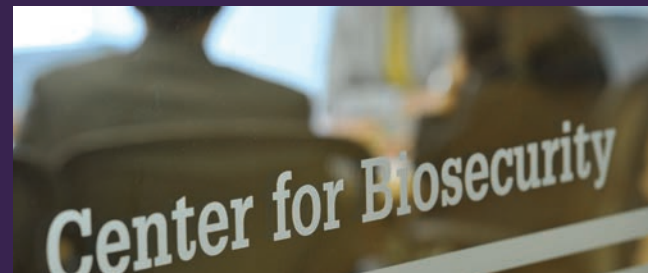


# Center for Biosecurity of UPMC

ANNUAL REPORT 2010-2011



Mission



## SUPPORT

The Center's work would not have been possible without the leadership and generosity of UPMC.


UPMC's commitment to the Center has allowed us to be independent, innovative, and able to meet new and unexpected challenges with strength and expertise. We are deeply grateful for that support.

## *Our Mission*

The Center for Biosecurity is an independent nonprofit organization of UPMC. Our mission is to strengthen U.S. national security and resilience by reducing dangers posed by epidemics, biothreats, nuclear disasters, and other destabilizing events.

Our staff comprises experts in medicine, public health, national security, law, economics, the biological and social sciences, and global health.

We conduct original research and policy analysis, convene experts to solve difficult problems, and inform and engage national leaders.



*“The entire UPMC conference series on advancing policy and practice [is] a call to action—a call to address the gaps in our preparedness now and to make more effective use of the resources we have in our communities and at all levels of government.”*

Brian Kamoie, Senior Director for Preparedness Policy,  
National Security Staff of The White House. Conference on  
Advancing U.S. Resilience to a Nuclear Catastrophe. May 19, 2011



# Contents

Letter from the Director	4
Staff	7
The Center's Work	10
Strengthening Global Health and Security	11
Improving Response to Biological Threats	25
Preparing for Nuclear and Radiological Disaster	41
Raising Awareness and Readiness	51
Building the Professional Community and Scholarship	58
More than a Decade of Leadership and Scholarship	63
Center Leadership	64
Center Staff	68



## Keeping Pace with Evolving Threats

In February 2011, the Director of National Intelligence stated that “The threat and destabilizing effect of nuclear proliferation, as well as the threat from the proliferation of materials and technologies that could contribute to existing and prospective chemical and biological weapons programs, are among our top concerns.” In May 2011, after announcing the death of Osama bin Laden, President Obama reminded the nation that “there’s no doubt that al Qaeda will continue to pursue attacks against us.” Without question, biological and nuclear threats persist and, along with the threats of natural disasters and pandemics, may even increase over time.

So, too, will the need for effective response. At the Center for Biosecurity, we pride ourselves on being a responsible and steadfast voice for strengthening the nation’s planning, response, and resilience in the face of such extraordinary challenges. Our independent research, analysis, and non-partisan policy recommendations are important resources for the many leaders and policymakers responsible for national security and managing U.S. response to catastrophic events.

As we’ve worked to address biological and nuclear threats over time, we have seen the traditional lines between many disciplines blur and even disappear. This is true, for instance, with regard to perceptions of disease outbreaks

outside of the U.S. Once considered purely public health problems, disease outbreaks are now recognized as potential threats to national and international security. In a similar vein, advancements in the life sciences are now seen as important not only to human health and agriculture, but also to national security. And preparations for nuclear catastrophes and natural disasters are increasingly informed by work done in the realms of biosecurity and biodefense.

This intersecting of disciplines requires a merging of professional domains, fresh and unconventional approaches, and a combination of skill sets. That type of approach has long characterized the Center’s work and fueled our substantial contributions to scholarship, policy, and practice.

In this past year, our contributions included the conference *Preserving National Security: The Growing Role of the Life Sciences*, which we convened in recognition of the government’s interest in understanding life science trends and developments that could pose new threats or foster innovations in national security. Our meeting was designed to bridge gaps among science, security, and public policy. We also applied our understanding of the relationships among global security, U.S. national security, and international disease surveillance to frame a strategic approach to U.S. investments in diagnostics.

And our conference *Improving Global Health, Strengthening Global Security* provided a national forum for exploring issues in international disease detection and response, such as the challenges associated with the Biological Weapons Convention and policy tensions between national security and public health.

We are also making strides in applying lessons learned in biosecurity to planning for nuclear catastrophes. While we strongly support the nuclear nonproliferation agenda, we also recognize a comparative lack of planning for a possible terrorist nuclear detonation. Therefore, we initiated a major endeavor called the *Rad Resilient City Project* to provide high terrorism-risk cities with a cogent checklist of actions to drastically reduce casualties from fallout after a nuclear detonation. In the year ahead, we will devote significant effort and resources to encouraging city leaders, first responders, and community organizers to engage and inform the public about these protective actions. On a related front, the Center's physicians have proposed a new approach to lab screening to greatly accelerate the government's ability to conduct mass triage of people exposed to radiation following a nuclear catastrophe.

Our commitment to innovation extends to response to infectious disease threats. We are now developing a cost calculator that will gauge the country-by-country economic burden of emerging infectious diseases and allow policymakers worldwide to compare the costs of disease control measures with the costs of ongoing transmission. We have also posited a new model for understanding transmission of dengue virus, which is threatening billions of people around the globe, and we are assessing the potential utility of prediction markets as tools for faster anticipation of emerging infectious diseases.

In all, the Center's success is attributable to its strong, experienced, and creative team of experts. I appreciate daily their array of skills and the perspectives that they bring to bear on our work in these evolving fields.

I am also deeply appreciative of the generosity of UPMC and the Alfred P. Sloan Foundation, and of the strong personal commitment of Jeffrey Romoff, CEO of UPMC, who makes all of our work possible.

A handwritten signature in black ink, appearing to read 'Tom Inglesby', with a large, stylized initial 'T'.

Thomas V. Inglesby, MD  
CEO and Director







# STAFF OF THE CENTER FOR BIOSECURITY

The Center's success depends entirely on the many talented professionals who are dedicated to advancing our mission with their work throughout the year.

## Executive Officers

Thomas V. Inglesby, MD, Director  
and Chief Executive Officer

Anita Cicero, JD, Deputy Director  
and Chief Operating Officer

## Senior Associates & Associates

Amesh Adalja, MD, Associate

Crystal Franco, MPH, Associate

Gigi Kwik Gronvall, PhD, Senior Associate

Ann Norwood, MD, COL, USA, MC (Ret),  
Senior Associate

Jennifer Nuzzo, SM, Senior Associate

Monica Schoch-Spana, PhD, Senior Associate

Eric Toner, MD, Senior Associate

## Senior Analysts & Analysts

Nidhi Bouri, Senior Analyst

Kunal Rambhia, MS, Senior Analyst

Tara Kirk Sell, MA, Analyst

Matthew Watson, Analyst

Samuel Wollner, Analyst

## Distinguished Scholar

D. A. Henderson, MD, MPH

## Contributing Scholars

Joseph E. Fitzgerald, MS, MPH

Dan Hanfling, MD

Fred Selck, MA

Richard E. Waldhorn, MD

## Administrative Officers

Bruce Campbell, Chief Financial Officer  
and Senior Administrator

Mary Beth Hansen, MA, Chief Information  
and Administrative Officer

## Publications, Communications & Events Staff

Molly D'Esopo, Senior Communications  
Specialist

Joanna Engstrom-Brown, Events Coordinator

Jackie Fox, Senior Science Writer; Director of  
Publications and Communications

Davia Lilly, Director of Design and Production

Richard Messick, Web, Print, and Multimedia  
Technician

Price Tyson, Information Technology Director

## Administrative Staff

Kim Biasucci, Senior Administrative Assistant

Elaine Hughes, Senior Administrative Assistant

Maria Jasen, Executive Assistant

Alicia Jones-Harrison, Staff Assistant

Tasha King, Finance & Administration Associate

Tanna Liggins, Senior Administrative Assistant

Darcell Vinson, Senior Administrative Assistant

## Interns

Ryan Morhard

Avigayil Ribner

Yuliya Seldina, MPH

Center for Bios



security





- (1) Andrew Weber, *DoD*. (2) Alexander Garza, *DHS*. (3) Kunal Rambhia and Anita Cicero, *Center for Biosecurity*. (4) Keiji Fukuda, *WHO*; D. A. Henderson, *Center for Biosecurity*. (5) Jennifer Nuzzo, *Center for Biosecurity*. (6) Guénaél Rodier, *WHO*. (7) James B. Petro, (*then*) *NSC*. (8) Thomas V. Inglesby, *Center for Biosecurity*. (9) Dennis Carroll, *USAID*; Scott F. Dowell, *CDC*; Chris Decker, *ODNI*. (10) D. A. Henderson; Donald S. Burke, *University of Pittsburgh Graduate School of Public Health*. (11) Piers Millett, *UN Office of Disarmament Affairs*. (12) James B. Petro; Gigi Gronvall, *Center for Biosecurity*; Thomas V. Inglesby. (13) Gerald Epstein, *AAAS*. (14) Donald S. Burke; Scott McNabb, *Emory University*. (15) Gigi Gronvall. (16) Keiji Fukuda. (17) Donald S. Burke.



VISIT THE CONFERENCE WEBSITE:

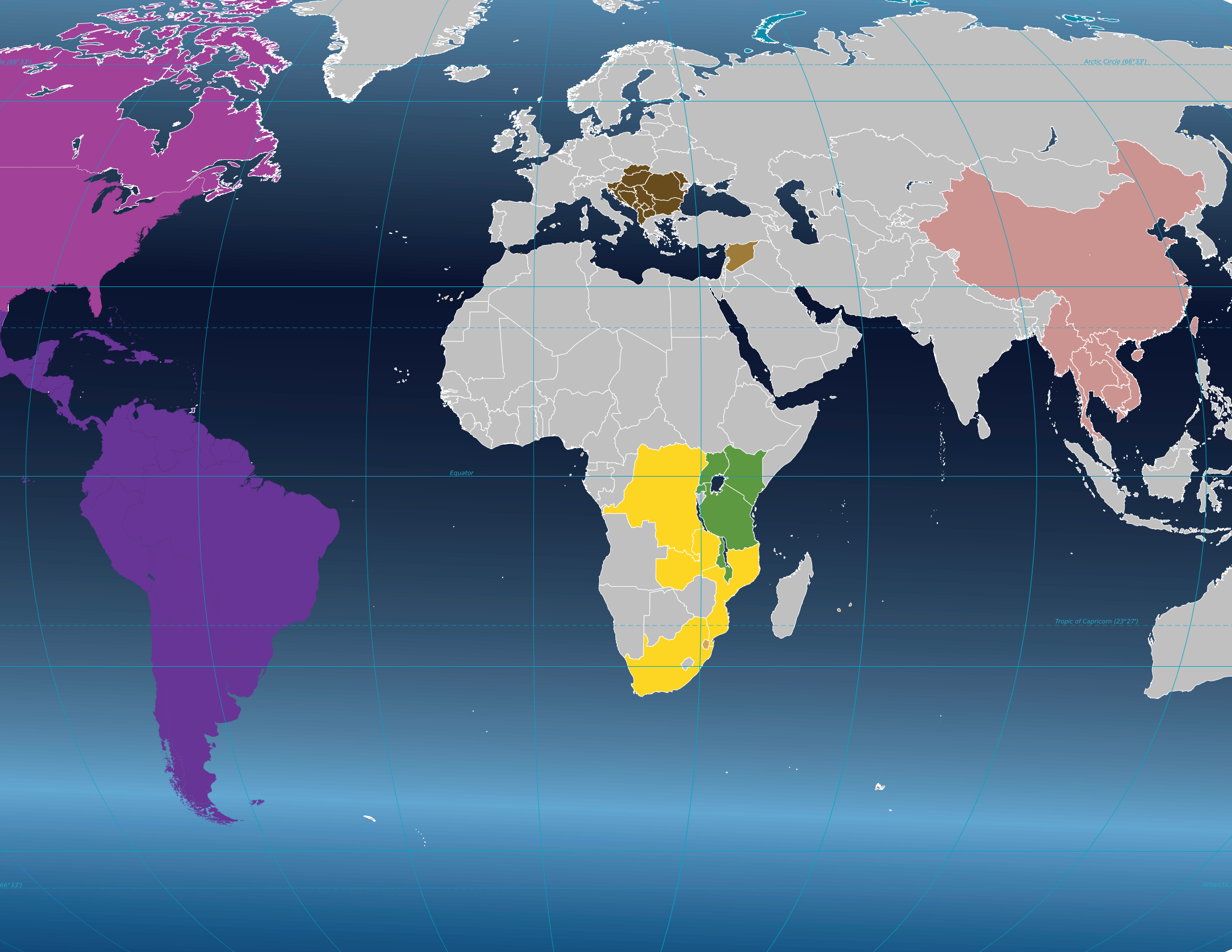
[www.upmc-biosecurity.org/globalhealthsecurity](http://www.upmc-biosecurity.org/globalhealthsecurity)

## Improving Global Health, Strengthening Global Security

In November 2010, the Center hosted this national invitational meeting to address new developments in global health and security policies and programs. Among the issues examined were international cooperation in support of the Biological Weapons Convention and the International Health Regulations; disease surveillance for outbreaks of international importance; exchange of technical information and new strains of pathogens for vaccine, medicine, and diagnostic development; and prevention, early warning, and control of serious disease outbreaks among animals.

Leaders from the federal government, the policy community, top think tanks, academia, and major media outlets attended to hear the views of such experts in global health as Piers Millet of the Implementation Support Unit for the BWC, Keiji Fukuda and Guénaél Rodier of the World Health Organization, Ilaria Capua of OIE/FAO, Ben Petro of the White House National Security Council staff, Scott Dowell of CDC's Division of Global Disease Detection and Response, Andrew Weber of the U.S. Department of Defense, Chris Park of the U.S. State Department, and Mark Smolinski of the Skoll Foundation.

With growing national and international interest in global health security, but relatively few opportunities for leaders in the field to assemble and collaborate, this meeting provided a critical forum for the discussion of the increasing connections between disease outbreaks and national security issues.



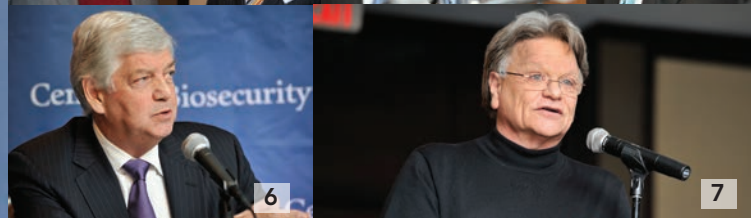
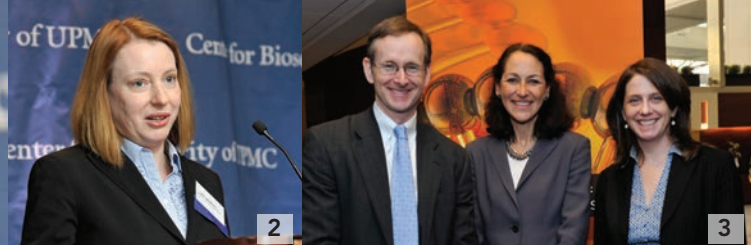
## Strategy for a New International Disease Surveillance Organization

Historically, international disease surveillance and response activities have been conducted chiefly by individual countries acting alone, and, in many cases, countries have been reluctant to share disease outbreak data with neighboring regions. Disease surveillance efforts could be greatly improved with increased sharing of data, best practices, and laboratory capacity within and across regions. Toward that end, a growing number of regional disease surveillance networks are now facilitating such exchanges and are building the detection and response capacities of individual nations and regions.

Under commission from the Nuclear Threat Initiative, the Center provided strategic advice and organizational planning for a new international, nongovernmental organization called CORDS, which stands for “Connecting Organizations for Regional Disease Surveillance.” The mission of CORDS is to improve global infectious disease detection and response by strengthening existing regional surveillance networks and establishing new networks in areas of high disease risk. The members of CORDS represent disease surveillance networks in East Africa, the Mekong Basin, the Middle East, Southern Africa, Asia, and South Eastern Europe.

The Center for Biosecurity developed a strategic plan and bylaws for the new organization and provided recommendations for business planning and resource mobilization. The strategic plan and bylaws were adopted by the CORDS Steering Committee in April 2011.

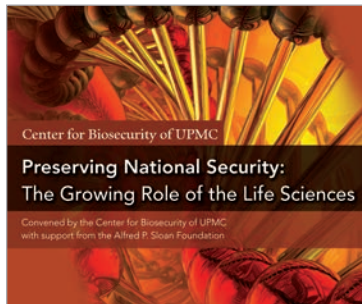




- (1) Commissioner Margaret Hamburg, *FDA*. (2) Gigi Gronvall, *Center for Biosecurity*.
- (3) Thomas V. Inglesby, *Center for Biosecurity*; Commissioner Margaret Hamburg; Anita Cicero, *Center for Biosecurity*. (4) D. A. Henderson, *Center for Biosecurity*; Michael Mair, *FDA*.
- (5) Thomas V. Inglesby; Parney Albright, *LLNL*. (6) George Poste, *Arizona State University*.
- (7) Col. Randall Larsen, *The WMD Center*. (8) Anita Cicero.
- (9) Carol Linden, *HHS*. (10) David Franz, *Midwest Research Institute*.
- (11) MG Philip K. Russell, *HHS OPHP (former)*; D. A. Henderson.
- (12) Michael Kurilla, *NIAID*. (13) Gerald Epstein, *AAAS*. (14) Alan I. Leshner, *AAAS*.
- (15) D. A. Henderson; Luciana Borio, *FDA*. (16) Franca R. Jones, *The White House*.

*“If we find a way to fully harness the potential of emerging science and technology, we will be in a position to take major leaps forward in national security that not only benefit the health and well being of the American people, but also the future of our nation.”*

FDA Commissioner Margaret Hamburg. March 3, 2011



## Preserving National Security: The Growing Role of the Life Sciences

The Center convened leading experts and officials on March 3, 2011, to examine the expanding and evolving connections between advances in the life sciences and U.S. national security. In addressing the transformative role that the life sciences will play in 21st century security policy, distinguished speakers examined such issues as emerging trends, threats and opportunities, U.S. competitiveness in the global life sciences, life sciences diplomacy, and the need for scientists to learn how to engage the public in meaningful discussion.

Speakers included Franca Jones of the White House Office of Science and Technology Policy, George Poste of Arizona State University, Alan Rudolph of the Defense Threat Reduction Agency, Parney Albright of Lawrence Livermore National Lab, Alan Leshner of AAAS, Mike Kurilla of NIH, Carol Linden of BARDA, and Erik Prentice of the ODNI.

FDA Commissioner Margaret Hamburg ended the day with a discussion of FDA's strategy for medical countermeasures and the significant initiative the agency is taking to reform regulatory science efforts. She also reviewed the agency's strategy for improving and expediting evaluation and approval of medical countermeasures that are critical to national security.



holéra



Alama  
za ugonjwa:  
• kuharisha  
maji mengi  
mara nyingi.

## Fièvre hémorragique virale



Wakati unapona alama  
hizi wende mbili kwenye karata  
ya alya ya kamba.

Fièvre



## Improving Diagnosis of Disease Outbreaks Around the Globe

The U.S. government, along with domestic and international NGOs, is committed to accelerating development of tools and technologies for diagnosing infectious diseases around the globe. In fact, there is a significant shortage of diagnostics that can be used effectively in low resource settings, and there are many challenges to their development. Those challenges include regulatory hurdles, a dearth of standards, and few commercial markets for diagnostics, particularly those needed in developing countries.

At the request of the U.S. Department of Defense, Defense Threat Reduction Agency (DTRA), the Center conducted a project to understand major challenges associated with the development of diagnostics and to identify promising technologies that could improve global biosurveillance. We enlisted for the project representatives from the White House, the Bill & Melinda Gates Foundation, Diagnostics for All, PATH, Global Viral Forecasting, DHS, DARPA, NIAID, CDC, the Pan American Health Organization, Lawrence Livermore National Laboratories, the London School of Hygiene and Tropical Medicine, and Becton Dickinson.

Our work uncovered a number of important actions that the U.S. should take to encourage and support development of new diagnostics, which we detailed in our final report to DTRA. Those actions range from better articulation of U.S. strategic goals for diagnostics to greater focus on the needs of end users. We also identified the need for greater understanding of the in-the-field costs associated with diagnostic technologies as well as their biosafety implications. Finally, we noted the need for greater cooperation among technology developers and regulatory authorities and called for targeted investments for scale-up and advanced development of diagnostics.







## Calculating the Economic Burden of Emerging Infectious Diseases

Given the enormous global economic consequences of infectious diseases, there is a surprising absence of data on the actual burden on national economies of specific diseases. There are no readily available, easily updated, or standardized tools for tracking, calculating, and publishing such data. To remedy this, the Center is developing a web-based cost calculator to help public health policymakers estimate, on a country-by-country basis, the true economic costs of outbreaks of infectious diseases such as cholera, dengue, and chikungunya.

Using country-specific cost figures for such factors as ambulatory and inpatient medical care, lost productivity, and earning potential lost through mortality, our web-based tool will give public health officials worldwide a projection of actual costs of emerging diseases based on prevalence and in-country economic data.

For health officials who are faced with difficult decisions and choices regarding which public health interventions to pursue, this tool will provide an opportunity to forecast the point at which life-saving interventions become cost-effective.



## New Tools to Model Infectious Disease Transmission

Billions of people around the world are at risk of dengue infection, and its incidence is growing. The Center has developed a new model of dengue virus transmission aimed at providing decision makers with more precise and valuable information for controlling dengue outbreaks. Our approach, which is based on agent-based modeling, is unique to efforts to understand dengue transmission because it allows modelers to factor in changes in the behavior of individuals during the progression of a disease outbreak. This is a departure from the standard approach to modeling, which generally relies on a fixed set of parameters to calculate outcomes of disease outbreaks.

The model incorporates behaviors, interventions, and geographically specific variables in disease transmission, such as the extent to which people can move inside to air-conditioned houses in an affected area, the extent to which people use insect repellent, and the predicted number of dengue-infected mosquitoes.

With better information and more precise modeling tools, communities will be better able to evaluate the likely success of various response measures and make more informed decisions about interventions.

## Professional Activities

### Selected Publications

- Meeting Report: Improving Global Health, Strengthening Global Security. Gronvall GK, Morhard R, Rambhia K, Ribner A, Sell TK, Watson M, and Wollner S. *Biosecurity and Bioterrorism*. 2011;9(1).
- Meeting Report: Preserving National Security: The Growing Role of the Life Sciences. Bouri N, Gronvall GK, Hansen MB, Rambhia K, Sell TK, Watson M, Wollner S. *Biosecurity and Bioterrorism*. 2011;9(2).
- Diagnostics for Global Biosurveillance. Center for Biosecurity of UPMC. 2011. *In press*.

### Selected Advisory Board, Scientific Committee, and Task Force Memberships

- American Association for the Advancement of Science, Committee on Scientific Freedom and Responsibility
- American Association for the Advancement of Science; Center for Science, Technology and Security Policy
- American National Standards/American Industrial Hygiene Association. Committee to develop the “Standard to Certify Biosafety Level 3 (BSL-3) Laboratories”
- Bioweapons Prevention Project, RevCon Project, Working Group Member
- Department of Defense, Threat Reduction Advisory Committee, Advisory Board Member
- National Research Council’s Board on Life Sciences Report, “Protecting the Frontline in Biodefense Research: The Special Immunizations Program”
- Women in International Security

### Selected Presentations

- ASM Biodefense and Emerging Diseases Research Meeting. Washington, DC. Keynote Address: “The Eradication of Smallpox: A Continuing Saga.”
- Columbia University. Hertog Lecture. New York, NY. “Smallpox Eradication: Death of a Disease . . . Dawn of a New Era.”
- Federal Experts Security Advisory Council. Washington, DC. “WMD Commission on BSAT.”
- George Washington University. Graduate Program in Biohazardous Threat Agents and Emerging Infectious Diseases. Washington, DC. “Atlantic Storm.”
- International Smallpox Symposium – 30<sup>th</sup> Anniversary of Eradication Declaration. “Smallpox Eradication After 30 Years: Lessons, Legacies, & Innovations.” Rio de Janeiro, Brazil. “Smallpox Eradication: Past, Present, and Future.”
- National Institutes of Health Clinical Center. Great Teachers Series. Bethesda, MD. “The Eradication of Smallpox.”
- New York Academy of Medicine. Malloch Circle Dinner. New York, NY. “Inside History on the Achievement of Smallpox Eradication.”
- Oberlin College. Science Department. Cleveland, OH. “Smallpox: The Death of a Disease.”
- Pan American Health Organization 30<sup>th</sup> Anniversary of Smallpox Eradication and Look Ahead to New Challenges. Washington, DC. “Smallpox Eradication and Its Legacy for Global Immunization.”
- Stimson Global Health Security Program. Challenges in Health Diplomacy: Sharing of Influenza Viruses and Access to Vaccines and Other Benefits. Washington, DC. “Moving Forward: Issues and Possible USG Actions.”

## Interviews and Background for Major Media Outlets

*Washington Post*. “Should Last Remaining Known Smallpox Virus Die?”  
March 8, 2011.

*Vaccine News Daily*. “Up-to-Date Information on Vaccines and  
Communicable Diseases; Efforts Renewed to Eradicate Polio.”  
March 1, 2011.

ABC World News. “Can Polio Be Eradicated?” February 26, 2011.

Associated Press. “India Brings Hope to Stalled Fight Against Polio.”  
February 20, 2011.

*Science*. “First U.S. Cowpox Infection: Acquired from Lab  
Contamination.” February 17, 2011.

*New York Times*. “Can Polio Be Eradicated? A Skeptic Now Thinks So.”  
February 14, 2011.

CNN. “Bill Gates: Vaccine-Autism Link ‘An Absolute Lie.’”  
February 4, 2011.

*Seattle Times*. “Gates Wants Last Push to Finish Off Polio.”  
January 31, 2011.

*New York Times*. “Critics Say Gates’ Anti-Polio Push Is Misdirected.”  
January 31, 2011.

*Financial Times* (London). “Gates Polio Goals Questioned.” January 27,  
2011.

*Wall Street Journal*. “Bioterror Fears Prompt U.S. to Keep Its Smallpox  
Cache.” January 18, 2011.

BBC World Service Radio. “Smallpox Eradication.”  
December 9, 2010.

*Los Angeles Times*. “U.S. Denounces Wikileaks’ Release of List of  
Crucial Overseas Facilities.” December 7, 2010.

Global Security Newswire. “Security, Health Officials Said to  
Collaborate Now More than Ever Before.” November 29, 2010.

*Wall Street Journal*. “Virologist Helped Eradicate Smallpox.” November  
26, 2010.

*New York Times*. “Frank Fenner Dies at 95; Tracked End of Smallpox.”  
November 25, 2010.

Global Security Newswire. “U.S. Will Expand Biosecurity Work to Africa,  
Official Says.” November 23, 2010.

*New Scientist*. “Farewell Frank Fenner, Eradicator of Smallpox.”  
November 22, 2010.

Huffington Post. “Resurrecting History’s Pathogens: No Oversight for a  
Dangerous Business.” November 19, 2010.

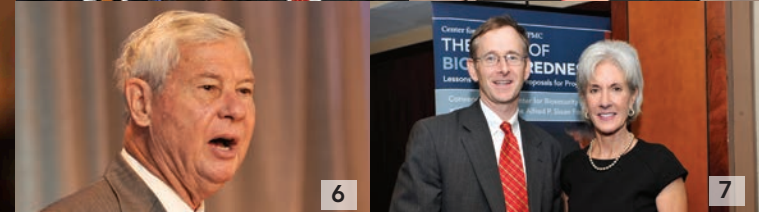
Global Security Newswire. “Synthetic Pathogens Might Pose Bioterror  
Threat, Scientists Warn.” September 10, 2010.

Global Security Newswire/Medill News Service. “WHO Prepares to  
Consider Smallpox Eradication Again.” August 26, 2010.

Global Security Newswire. “International Experts to Discuss Biological  
Weapons Use, Preparedness.” August 20, 2010.

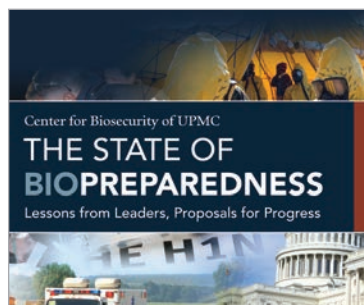
*USA Today*. “Report Urges Genetic IDs for Bioterror Germs.”  
August 3, 2010.





- (1) Secretary Kathleen Sebelius, *HHS*. (2) Eric Toner, *Center for Biosecurity*. (3) Richard Falkenrath, *The Chertoff Group*; Anita Cicero, *Center for Biosecurity*. (4) Alexander Garza, *DHS*; Thomas V. Inglesby, *Center for Biosecurity*. (5) Crystal Franco, *Center for Biosecurity*. (6) Senator Bob Graham, *The WMD Center*. (7) Thomas V. Inglesby; Secretary Kathleen Sebelius. (8) Brooke Courtney, *Center for Biosecurity*; Greg Burel, *CDC*; Michelle Larson, *MN DOH*; David Starr, *NYC DHMH*. (9) Andrew Weber, *DoD*. (10) Brian Kamoie, *The White House*. (11) Peter Jutro, *EPA*; Joseph Donovan, *Beacon Capital Partners*. (12) Richard Hatchett, *White House National Security Staff*. (13) Jennifer Nuzzo, *Center for Biosecurity*. (14) Gigi Gronvall, *Center for Biosecurity*; Senator Bob Graham.

VISIT THE CONFERENCE WEBSITE:

[www.upmc-biosecurity.org/biopreparedness](http://www.upmc-biosecurity.org/biopreparedness)

## The State of U.S. Biopreparedness

In September 2010, the Center convened this conference in Washington, DC, to identify and examine ongoing hurdles, priorities, and opportunities for improvement in U.S. biopreparedness. The day's speakers and panelists discussed accomplishments made in U.S. biodefense capacity during the past 10 years, offered proposals for building on those achievements, and identified priorities and challenges for the future.

U.S. Secretary of Health and Human Services Kathleen Sebelius and former Senator Bob Graham both presented, in addition to Andrew Weber, Assistant to the U.S. Secretary of Defense for Nuclear and Chemical and Biological Defense Programs; Alex Garza, Assistant Secretary for Health Affairs and Chief Medical Officer, U.S. Department of Homeland Security; Richard Falkenrath of the Chertoff Group; John Tesh of the UK Civil Contingencies Directorate; Richard Hatchett of the White House National Security Staff; and other leaders from the public and private sectors.

A number of constructive proposals emerged from this meeting, including pragmatic recommendations related to threat assessment, detection and surveillance, countermeasure development and distribution, public health and medical response, scarce resource allocation, and national resilience policy.







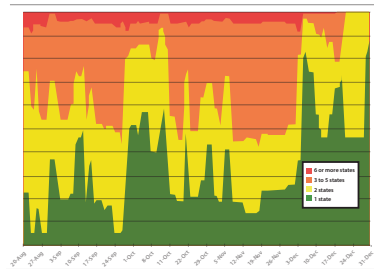
## Assessing the Dengue Threat to the U.S.

Dengue is the most common and fastest spreading mosquito-borne virus in the world. Now endemic to Mexico, most Latin American countries, and parts of the Caribbean, dengue has the potential to become reestablished as an endemic disease in the United States. Recognizing the significant medical, public health, and economic consequences for the country if that were to happen, we published a report on the threat in the U.S. that included a series of recommendations for addressing control of dengue and outbreak response.

Our report, *The Dengue Threat to the U.S.*, described current conditions that could facilitate sustained dengue transmission domestically and offered recommendations that included enhanced clinician awareness of dengue cases, better reporting for all confirmed and suspected cases, increased support for vector surveillance and control programs, and a greater focus on vaccine development.

In addition, because the strategies used to control each of the 3 recent dengue outbreaks in the U.S. had never been published, we undertook an assessment of control strategies used in Hawaii, Texas, and Florida. Our goal was to understand the major challenges, common approaches, and keys to successful elimination of dengue in each area.





## New Approaches to Predicting Disease Outbreaks

The Center is testing new approaches to forecasting infectious disease outbreaks. With the goal of augmenting traditional disease surveillance methods, and in collaboration with researchers from the University of Iowa Electronic Health Market group, we established prediction markets that quantified professional opinion, knowledge, and experience about dengue activity in the U.S.

Although prediction markets have been used before to forecast disease activities, the Center's dengue prediction markets were the first to predict activity for an emerging infectious disease, and they generated considerable interest among disease surveillance experts domestically and internationally.

The hope for such prediction markets would be that advanced indication of disease spread could accelerate public health decision making about outbreak management. And, in fact, traders in our dengue markets accurately predicted a rise in case numbers earlier than official U.S. government reports. These results are being presented in international disease surveillance meetings.

New prediction markets on dengue and on chikungunya virus activity opened for trading in 2011. We are planning additional prediction markets for other emerging infectious diseases while continuing to assess the value of this tool as an adjunct to other disease surveillance and prediction methods.





## Monitoring the Nation's Healthcare System During Crisis

Throughout the 2009 H1N1 pandemic, leaders across the federal government were seeking ways to understand the impact on the nation's healthcare system. They needed data on such factors as the numbers of people hospitalized with flu; the availability of doctors, nurses, and resources; and changes in hospital status. To meet this need, HHS employed its HAvBED system, which collected hospital information from 49 states during the pandemic.

The Center was asked by HHS to evaluate the system's performance in the 2009 pandemic and to gauge future performance during a healthcare crisis.

Our analysis identified several ways to improve efforts to monitor stress on and surge in U.S. hospitals during a public health crisis. Our recommendations to HHS included the following: 1) align federal efforts to collect data from hospitals with existing surveillance systems; 2) create a tiered system that allows data collection efforts to focus on the most critical facilities; and 3) improve the quality and interpretability of data collected by allowing states to lead data analysis.

The final report to HHS, entitled *Healthcare System Capacity and Functioning During Crisis: Lessons from H1N1 (2009) and Recommendations for Future Healthcare Situational Awareness*, provided recommendations for action, and results were presented to senior HHS officials.





EMERGENCY

VINCENTS  
SAINTS

AMBULANCE



## Coping with Casualty Surges in an Emergency

On April 30, 2010, Saint Vincent's Hospital, a not-for-profit, level 1 trauma center located in the West Village in Lower Manhattan, abruptly ceased operations, creating a surge of patients for the remaining hospitals in the area. This unfortunate occurrence provided a unique opportunity for the Center to study and report on the real-time effects of actual hospital surge.

We interviewed executives and medical staff in 4 healthcare institutions in the affected area. These hospitals experienced a 10% to 30% increase in their ED census numbers and felt the effects of the closing of Saint Vincent's in their departments of psychiatry, surgery, and critical care.

We found that hospitals were able to provide care for the suddenly increased number of patients through a variety of means, such as fast-tracking hospital capacity-building projects that had been stalled, streamlining medical credentialing, expanding the scope of care in fast-track emergency units and step-down intensive care units, using hallway beds, and otherwise focusing on accelerating patient flow.

Given the rarity of such situations in the U.S. healthcare system, the Saint Vincent's example offers lessons on how hospitals can continue to provide acceptable medical care to large numbers of patients during extraordinary events.

Our findings and recommendations are presented in the report *The Response to the Sudden Closure of Saint Vincent's Hospital: Learning from a Real, No-notice, and Prolonged Surge Event*.

*“Permanently expanding certain practitioners’ practice scopes to administer influenza and possibly other vaccines could help address some public health workforce shortage issues, which would likely contribute to increased vaccination rates and lower incidence of vaccine-preventable diseases.”*

Brooke Courtney, Ryan Morhard, Nidhi Bouri, Anita Cicero.  
*Biosecurity and Bioterrorism: Volume 8, Number 3, 2010*




## U.S. Legal Preparedness for Public Health Emergencies

During the year, the Center conducted analyses of a number of legal issues that would arise in the event of a public health emergency, and we offered proposals to address or resolve them.

In particular, we analyzed important issues involving state scopes of practice laws, which set forth the range of services licensed practitioners are authorized to perform. In a public health emergency involving surges in patients and shortages of medical staff, expanding specific services that may be performed by healthcare practitioners helps to address heightened health needs. The U.S. has had limited experience with temporary expansion of scopes of practice during emergencies, and there is no standard approach that states use to evaluate when and how to expand the number and flexibility of healthcare professionals who can respond. During the 2009 H1N1 pandemic response, many states expanded scopes of practice so that certain practitioners were authorized to administer the pandemic vaccine. The Center reviewed the diverse range of state approaches that were used during the pandemic and made the recommendation that necessary research be done to consider ways that states could align and potentially harmonize their approaches before the next crisis occurs.

The Center also participated in the CDC's Pediatric Emergency Mass Critical Care expert working group, which was convened to examine issues unique to pediatric critical care response and publish guidelines for practitioners. We provided legal expertise on such issues as informed consent, treatment of children in the absence of their parents, and the importance of familiarity with states' *parens patriae* powers.

Separately, the Center published a legal analysis of the Supreme Court case *Bruesewitz v. Wyeth* that describes the case's implications for liability protections accorded to manufacturers of emergency countermeasures under the PREP Act fund.



*“During H1N1, we were getting pieces of paper faxed to us and we were entering them by hand. There’s no doubt that electronic reporting could have totally transformed what we knew and when.”*

State Public Health Official.

Biosurveillance Where It Happens Working Group. March 10, 2011

## Improving Biosurveillance During Infectious Disease Outbreaks

As the 2009 H1N1 influenza pandemic demonstrated, gathering and making sense of outbreak-related information is crucial for decision making, but it involves a challenging series of actions. The Center designed a project to examine the extent to which state and local health departments have the right capabilities in place to detect and manage an epidemic or public health emergency.

To obtain a wide range of expert judgments on biosurveillance, we convened and led a meeting of public health practitioners from around the country, representatives of national professional organizations, leading academics, and federal officials from the Office of the Assistant Secretary for Preparedness and Response in HHS, CDC, DHS Office of Health Affairs, and the White House National Security Staff.

Our resulting report, *Biosurveillance Where It Happens: State and Local Capabilities and Needs*, will be published and briefed to federal officials responsible for the funding, oversight, and design of biosurveillance programs. It details how early detection of an outbreak depends on a combination of rapid clinical reporting, efficient laboratory reporting, and rapid surveillance systems, all of which will be undermined by budget cuts that affect workforce and infrastructure.

We focused particular attention on improving public health agency access to electronic health information and electronic lab data in times of crisis.



## Professional Activities

### Selected Publications

Isolation of *Aspergillus* in Three 2009 H1N1 Influenza Patients. Adalja AA, et al. *Influenza and Other Respiratory Viruses*. 2011.

Isolation. Adalja AA. *Biosecurity and Bioterrorism*. 2010;8(4).

Understanding Infectious Disease Surveillance: Its Uses, Sources, and Limitations. Sell TK. *Biosecurity and Bioterrorism*. 2010;8(4).

Anticipating the Impact of *Bruesewitz v. Wyeth* on Vaccine and Medical Countermeasure Injury Compensation and Availability. Courtney B, Morhard R. *Biosecurity and Bioterrorism*. 2010;8(4).

Mass Vaccination for the 2009 H1N1 Pandemic: Approaches, Challenges, and Recommendations. Rambhia KJ, Watson M, Sell TK, Waldhorn R, Toner E. *Biosecurity and Bioterrorism*. 2010;8(4).

Letter to the Editor: Standard of Care—In Sickness and in Health and in Emergencies. Gostin LO, Hanfling D, Hodge JG, Courtney B, Hick JL, Peterson CA. *New England Journal of Medicine*. 2010;363:1378-1380.

Expanding Practitioner Scopes of Practice During Public Health Emergencies. Courtney B, Morhard R, Bouri N, Cicero A. *Biosecurity and Bioterrorism*. 2010;8(3).

Universal Influenza Vaccination: An Optimal Goal—But How and When? Henderson DA. *Biosecurity and Bioterrorism*. 2010;8(3).

Stigma, Health Disparities, and the 2009 H1N1 Influenza Pandemic: Burdens on Latino Farmworkers in the U.S. Schoch-Spana M, Bouri N, Rambhia K, Norwood A. *Biosecurity and Bioterrorism*. 2010;8(3).

The Dengue Threat to the United States. Franco C, Hynes NA, Bouri N, Henderson DA. *Biosecurity and Bioterrorism*. 2010;8(3).

Meeting Report: The State of Biopreparedness: Lessons from Leaders, Proposals for Progress. Franco C, Hansen MB. *Biosecurity and Bioterrorism*. 2010;8(4).

### Selected Advisory Board, Scientific Committee, and Task Force Memberships

Institute of Medicine, Forum on Medical and Public Health Preparedness for Catastrophic Events

Institute of Medicine, National Academies Committee on Guidance for Establishing Standards of Care for Use in Disaster Situations

National Academy of Sciences, National Research Council Committee on Animal Models for Assessing Countermeasures to Bioterrorism Agents

National Academy of Sciences, National Research Council Committee on Increasing National Resilience to Hazards and Disasters

National Academy of Sciences, National Research Council Disaster Roundtable Steering Committee

National Consortium for the Study of Terrorism and Responses to Terrorism (START), Executive Steering Committee

NIAID; Southeast Regional Center for Excellence for Biodefense and Emerging Infections; Policy, Ethics and Law Core (PEL Core)

U.S. Department of Health and Human Services, Office of Preparedness and Emergency Operations, ASPR. Expert Panel on Healthcare System Preparedness

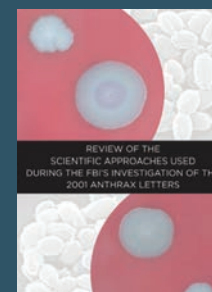
University of Pittsburgh, Preparedness and Emergency Response Research Center, Advisory Group to Public Health Adaptive Systems Studies

## Selected Presentations

- CDC. American Society of Law, Medicine, and Ethics. Public Health Law Association. Using Law, Policy and Research to Improve the Public's Health. Atlanta, GA. "Global Public Health Legal Responses to H1N1."
- Hospital Preparedness Program Region 4 Meeting. Raleigh, NC. "Healthcare System Preparedness for Mass Casualty Events: Essential Role of Healthcare Coalitions."
- International Society for Infectious Diseases. Vienna, Austria. "Electronic Health Markets Used to Predict the Spread of Dengue."
- Johns Hopkins University. International Committee of the Red Cross. Baltimore, MD. "Health Emergencies in Large Populations."
- Maryland Department of Health and Mental Hygiene. "Overview of Crisis Standards of Care Planning Issues: Focus on Legal Issues and Institute of Medicine Committee Work on the Topic."
- NATO. Belgrade, Serbia. "Exploring Synergies between Bioterrorism Preparedness and General Public Health Measures."
- U.S. Department of Defense. DTRA. Arlington, VA. "Global Biosurveillance S&T Requirements Workshop."
- U.S. Department of Defense. DTRA. Countering Biological Threats Working Group. Chantilly, VA. "International Disease Surveillance."
- University of Pittsburgh School of Medicine. Infectious Diseases Grand Rounds. Pittsburgh, PA. "The Threat of Dengue Fever: 3 Outbreaks."
- University of Siena, Italy. "History of the Eradication of Smallpox," "Principles of Infectious Disease Surveillance," and "Future Initiatives in Vaccine-preventable Diseases."

## Interviews and Background for Major Media Outlets

- Homeland Security Today*. "Building Biosurveillance from the Ground Up." February 20, 2011.
- Emerging Health Threats Forum. "Pregnant Women to Get Anthrax Jab." August 4, 2010.
- Global Security Newswire. "Former Senators Criticize Possible Cut to BioShield Funds." July 13, 2010.



## Report on the FBI's Scientific Approach to the 2001 Anthrax Letters Investigation

In the aftermath of the 2001 anthrax attacks, the FBI launched an extraordinary investigation that required 600,000 FBI investigator hours, 10,000 witness interviews, and 4 million megabytes of computer memory to complete.

At the request of the FBI, the National Research Council of the National Academy of Sciences assembled an expert panel to conduct an independent review of the scientific approaches used during the investigation. Center Director Dr. Thomas Inglesby was a member of this expert panel.

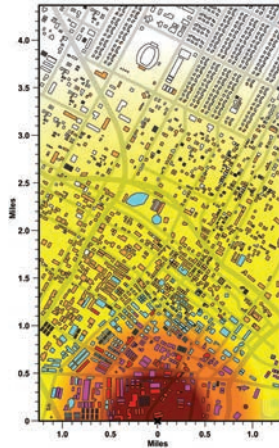
The panel members met during the course of 2 years, evaluating more than 9,000 pages of materials, and receiving presentations by a variety of experts.

The final report, *Review of the Scientific Approaches Used During the FBI's Investigation of the 2001 Anthrax Letters*, was released February 15, 2011.









## Building Rad Resilient Cities

Enough fissile material exists in the world today to make more than 125,000 crude nuclear bombs. Detonation of a nuclear device in a U.S. city could kill hundreds of thousands of people or more, displace millions, inflict significant material damage, and diminish confidence in government. Without question, prevention must be a top U.S. and global priority. Should prevention fail, however, effective contingency planning could prevent widespread death due to exposure to radioactive fallout. The latest modeling shows that, with advanced preparedness planning, tens of thousands of lives could be saved that otherwise would be lost to exposure to lethal levels of radiation.

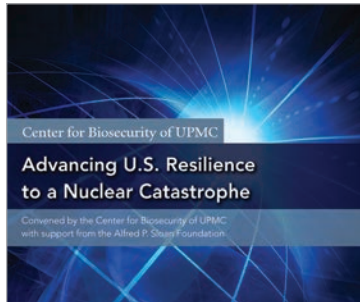
Based on this science, the Center identified the need for clear and actionable guidelines for cities to follow. The *Rad Resilient City Project* that we initiated and designed in response is a major undertaking to provide leaders in high terrorism risk cities with a consensus and science based checklist of preparedness guidelines to protect citizens from fallout. Implementing this checklist could save many thousands of lives in an affected city.

Serving the leadership role for the *Rad Resilient City Project*, we managed the substantive content, addressed policy implications, and led and managed an advisory group of top national experts in the development of the guidelines. The Center will publish and widely disseminate the checklist to governors and mayors; leaders in the private sector; and emergency management, health and safety, and law enforcement officials.

*Image of the notional blast damage zones for a 10 kiloton nuclear explosion. Courtesy of Lawrence Livermore National Laboratory; created by Brooke Buddemeier and Sabrina Fletcher.*



(1) ADM Thad Allen, *RAND Corporation*. (2) Dennis S. Mileti, *University of Colorado at Boulder*. (3) David Weinstock, *Harvard Medical School*. (4) Ann Norwood, *Center for Biosecurity*. (5) Commissioner William C. Ostendorff, *NRC*; Anita Cicero, *Center for Biosecurity*; Thomas V. Inglesby, *Center for Biosecurity*. (6) Scott Deitchman, *CDC*. (7) Monica Schoch-Spana, *Center for Biosecurity*. (8) Richard Waldhorn, *Center for Biosecurity*; John Hick, *Hennepin County Medical Center*; David Weinstock; Eric Toner, *Center for Biosecurity*. (9) Brian Kamoie, *The White House*. (10) Joseph Fitzgerald, *Center for Biosecurity*. (11) Brooke Buddemeier, *LLNL*. (12) Thomas V. Inglesby. (13) RADM Joseph J. Krol, *DOE*. (14) Harold Denton, *NRC (former)*.



VISIT THE CONFERENCE WEBSITE:

[www.upmc-biosecurity.org/nukeresilience](http://www.upmc-biosecurity.org/nukeresilience)

## Advancing U.S. Resilience to a Nuclear Catastrophe

In May 2011, the Center convened this conference to examine policies and practices that could strengthen the capacity of major U.S. cities, and the nation as a whole, to rebound from a terrorist attack involving a nuclear detonation or to recover from a major nuclear accident. The conference followed a year of developments since our first conference on nuclear detonation response in April 2010.

Speakers and expert panelists discussed new models of the effects of a nuclear detonation, public warning messages, hospital care for radiation illness, mass screening and triage strategies, and lessons emerging from the crisis at Japan's nuclear power plant in Fukushima.

Speakers included Brooke Buddemeier of Lawrence Livermore National Lab; Harold Denton, Former Director, Division of Nuclear Reactor Regulation, Nuclear Regulatory Commission; William C. Ostendorff, Commissioner, U.S. Nuclear Regulatory Commission; Thad W. Allen, Senior Fellow, RAND Corporation; Yoshikura Haraguchi, National Hospital Tokyo Disaster Medical Center; Scott Deitchman, CDC; Michael Gresalfi, Federal Emergency Management Agency; Brian Kamoie, White House National Security Staff; and Joseph Krol, NNSA in the Department of Energy.

We also presented the *Rad Resilient City Project* and put forth our checklist of actions for reducing the public's exposure to radioactive fallout after a nuclear detonation.

Through this conference and other ongoing nuclear preparedness projects, the Center continues to provide analysis and new proposals aimed at improving the nation's resilience to a nuclear catastrophe.





## Irradiated or Not: Strategies for Mass Triage

In the immediate aftermath of a nuclear detonation in a major city, tens or hundreds of thousands of people (among millions in the area) may be exposed to clinically significant levels of radioactive fallout. Minor radiation exposure will cause no immediate health concerns, and some radiation exposures will be so high as to be lethal regardless of medical intervention. However, there will be a substantial number of people who are exposed to radiation levels that would be lethal without intervention but survivable with intervention. The goal is to identify this middle group—the ability to determine who should and should not be treated will be crucial. The Center has developed and proposed a new approach for screening and triage based on public/private partnerships that enlists in an emergency the extraordinary capacity of existing networks of private clinical laboratories for high-volume screening.

Two existing U.S. companies together provide more than 50% of outpatient clinical testing in the U.S., and they operate hundreds of laboratories and thousands of specimen procurement centers around the country. With preplanning, coordination, and logistical support, such labs may be able to provide the laboratory surge capacity necessary to conduct screening on the scale that would follow a nuclear detonation.

Our project engaged federal officials, academics, and representatives of national commercial laboratory companies to explore the feasibility of this approach. The proposal, presented at the Center's May 19 conference on resilience to a nuclear catastrophe, will be published in a peer-reviewed journal and briefed to government officials responsible for these issues.







## Implications of the Fukushima Disaster for U.S. Planning

The devastating earthquake, tsunami, and nuclear power plant disaster in Japan are still revealing important lessons for the disaster preparedness community. The Center pursued a number of efforts intended to help us learn from the events surrounding the response and to help improve current U.S. planning for nuclear and radiation disasters.

We published a commentary on early lessons emerging from the Fukushima disaster, such as the expectations for governments in this type of crisis, the need for greater fluency with radiation terms and concepts, and the importance of advance community awareness of disaster plans. The Center also published a brief that described the health risks of radiation exposure and defined radiation terminology and concepts for a public not expert in nuclear terminology. Both the issue brief and the commentary were distributed to the 5,000 subscribers to the Center's *Biosecurity News in Brief* and *Clinicians' Biosecurity Network* publications.

In addition, for our *Clinicians' Biosecurity Network* readers, we published a primer on acute radiation sickness that described the necessity of triage to distinguish among those exposed to low doses of radiation who do not need treatment, those who received high doses that will be lethal regardless of treatment, and those who received intermediate doses, the effects of which can be survived with proper treatment.

In our May meeting on nuclear disaster resilience, we paid particular attention to the implications of the Fukushima disaster for U.S. planning.

## Professional Activities

### Selected Publications

Commentary: Scarce Resources for Nuclear Detonation: Project Overview and Challenges. Coleman CN, Knebel AR, Hick JL, Weinstock DM, Casagrande R, Caro J, DeRenzo EG, Dodgen D, Norwood AE, Sherman SE, Cliffer KD, McNally R, Bader JL, Murrain-Hill P. *Disaster Medicine and Public Health Preparedness*. 2011;5 Suppl 1:S13-9.

Social, Psychological, and Behavioral Responses to a Nuclear Detonation in a US City: Implications for Health Care Planning and Delivery. Dodgen D, Norwood AE, Becker SM, Perez JT, Hansen CK. *Disaster Medicine and Public Health Preparedness*. 2011;5 Suppl 1:S54-64.

Preparing to Save Lives and Recover After a Nuclear Detonation: Implications for U.S. Policy. Bouri N, Norwood A, Sell TK. *Biosecurity and Bioterrorism*. 2010;8(3).

### Selected Advisory Board, Scientific Committee, and Task Force Memberships

American Psychiatric Association, Committee on Psychiatric Dimensions of Disasters

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response, Office of Preparedness and Emergency Operations, Executive Steering Committee: Allocation of Scarce Resources Following an Attack Using an Improvised Nuclear Device

U.S. Department of Homeland Security, Federal Emergency Management Agency, Response Directorate, Nuclear/Radiological Communications Working Group

### Selected Presentations

U.S. Department of Homeland Security. Federal Emergency Management Agency. 2010 Improvised Nuclear Device National Strategy Program Forum. Washington, DC. “Key Findings from ‘Preparing to Save Lives After a Nuclear Detonation: Implications for U.S. Policy.’”

### Interviews and Background for Major Media Outlets

National Public Radio. “Decontamination After Radiation Exposure: Simpler than You May Think.” March 17, 2011.

*USA Today*. “L.A. Dry Run Shows Urban Nuke Attack ‘A Survivable Event’.” December 15, 2010.

Federal News Radio, *Science and National Security*. “How to Plan for Improvised Nuclear Devices.” July 26, 2010.

*“Terrorist networks such as al-Qaeda have tried to acquire the material for a nuclear weapon. And if they ever succeeded, they would surely use it.”*

President Barack Obama. *Nuclear Security Summit*, 2010





*“Preparing for the next public health crisis is a job that never stops.”*

HHS Secretary Kathleen Sebelius. Conference on *The State of Biopreparedness: Lessons for Leaders, Proposals for Progress*. September 23, 2010

## Public Engagement in Disaster Planning

Top national planning documents, including the U.S. government's *National Health Security Strategy*, have called for much greater efforts in informing and empowering individuals and communities to respond to major disasters. There is growing consensus in and out of government regarding the role that public and civic organizations must play in response to such catastrophes and to the real limits of governmental response. In order to gauge the level of governmental commitment and support for building public engagement at the local level, the Center evaluated the capacity of local health departments around the country to engage people to prepare and respond to disasters.

The Center analyzed national survey data and found that half of the nation's health departments did not have a public information specialist, and that the absence of that type of position correlated with lower levels of community engagement in emergency preparedness. Our analysis also found that public health departments are largely not equipped to facilitate community dialogue and planning, and that additional resources will be needed to build stronger connections to the public, businesses, and faith-based organizations. The findings are to be published in a peer-reviewed journal.

As a second phase of this effort, the Center is conducting case study interviews with health departments that have either high-performing or high-aspiring community engagement programs in their emergency preparedness plans. We are developing our own national survey to measure the current capacity of health departments to involve citizens and community-based groups in public health preparedness.

CONGRESSIONAL SENATOR SERIES  
on Biological and Nuclear Security  
Honorary Chairman: Senator Clinton  
Panel Discussion:  
Considerations for the Reauthorization of the  
Prevention and All Hazards Preparedness Act





VISIT THE CONFERENCE WEBSITE:

[www.upmc-biosecurity.org/PAHPA/seminar](http://www.upmc-biosecurity.org/PAHPA/seminar)

## Congressional Seminar Series on Biological and Nuclear Security

With the Senate Caucus on WMD Terrorism as honorary co-host, the Center initiated a Congressional Seminar Series to examine important legislative issues related to U.S. biological and nuclear security.

The purpose of the seminars is to provide Congressional staff and the broader biological and nuclear security policy communities with analysis and information of value to their deliberations. The seminars feature recognized leaders in the field and focus on issues that are salient to the work of the U.S. Congress.

The first seminar in the series, held in March 2011, addressed issues pertaining to the pending reauthorization of the Pandemic and All-Hazards Preparedness Act. Discussion focused on the impact of the original bill on U.S. preparedness; the details of its beginnings, development, and original purposes; the public health and hospital system implications of reauthorization; and a range of expert recommendations about priorities for the bill's reauthorization.



INTERACT WITH THIS MAP ONLINE:

[www.upmc-biosecurity.org/selectagentmap](http://www.upmc-biosecurity.org/selectagentmap)

## Mapping Outbreaks Caused by Select Agent Pathogens

The U.S. regulates 80 human, animal, and plant pathogens as part of the Select Agent Program, which imposes strict controls on researchers' access to those pathogens. Not widely recognized is that most of those pathogens are found in natural settings throughout the world. To demonstrate their ubiquity, the Center mapped the number, source, and location of disease outbreaks caused by the 80 select agent pathogens during a single 22-month period (January 1, 2009–October 31, 2010).

The Center's judgment is that there are clear limitations to the Select Agent Rule. The first limitation is illustrated by our map, which shows that most select agents are naturally occurring and thus are obtainable for legitimate or nefarious use from non-laboratory, non-U.S. sources. A second limitation is that the program and laws apply only within U.S. borders. Critics of the Select Agent Program have pointed out that this provision of the rule creates difficulties in international scientific collaboration and scientific progress on pathogens that cause outbreaks naturally all over the world.



## Professional Activities

### Selected Publications

Everywhere You Look: Select Agent Pathogens.  
Rambhia KJ, Ribner AS, Gronvall GK. *Biosecurity and Bioterrorism*. 2011;9(1).  
Comments on HHS Action Plan to Prevent Healthcare-Associated Infections. Adalja AA. *Biosecurity and Bioterrorism*. 2010;8(4).  
Federal Agency Biodefense Funding, FY2011-FY2012. Franco C, Sell TK. *Biosecurity and Bioterrorism*. 2011;9(2).

### Selected Advisory Board, Scientific Committee, and Task Force Memberships

American Anthropological Association, Committee on Public Policy  
Commission on the Prevention of Weapons of Mass Destruction and Terrorism  
Council on Foreign Relations  
Malaria Eradication Research Agenda Advisory Committee  
March of Dimes, Technical Advisory Committee  
National Academy of Sciences, Institute of Medicine, Committee on Health Threat Resilience  
National Academy of Sciences, National Research Council Committee on Science of the Anthrax Investigation

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention Advisory Committee to the Director, National Biosurveillance Advisory Subcommittee  
U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Office of Public Health Preparedness and Response, Board of Scientific Counselors  
U.S. Department of Health and Human Services, National Biodefense Science Board Federal Advisory Committee, Disaster Mental Health Subcommittee  
U.S. Department of Homeland Security, Biodefense Net Assessment Executive Review Panel  
U.S. Department of Homeland Security, Biological Emergency Advisory Team  
U.S. Environmental Protection Agency, National Drinking Water Advisory Council

### Selected Presentations

2010 National BioWatch Workshop: Detection and Beyond: Biodefense for America's Cities. Milwaukee, WI. "Pushing Ahead to Better Protect the Nation."  
2011 Public Health Preparedness Summit. Atlanta, GA. "Health Agency Infrastructure for Community Engagement in Public Health Emergency Preparedness: Case Study Findings."  
Centers for Disease Control and Prevention. Influenza Division and Influenza Coordination Unit. Atlanta, GA. "Pandemic Impact and Severity Assessment."  
Institute of Medicine Workshop on Advancing Regulatory Science for Medical Countermeasures. Washington, DC. "The Future: Synthetic Biology, Computational Biology, and Platform Technologies."  
Stimson Global Health Security Program. Challenges in Health Diplomacy: Sharing of Influenza Viruses and Access to Vaccines and Other Benefits. Washington, DC. "Moving Forward: Issues and Possible USG Actions."  
Uniformed Services University of the Health Sciences. Center for the Study of Traumatic Stress. Department of Psychiatry. Bethesda, MD. "Crisis and Emergency Risk Communication for Disasters and Terrorism."

U.S. Department of Health and Human Services, Assistant Secretary for Preparedness and Response and Centers for Disease Control and Prevention. New York, NY. "Tale of Our Cities: Planning for Interdisciplinary Responses to Terrorist Use of Explosives."

University of Pittsburgh School of Medicine. 1st year Medical Microbiology Course. Pittsburgh, PA. "Bioterrorism and the Agents Employed."

University of Pittsburgh School of Medicine. Infectious Diseases Fellowship Core Lecture. Pittsburgh, PA. "Bioterrorism and the Agents Employed."

### Interviews and Background for Major Media Outlets

*Christian Science Monitor*. "9 Books Bill Gates Thinks You Should Read." March 25, 2011.

*Boston Globe*. "\$1B Effort Yields No Bioterror Defenses: Mass. Labs in Line to Join Scaled-Back Pentagon Program." January 17, 2011.

*Pittsburgh Post Gazette*. "PA. Scores Well on Emergency Readiness: Experts Question Criteria Used to Achieve Rankings." December 15, 2010.

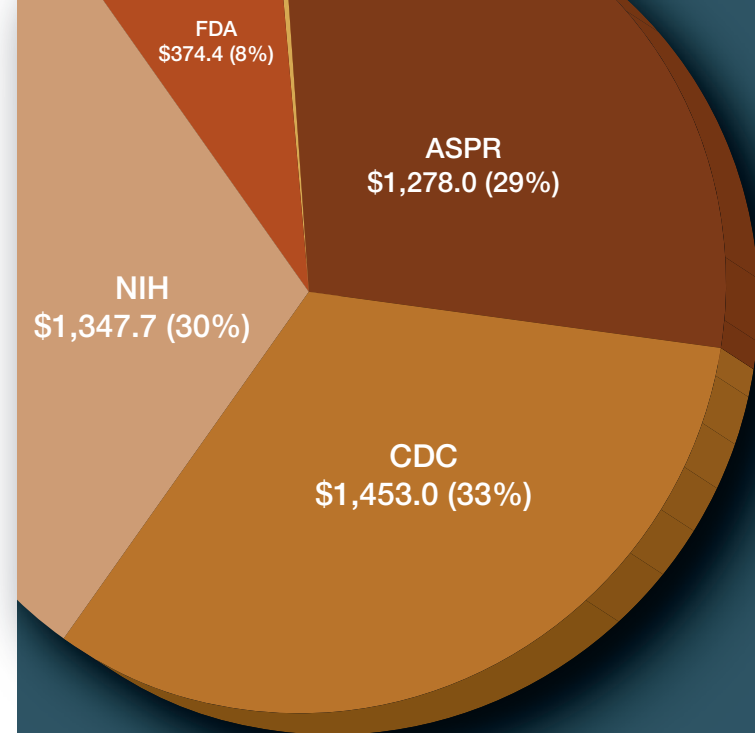
*Christian Science Monitor*. "Why Senator Lugar Is Worried About Terrorism in East Africa." November 12, 2010.

*Global Security Newswire*. "Biodefense System Overhaul Was Necessary, HHS Secretary Says." September 27, 2010.

*Federal News Service*. "Remarks by Health and Human Services Secretary Kathleen Sebelius at the Biopreparedness in 2010 Summit." September 23, 2010.

United Press International/Medill News Service. "Smallpox Stores Stir Controversy." August 24, 2010.

*Nature*. "Committee Recommends a Sequence-Based System for Identifying Pathogens." August 3, 2010.



## Annual Federal Biodefense Budget Analysis

Since 2004, the Center has published an annual analysis of the U.S. biodefense budget, which spans 8 agencies and departments across the federal government. As in past reports, this year's *Federal Agency Biodefense Funding FY2011-FY2012* identifies all major biodefense-related programs in the federal agencies, describes their stated objectives, details the president's FY2012 budget request, and compares the current request with previous years' budgets.

This analysis is used widely as a reference within the U.S. government biodefense community. It has also become a standard reference for research institutions and members of the news media who report on biodefense.

# BIOSECURITY AND BIOTERRORISM

BIODEFENSE STRATEGY, PRACTICE, AND SCIENCE

## *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*

Thomas Inglesby and D. A. Henderson are Coeditors-in-Chief of this peer-reviewed journal, the only one of its kind, which ranks among the top 10 journals in international relations. The journal is now in its ninth year of publication, with a readership that has grown steadily since its inception in 2003.

More than half of the journal's subscribers are from outside the U.S., with an international audience of individual and institutional subscribers in Canada, South America, Europe, India, China, and countries across Asia.

The majority of online traffic is from libraries of major U.S. and international academic institutions and U.S. government agencies, including CDC, the GAO, the USDA, Harvard, Johns Hopkins, the British Library, the Max Planck Institute, the Institut Pasteur, and the Mayo Clinic. Article downloads from the online version increased 45% in the first quarter of 2011.



## Amesh A. Adalja

## Biosecurity News Today

The Center tracks a broad array of national and international news outlets, peer-reviewed scientific literature, and key reports from the U.S. government, NGOs, and international agencies to ensure that the most relevant news is compiled.

This email newsletter covers ongoing disease epidemics, emerging threats to national and homeland security, public health and hospital preparedness and response, medical countermeasures development, and cutting-edge scientific research pertaining to biosecurity.

In the last year, we compiled and delivered more than 1,500 news items from more than 300 global outlets to international, national, and local leaders and practitioners.

## CBN Titles, 2010-2011

Redefining Influenza “Pandemic”	Cholera in Haiti and Beyond
Absence of Smallpox “Take” May Not Indicate Revaccination Failure	Efficacy and Safety of Peramivir
Dialysis in a Disaster Setting?	Electronic Health Market Used to Predict the Spread of Dengue in the U.S.
Hematopoietic Elements of Acute Radiation Sickness	Influenza Update: Highlights from the 48th Annual Meeting of IDSA
Distinguishing Bacterial Pneumonia from 2009 H1N1 Influenza Pneumonia	Universal Flu Vaccination of Healthcare Personnel: A Patient Safety Issue
Social Network Analysis and Whole Genome Sequencing Aid in TB Outbreak Investigation	Lassa Fever in Philadelphia
Immunomodulation in 2009 H1N1	Hundreds of Cutaneous Anthrax Cases in Bangladesh
Healthcare Worker Mortality During the 1918 Influenza Pandemic	Typhoid Fever: A Reemerging Threat?
Airborne Transmission of Prions	Is Rift Valley Fever Virus a Real Risk for the United States?
Intravenous Immunoglobulin for Pandemic Influenza	An Alternative Approach to Pandemic Influenza that Clinicians Everywhere Could Use
Are Immune Complexes Responsible for Severe Cases of 2009 H1N1 Influenza?	Pertussis Resurgent in California

## Clinicians’ Biosecurity News

Established in the wake of the 2001 anthrax attacks, the Center’s *Clinicians’ Biosecurity News (CBN)* serves as a source for timely and reliable updates during biosecurity emergencies and provides biweekly expert updates on issues in clinical biosecurity. We reach several thousand subscribers in every state in the U.S. and 60 countries worldwide. Our expert synopses of new developments in infectious diseases, drug development, public health preparedness, and public policy highlight biosecurity implications of clinical issues, identify areas in need of research, and call attention to unusual events and emerging outbreaks.

Subscribe to *Biosecurity News Today*:  
[www.upmc-biosecurity.org/biosecuritynews](http://www.upmc-biosecurity.org/biosecuritynews)

Subscribe to *Clinicians’ Biosecurity News*:  
[www.upmc-cbn.org/subscribe](http://www.upmc-cbn.org/subscribe)

*“I believe the combination of 24 x 7 social media; different uses of spectrum, bandwidth, and computation, including increased computation through cloud computing; and the ability of people to gather and aggregate virtually to produce social behaviors has created the sociological equivalent of climate change.”*

ADM Thad Allen, Senior Fellow, RAND Corporation.

Conference on Advancing U.S. Resilience to a Nuclear Catastrophe.

May 19, 2011





All photos from Center events, 2009-2011. ROW 1, L-R: Paula Olsiewski, *The Alfred P. Sloan Foundation*; COL Randall Larsen, USAF (Ret), *The WMD Center*, and former Senator Bob Graham, *The WMD Center*; John Tesh, *UK Civil Contingencies Secretariat*, and Anita Cicero, *Center for Biosecurity*; Anita Cicero and Thomas Inglesby, *Center for Biosecurity*; D. A. Henderson, *Center for Biosecurity*; Tara O'Toole, *U.S. Department of Homeland Security* (former CEO and Director, *Center for Biosecurity*). ROW 2, L-R: Richard Hatchett, *White House National Security Staff*; Richard Besser, *ABC News*; ADM Thad Allen, *RAND Corporation*; Laura Holgate, *White House National Security Council*, and James B. Petro, (then) *White House National Security Council*; Commissioner Margaret Hamburg, *U.S. Food and Drug Administration*; Commissioner William C. Ostendorff, *NRC*; George Poste, *Arizona State University*. ROW 3, L-R: Tara O'Toole; Anita Cicero; Tammy Taylor, (then) *The White House*; Bob Kadlec, *Homeland Security Council* (former); David Marcozzi, (then) *White National Security Council Staff*; Joan Rohlfing, *Nuclear Threat Initiative*; Senator Bob Graham. ROW 4, L-R: Thomas R. Frieden, *U.S. Centers for Disease Control and Prevention*; Franca Jones, *The White House*; David Franz, *Midwest Research Institute*, and Andrew Weber, *U.S. Department of Defense*; Richard Danzig, *Center for a New American Security*; Thomas Inglesby and Parney Albright, *Lawrence Livermore National Laboratories*; Thomas Inglesby and Secretary Kathleen Sebelius, *U.S. Department of Health and Human Services*.

## More than a Decade of Leadership and Scholarship

Prior to joining UPMC in 2003 as the Center for Biosecurity, the group was founded in 1998 as the first and only academic center focused on biosecurity policy and practice. The Center's work has helped to identify the character and potential consequences of major biological threats, the policies needed to protect the nation, and the response capacities necessary to diminish the impact of such an event.

In the late 1990s, the Center led a major effort to develop consensus guidelines for medical and public health management of anthrax, smallpox, plague, botulinum toxin, tularemia, and the hemorrhagic fever viruses. The results were published in the *Journal of the American Medical Association (JAMA)*, and this effort was central in helping shape U.S. biosecurity planning prior to 2001.

In the years after 2001, the Center has hosted more than a dozen high-profile events, including 2 major biosecurity tabletop exercises: *Dark Winter* (2001), which focused on domestic response to a covert release of smallpox, and *Atlantic Storm* (2005), which led internationally recognized leaders through a bioterrorism scenario that centered on the response to a smallpox attack.

In recent years, the Center's efforts have broadened to include pandemics, natural disaster response, emerging infectious diseases, global health, and nuclear disasters and emergencies, while retaining commitment to analyzing biosecurity challenges and solutions.

Through its research and publications, policy and program analysis, expert working groups, Congressional testimony, scenario exercises, national meetings, and small meetings and briefings with government leaders, the Center has developed a reputation as an independent, valued source of new ideas and pragmatic advice for reducing the dangers posed by biological, nuclear, and other major dangers and challenges facing the country.



Thomas V. Inglesby, MD

*Chief Executive Officer and Director*

Dr. Inglesby was appointed CEO and Director of the Center for Biosecurity of UPMC in November 2009. He was one of the Center's founding members in 1999, and served as Chief Operating Officer and Deputy Director from 2004 to 2009.

Dr. Inglesby is an internationally recognized biosecurity expert whose work over the past decade has helped shape the development of the field. He has played a leading role in all of the Center's high-impact initiatives, including the *Atlantic Storm* and *Dark Winter* exercises and a series of seminal JAMA articles on the medical and public health response to the most dangerous biological agents. Dr. Inglesby has played a central role in development of the Center's strategic priorities and programs over the years. He has expanded and deepened the Center's expertise in biosecurity while at the same time establishing new initiatives to improve response to emerging infectious diseases and natural disasters, as well as preparedness for nuclear terrorism and radiation disasters.

Dr. Inglesby was recently named Chair of the Board of Scientific Counselors to CDC's Office of Public Health Preparedness and Response. He has been chair or a member of a number of National Academy of Sciences committees, and he has served in an advisory capacity to the Defense Science Board, the Departments of Health and Human Services and Homeland Security, the National Institutes of Health, and the Office of the Director of National Intelligence. Most recently, in 2009-2011, Dr. Inglesby was a member of the National Academy of Sciences expert committee that reviewed the scientific approaches used during the investigation of the 2001 anthrax letters.

Dr. Inglesby has been invited to brief White House officials from the past 3 presidential administrations on national biosecurity challenges and priorities, and he has delivered Congressional testimony on biological threats and preparedness.

Since 1999, Dr. Inglesby has authored or co-authored more than 75 peer-reviewed articles, reports, and commentaries on a wide range of public health and national security issues. In 2010, he co-authored "Necessary Progress in Biosecurity" with Senator Tom Daschle for the *Harvard Law and Policy Review*. He is Coeditor-in-Chief of the journal *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, which he helped to establish in 2003 as the only peer-reviewed journal in the field. In addition, Dr. Inglesby was principal editor of the 2002 JAMA book *Bioterrorism: Guidelines for Medical and Public Health Management*. He is regularly consulted by major news outlets for his expertise and insight on issues pertaining to biosecurity, biodefense, and response to public health disasters.

Dr. Inglesby is an Associate Professor of Medicine and Public Health at the University of Pittsburgh Schools of Medicine and Public Health. He completed his internal medicine and infectious diseases training at Johns Hopkins University School of Medicine, where he also served as Assistant Chief of Service in 1996-97. Dr. Inglesby received his MD from Columbia University College of Physicians and Surgeons and his BA from Georgetown University.



Anita Cicero, JD  
*Chief Operating Officer and Deputy Director*



Ms. Cicero joined the Center in early 2010 as Deputy Director and Chief Operating Officer. Working with the CEO, she directs operations, strategic and budget planning, and program development at the Center. Since her arrival at the Center, she has helped to expand its initiatives in the realms of nuclear preparedness and detection and response to international disease epidemics. In collaboration with the Nuclear Threat Initiative, she recently provided strategic and governance advice for the creation of CORDS, a new international organization dedicated to improving global infectious disease detection and response by linking regional disease surveillance networks.

Ms. Cicero has nearly 2 decades of experience as a practicing attorney in both the U.S. federal government and the private sector. Before joining the Center, Ms. Cicero served as the Managing Partner in charge of the Washington, DC, office of Drinker, Biddle & Reath, LLP, where she was responsible for more than 300 lawyers and staff.

At Drinker Biddle, she formed and managed a range of biopharmaceutical consortia focused on scientific, regulatory, and policy issues, through which she acquired considerable skills in structuring consensus approaches to complex regulatory and scientific challenges. Her work in that realm required collaboration with members of Congress; the World Health Organization; the European Commission; the U.S. Food and Drug Administration; the

U.S. Departments of State, Defense, and Health and Human Services; and the Environmental Protection Agency. On behalf of her clients, Ms. Cicero led a number of major initiatives related to compliance with international environmental treaty mandates, international data protection and security laws, and human subject research protections for clinical trials.

In the realm of biosecurity, Ms. Cicero managed a consortium of companies that focused on advancing public policy to foster research and development of medical countermeasures. Among its accomplishments, the consortium provided invited analysis to the U.S. government on strategy and organizational capacity and developed recommendations for advancing the science of efficacy studies for countermeasures in the absence of human subject data.

Before entering private practice, Ms. Cicero focused on environmental litigation and counseling. As a trial attorney in the Honors Program at the U.S. Department of Justice, Environmental Enforcement Section, Ms. Cicero represented the EPA in civil litigation under the Clean Air Act, the Clean Water Act, and the Comprehensive Environmental Response, Compensation and Liability Act.

Ms. Cicero is a graduate of the Yale Law School and Oberlin College.



D. A. Henderson, MD, MPH

*Distinguished Scholar*

Dr. Henderson is a Distinguished Scholar at the Center for Biosecurity of UPMC and a Professor of Public Health and Medicine at the University of Pittsburgh. He is Dean Emeritus and Professor of the Johns Hopkins School of Public Health and a Founding Director (1998) of the Johns Hopkins Center for Civilian Biodefense Strategies. From November 2001 through April 2003, he served as the Director of the Office of Public Health Emergency Preparedness and, later, as a Principal Science Advisor in the Office of the Secretary of the Department of Health and Human Services.

Dr. Henderson's previous positions include: Associate Director of the Office of Science and Technology Policy, Executive Office of the President (1990-93); Dean of the Faculty of the Johns Hopkins School of Public Health (1977-90); Director of the World Health Organization's global smallpox eradication campaign (1966-77); and Chief of the Surveillance Section of the Epidemiology Branch of the Centers for Disease Control (1961-66).

In 2002, he received the Presidential Medal of Freedom, the nation's highest civilian honor. He is the recipient of the National Medal of Science, the National Academy of Sciences' Public Welfare Medal, and the Japan Prize, shared with 2 colleagues. He has received honorary degrees from 17 universities and special awards from 19 countries.

Dr. Henderson serves as an advisor to many organizations in the United States and abroad. He is a member of the National Academy of Sciences and the Institute of

Medicine, a Fellow of the American Academy of Arts and Sciences, an Honorary Fellow of the National Academy of Medicine of Mexico, an Honorary Fellow of the Royal College of Physicians of London, an Honorary Member of the Royal Society of Medicine, and a Fellow of a number of professional medical and public health societies.

In June 2009, Prometheus Books published a book by Dr. Henderson entitled *Smallpox: Death of a Disease*. It is a personal account of the challenges, obstacles, and disasters faced by an intrepid international program in achieving the global eradication of smallpox.

Dr. Henderson is Coeditor-in-Chief of the peer-reviewed journal *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*. Additionally, he has authored more than 200 articles and scientific papers and 31 book chapters and is coauthor of the renowned *Smallpox and Its Eradication* (Fenner F, Henderson DA, Arita I, Jezek A, and Ladnyi ID. 1988. Geneva: World Health Organization), the authoritative history of the disease and its ultimate demise.

Dr. Henderson, a Lakewood, Ohio, native, graduated from Oberlin College, the University of Rochester School of Medicine, and the Johns Hopkins School of Hygiene and Public Health. He served as a medical resident at the Mary Imogene Bassett Hospital in Cooperstown, New York.

*“It is the solemn responsibility of government, the private sector, and civil society to plan for the most serious catastrophes that could confront the country. That planning could save countless thousands of lives. It is vital work, and we need to resolve to move forward on it together.”*

-Thomas V. Inglesby, May 19, 2011





## SENIOR ASSOCIATES, ASSOCIATES & ANALYSTS

Row 1, left to right: Amesh Adalja, MD, *Associate* • Nidhi Bouri, *Senior Analyst*; Crystal Franco, MPH, *Associate* • Gigi Kwik Gronvall, PhD, *Senior Associate* • Ann Norwood, MD, COL, USA, MC (Ret), *Senior Associate* • Jennifer Nuzzo, SM, *Senior Associate*.

Row 2, left to right: Kunal Rambhia, MS, *Senior Analyst* • Monica Schoch-Spana, PhD, *Senior Associate* • Tara Kirk Sell, MA, *Analyst* • Eric Toner, MD, *Senior Associate* • Matthew Watson, *Analyst* • Sam Wollner, *Analyst*.







## CONTRIBUTING SCHOLARS

Row 1, left to right: Joseph Fitzgerald, MS, MPH, *Senior Associate in Public Health Preparedness, Oak Ridge National Laboratory Homeland Security Program* •

Dan Hanfling, MD, *Special Advisor, Emergency Preparedness and Response, Inova Health System; Clinical Professor, Department of Emergency Medicine, George Washington University*

Row 2, left to right: Fred Selck, MA, *Sommer Scholar and Doctoral Student in Applied Economics, Johns Hopkins University* •

Richard Waldhorn, MD, *Clinical Professor of Medicine at Georgetown University School of Medicine*





## SENIOR ADMINISTRATION & COMMUNICATIONS STAFF

Row 1, left to right: Bruce Campbell, *Chief Financial Officer and Senior Administrator* • Jackie Fox, *Senior Science Writer and Director of Publications and Communications* • Mary Beth Hansen, MA, *Chief Information Officer and Administrative Officer*

Row 2, left to right: Molly D'Esopo, *Senior Communications Specialist* • Davia Lilly, *Director of Design and Production* • Price Tyson, *Information Technology Director*

## Credits

Editor: Mary Beth Hansen

Creative Director and Designer: Davia Lilly

Copy Editors: Jackie Fox and Molly D'Esopo

Printer: MOSAIC, Cheverly, MD

Photos: Many thanks to Kaveh Sardari, who provided the majority of photos in this report, including those that appear on pages: 1, 4, 5, 6, 8, 9, 10, 14, 24, 42, 52, 53, 59, 62, 64, 65, 66, 68, 69, 70, 71



# ALFRED P. SLOAN FOUNDATION

The Center for Biosecurity owes a special thank you to the Alfred P. Sloan Foundation for its support in the year past and in many years prior.

In 2010-2011 the Foundation's support was particularly valuable to our research efforts and in our work to convene leaders to address serious policy challenges.

We deeply appreciate the Foundation's support.

# Center for Biosecurity of UPMC

621 E. Pratt Street, Suite 210  
Baltimore, Maryland 21202  
Tel (443) 573-3304

[www.upmc-biosecurity.org](http://www.upmc-biosecurity.org)  
[www.upmc-cbn.org](http://www.upmc-cbn.org)