former Soviet biological weapons production facilities . . . for peaceful uses"<sup>21</sup> (Table 7).<sup>22</sup>

### *National Science Foundation*

The President's FY2008 budget for the NSF proposes a cut of \$10 million, or 60%, over estimated FY2008 funds, for a total of \$15 million for civilian biodefense. The FY2008 funding decrease is due to the elimination of the Ecology of Infectious Diseases programs in both the biology and geology directorates. Within the President's FY2009 budget, biodefense funding is solely directed toward microbial genome sequencing within the biology directorate (Table 8).<sup>23</sup>

## CONCLUSION

The President's proposed FY2009 budget requests \$8.01 billion for civilian biodefense, an increase of \$2.59 billion above the FY2008 estimate, most of which is due to the allocation of \$2.175 billion in BioShield funds from a Special Reserve Fund. Excluding BioShield, biodefense funding for FY2009 is proposed to rise \$311 million above the previous year's appropriations. Overall, federal civilian biodefense funding now totals approximately \$49.66 billion from FY2001 to FY2009.

As in previous "Billions for Biodefense" analyses, HHS continues to command the majority of federal biodefense funding (52%), followed by DHS with 32%, DoD with 9%, and USDA at 3% of FY2009 funding. Six of the 7

agencies included in this budget analysis would receive increases to their biodefense budgets, with only the NSF receiving a cut in funding. While advanced research and development of countermeasures under BARDA (HHS) is budgeted for an increase in FY2009, it does not approach the amount of funding originally authorized under PAHPA (P.L. 109-407) or the amount of money needed to achieve the medical countermeasures requirements set by HHS under its PHEMCE implementation plan. Substantial programmatic budget decreases to the ASPR Hospital Preparedness Program grants and CDC's Upgrading State and Local Capacity public health preparedness grants are significant, but are intended to better align the grants with state funding cycles.

Seven budget years and almost \$50 billion after September 11 and the anthrax attacks of 2001, the number, scope, and funding of civilian biodefense programs within the federal government have increased. However, as this analysis illustrates, there remains a lack of a centralized organizing federal authority for biodefense programs, and there is an ongoing need for a better mechanism to track civilian biodefense funding within and across agencies.

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