

UPMC CENTER FOR
HEALTH SECURITY

Expanding our priorities

2012-2013

UPMC

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

UPMC's commitment to the Center has allowed us to be independent and innovative and to rise to meet new and unexpected challenges in health security.

Our Mission

The UPMC Center for Health Security works to protect people's health from the consequences of epidemics and disasters and to ensure that communities are resilient to major challenges.

The Center examines how scientific and technological innovations can strengthen health security. We advance policies and practice to address a range of challenges, including the global rise in emerging infectious diseases, a continued risk of pandemic flu, major natural disasters, a vulnerable infrastructure, outbreaks of foodborne illness, and the potential for biological, chemical, or nuclear accidents or intentional threats.

An important part of our mission is to connect diverse and international communities of health and science experts, industry representatives, and government officials to strengthen collective efforts to improve health security.

The Center conducts independent research and analysis, and we communicate our results to inform the work of decision makers across communities. We do this work through the combined talents of our scholars in science, medicine, public health, law, social sciences, economics, and national security.



*As a nation, we must be prepared for the full range
of threats, including a terrorist attack involving
a biological agent, the spread of infectious diseases,
and food-borne illnesses.*

President Obama, *US National Strategy for Biosurveillance*, July 2012

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Letter from the Director

New Name, Expanded Focus

Our organization marked its 15-year anniversary this year, and we took the big and logical step of changing our name to the UPMC Center for Health Security. Our new name signals our commitment to protecting people's health from the consequences of epidemics and disasters and to ensuring that communities are resilient to major challenges.

Fifteen years ago, the Center started as an organization dedicated to diminishing the public health consequences of biological threats, and we will continue to work on the many biosecurity challenges before us. In recent years, the Center's focus has expanded to address the continued risk of pandemics and emerging infectious diseases, such as new human cases of H7N9 influenza; frequent natural disasters; our dependence on vulnerable infrastructure; outbreaks of foodborne illness; health emergencies caused by acts of terrorism; and the potential for biological, chemical, or nuclear accidents or deliberate threats. It is time, on our 15th anniversary, to make sure that our name and goals reflect our current priorities.

The number and range of serious threats to the health of the public over the past year make clear how much we depend on our preparedness and response efforts and why we need to continue to invest in and strengthen them. We saw this in October 2012, when Hurricane Sandy led to the evacuation of approximately 6,000 people from hospitals, nursing homes, and other healthcare facilities and to the abandonment of several towns. Superstorm Sandy was just one of the numerous federally declared disasters that, over the past 2 years, have required an estimated \$136 billion in emergency appropriations.

In the spring of this year, it was alleged that chemical weapons were used in Syria, with serious implications for US and global foreign policy. We witnessed the outbreak in China of a novel H7N9 influenza virus with a high case fatality rate and no vaccine. The cost of that outbreak has been about \$6.5 billion as of this writing. Most recently, a new coronavirus with frightening similarities to SARS, including some limited person-to-person spread, has caused illness and deaths in the Middle East, UK, and

France. As of this writing, ricin has been sent in letters to President Obama, Mayor Michael Bloomberg, and other public figures. Fortunately, no one has been hurt, but it was a dangerous event nonetheless. The nation witnessed scores of terrible injuries from the Boston Marathon bombings, the aftermath of which required a response from a major US city's healthcare system, the likes of which we've not seen in modern times.

Against the backdrop of these events, antibiotic resistance is on the rise, making it possible for patients in US hospitals to contract untreatable infections. Lethal foodborne outbreaks are occurring too frequently in the US and abroad. In 2013, we should not have to worry that our breakfast cantaloupe could lead to a lethal listeria infection. And of course, we continue to live with the specter of biological, chemical, and nuclear terrorism. The problems that threaten US and global health security are countless, but we believe that with concentrated effort, we can continue to forge new solutions.

The Center will continue to examine new scientific and technological innovations that can strengthen our ability to prepare for and respond to these types of exigent emergencies.

We will also continue to connect diverse, international communities of health and science experts, private sector leaders, and government officials to advance our collective efforts to improve health security. We are very pleased with the new partnerships we are developing in China, Taiwan, and Kuwait to address

health security challenges, and we look forward to exploring other new international opportunities in the coming year.

We will keep working toward a better understanding of what strategies and plans could save the most lives, where resources might have the maximum benefit, what management and investment strategies have the largest impact, and what national policies and international collaborations can produce the most important gains. We want to raise expectations about what's possible to achieve in health security.

The Center's mission is in keeping with UPMC's commitment to shaping tomorrow's health system through technological innovation, research, and education. We thank the CEO of UPMC, Jeff Romoff, for his continued support of our mission.



Thomas V. Inglesby, MD
CEO and Director

UPMC

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Top (L to R): D. A. Henderson, Kim Biasucci, Price Tyson, Darcell Vinson, Jackie Fox, Richard Messick, Ryan Morhard, Randy Larsen, Ann Norwood. **Middle (L to R):** Davia Lilly, Jennifer Nuzzo, Nidhi Bouri, Sanjana Ravi, Amesh Adalja, Kathleen Minton, Elaine Hughes, Tara Kirk Sell, Kunal Rambhia, Mary Beth Hansen. **Bottom (L to R):** Tanna Liggins, Maria Jasen, Gigi Kwik Gronvall, Matthew Watson, Tom Inglesby, Anita Cicero, Monica Schoch-Spana, Tasha King, Eric Toner, Molly Bowen, Andrea Lapp

Staff of the UPMC Center for Health Security, 2012-2013

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

Tom Inglesby, MD, Chief Executive Officer and Director

Anita Cicero, JD, Chief Operating Officer and Deputy Director

Distinguished Scholar

D. A. Henderson, MD, MPH, Distinguished Scholar

Senior Associates & Associates

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Gigi Kwik Gronvall, PhD, Senior Associate

Ryan Morhard, JD, Associate

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Jennifer Nuzzo, SM, Senior Associate

Monica Schoch-Spana, PhD, Senior Associate

Eric Toner, MD, Senior Associate

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Tasha King, Chief Financial Officer and Senior Administrator

Publications, Communications, and Events Staff

Mary Beth Hansen, MA, Chief Information and Administrative Officer

Molly Bowen, Senior Communications Specialist

Jackie Fox, Senior Science Writer; Managing Editor, *Biosecurity and Bioterrorism*

Andrea Lapp, Director of Events

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

Tanna Liggins, Senior Administrative Assistant

Darcell Vinson, Senior Administrative Assistant

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Kate Gilles

Contributing Scholars

Joseph Fitzgerald, MS, MPH

Dan Hanfling, MD

Fred Selck, PhD

Richard E. Waldhorn, MD



Improving US Response to Epidemics,
Biological Threats, and Natural Disasters



Diagnosing Infection at the Point of Care

The need to diagnose infections more quickly and accurately is a national security priority in the face of persistent and emerging biological threats. Current market forces incentivize development of diagnostics for chronic diseases and metabolic conditions but not for infectious diseases. Innovation in infectious disease diagnostics has been slow, but it has been suggested that establishment of industry standards could hasten development of critical new tests.

To explore the feasibility of that approach, DTRA CB/RD asked the Center to identify the clinical needs and business cases for expansion of the current point-of-care (POC) infectious disease diagnostics market as well as the gaps that inhibit this expansion. We were also asked to consider the possible effect of industry-wide standards on sparking new development. To complete this analysis, we focused on the potential creation and use of standards for infectious disease diagnostics and assessed the challenges and opportunities related to development and uptake of new diagnostic tests, particularly those at the point of care.

In the resulting report, *Diagnosing Infection at the Point of Care: How Standards and Market Forces Will Shape the Landscape for Emerging Diagnostic Technologies*, the Center advised the government on the range of standards that could, in principle, be developed for POC diagnostics; analyzed the strengths and weaknesses of each approach; and suggested when and how standards might be most effective in advancing the field. We also identified paths forward to address the market obstacles to development and adoption of POC diagnostics.



Monoclonal antibodies have great potential usefulness for DoD force protection against biological warfare agents as well as naturally occurring infectious disease threats. mAbs display characteristics that would complement other medical countermeasures in a comprehensive strategy: they are highly specific, can be administered to all populations regardless of immune status, and offer pre- and postexposure protection as well as therapeutic benefits.

Next Generation Monoclonal Antibodies: Challenges and Opportunities

Assessing New Approaches to Treating Infectious Disease

Monoclonal antibodies (mAbs), now used primarily for treating cancer and immune diseases, have the potential to be quite valuable in treating infectious diseases. Unlike broad-spectrum antibiotics, mAbs have great specificity. They generally have low rates of adverse reactions, and they may provide protection against antibiotic-resistant organisms. Unlike vaccines, they confer immunity almost immediately, and they can be administered to all people, regardless of immune status. At this point, mAbs are expensive, and their use against infectious diseases is limited. But there is some evidence that costs may be decreasing. With further development, these drugs could play an essential role in the treatment of infectious diseases in the future.

The US Department of Defense (DoD) enlisted the Center to work in collaboration with the Defense Threat Reduction Agency (DTRA) and TASC, Inc., to assess the technical feasibility and strategic implications of developing and using next-generation mAbs for protection against and treatment of disease caused by infectious disease threats. The Center report for this project, *Next-Generation Monoclonal Antibodies: Challenges and Opportunities*, recommended that DoD pursue development of mAbs as part of its medical countermeasure strategy. We also recommended that DoD invest more deliberately in mAb research and development and work with private industry to meet such DoD requirements as improved administration and lower production costs.



The sooner the source of an outbreak is identified, the sooner we can issue accurate targeted warnings and take the contaminated products off the shelves. . . . And the sooner people stop eating contaminated food, the sooner the sickness stops.

Jennifer Nuzzo, *Food Safety News*, March 8, 2013

Strengthening US Response to Foodborne Disease Outbreaks

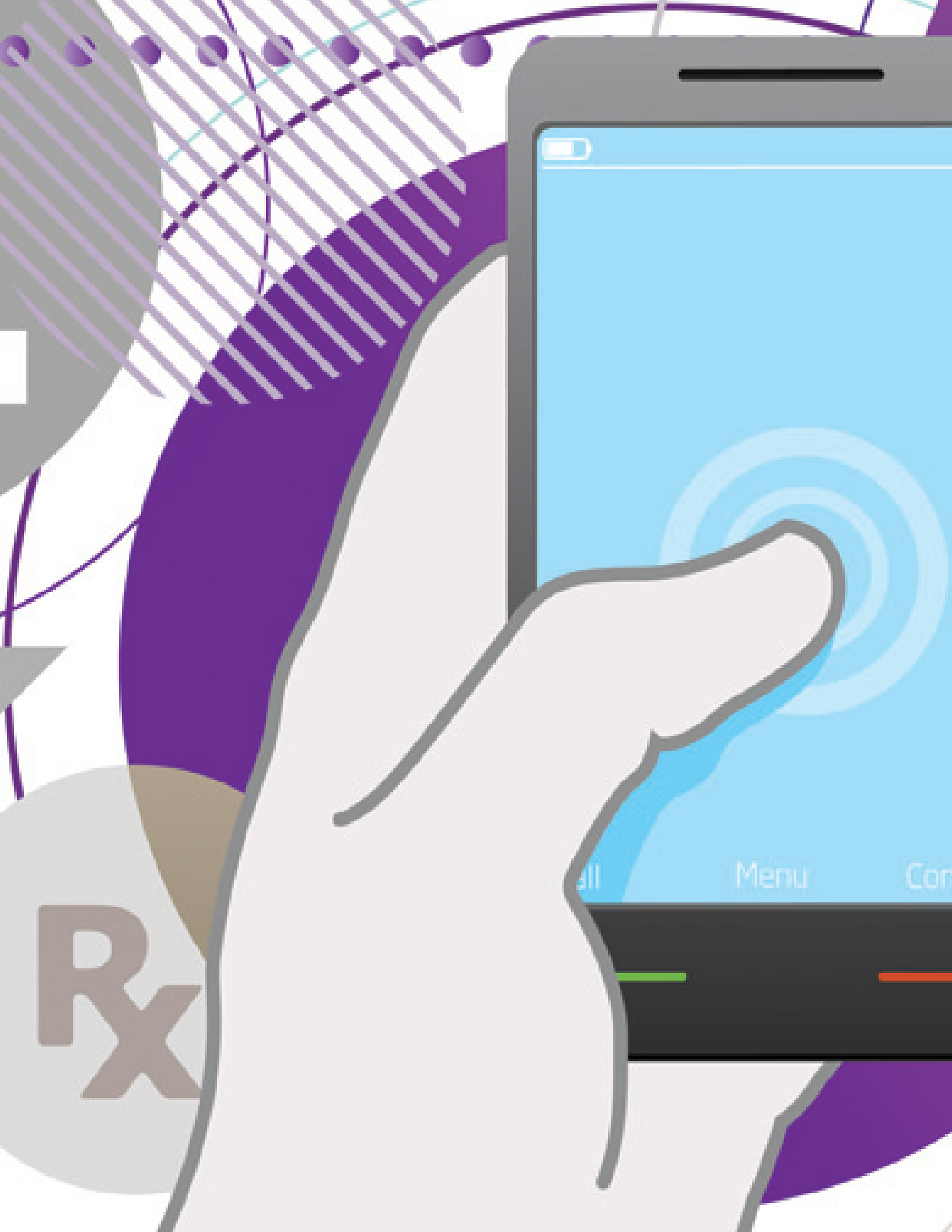
The Center's project on foodborne disease outbreaks was the first to focus on the science, policies, and practices that comprise the nation's response to such outbreaks. We undertook this project because each year, foodborne disease sickens or kills an alarming number of people in the US, with an economic toll that amounts to billions of dollars.

A range of important efforts are under way to prevent foodborne disease outbreaks, but even as the US strengthens prevention efforts, major outbreaks will continue to occur—our food supply comes from too many sources to stop all outbreaks. It is going to be critical that we combine prevention initiatives with new programs aimed at early detection and increase the speed of response so as to limit both the numbers of people sickened and economic losses.

In our report, *When Good Food Goes Bad: Strengthening the US Response to Foodborne Disease Outbreaks*, we detailed the particular difficulties facing current response programs, such as changes in clinical and diagnostic practices that

are inadvertently making outbreaks harder to investigate; state-by-state variance in detection ability; and continual funding cuts that undermine existing public health surveillance, detection, and response capacities.

The Center recommended actions that would accelerate and improve US response to foodborne illness outbreaks, including decreasing the time to initiation of outbreak investigations by enlisting expert assistance from academic institutions that specialize in medicine and public health and increasing resources for foodborne disease programs in health departments. We also recommended applying the innovative tools and unique expertise of private sector food producers and distributors, who share strong incentives to end outbreaks quickly. Finally, we stressed the need to develop effective diagnostic technologies that will allow public health officials to identify, investigate, and rapidly end major foodborne disease outbreaks.



Promoting Public Health's Use of mHealth Technologies and Social Media for Preparedness

Social media is playing an increasingly prominent role in disaster response. The Center is working in partnership with the National Association of County and City Health Officials (NACCHO) to identify the factors that enable or preclude use of social media and mobile technologies to aid local health departments nationwide in disaster preparedness efforts.

In many rural areas, it is difficult for public health officials to reach community members to deliver key information before or during an emergency. During the 2009 H1N1 influenza pandemic, for instance, some rural health departments took to Facebook because it was free, fast, and accessible to community members when meetings were not possible and other communication channels were not effective. Text messaging has also been used by public health officials to disseminate important

information when power goes out. But in most public health departments, there is little experience with the use of these platforms as tools for planning and preparedness and little knowledge of the organizational constructs required to support their use.

The Center and NACCHO have identified health departments across the US that are using mHealth and social media technologies, and we are working to understand the practices and factors (eg, resources, training, etc.) that increase the value and adoption of these technologies for improving preparedness. When completed, this effort will advise officials in health departments around the country on how they might take better advantage of social media and mHealth technologies in their efforts to improve emergency preparedness for outbreaks and disasters.



*The sooner we can detect and understand a threat, the faster
we can take action to protect the American people.*

President Obama in letter announcing **National Strategy for Biosurveillance**, July 2012

Building Better Surveillance to Enhance Disease Detection

One of the important demands on infectious disease surveillance programs is that of drawing together and integrating a range of distinct information streams so as to identify indicators or patterns that may signal the onset of new outbreaks. To meet that challenge, DTRA enlisted the expertise of the Center, in partnership with Draper Laboratories, Thermopylae Sciences and Technology, and other partners, to help develop new technology that will improve the collection, visualization, sharing, and analysis of surveillance data from a broad range of sources.

The goal is to create an effective new tool that could improve and speed the efforts of those in

government now responsible for early warning of new outbreaks. The tool would integrate traditional health and animal surveillance data sources with nontraditional information sources, such as media coverage and social media streams, and analyze and transform the information quickly into alerts for leaders. Integrating and making sense of complex surveillance data will require new ways of using cloud computing, computational engineering, machine learning, data management and mining, and public health planning and operations. The Center, together with its partners, is bringing this combined expertise to bear on the problem.

National Public Health Preparedness Summit

The National Association of County and City Health Officials (NACCHO) invited the Center to organize and convene “To Stay or Go? What Sandy Taught Us About Hospital Evacuations and Healthcare Preparedness,” one of 3 plenary sessions at the March 2013 National Public Health Preparedness Summit in Atlanta. Attended by more than 1,500 professionals annually, the summit is the country’s preeminent national conference on public health and medical preparedness. It is sponsored by the most prestigious organizations and associations in the field: the Association of Public Health Laboratories (APHL), the Association of Schools of Public Health (ASPH), the Office of the Assistant Secretary for Preparedness and Response (ASPR), the Association of State and Territorial Health Officials (ASTHO), the US Centers for Disease Control and Prevention (CDC), the Council of State and Territorial Epidemiologists (CSTE), the US Food and Drug Administration (FDA), and NACCHO.

Panelists for the Center’s session identified a number of major challenges in the response to Hurricane Sandy: difficulty managing spontaneous volunteers; difficulty attending to the health and medical needs of uninsured, displaced, and indigent people; inadequate attention to continuity of psychiatric care; and unresolved issues related to the evacuation and transfer of prisoners. The speakers also recognized a general need to revisit crisis standards of care and surge planning and provided their judgments about how to address these issues.





Identifying Best Practices in Emergency Hospital Evacuation

In October 2012, Hurricane Sandy forced the evacuation of more than 6,000 patients from 5 hospitals and dozens of nursing homes and adult care facilities in and around New York City. With the goal of identifying important lessons for hospitals nationwide, the Center is studying the impact of these major evacuations and how the surrounding healthcare system managed the consequences.

The project is examining many of the key aspects of patient evacuations and redistribution: management of patient surge, disaster communications, mass transport of patients, and continuity of care. We are assessing the coordination of patient distribution to receiving hospitals to determine what worked best when hospitals had to cope with a sudden influx of patients evacuated from multiple hospitals, nursing homes, and other healthcare facilities. We are

also examining the roles of state and local public health agencies and the local hospital association in facilitating this large-scale evacuation.

The project's final report will identify policies and procedures that helped the New York hospitals to manage this crisis and will offer recommendations to help other hospitals nationwide prepare for such crises in the future.

As a follow-on project, the Center has partnered with the University of Maryland's Center for Health and Homeland Security to plan, facilitate, and evaluate hospital evacuation exercises in the Baltimore-Washington area. The exercises will help guide development and refinement of practices and protocols for the state's hospitals during large-scale emergencies.

PROFESSIONAL ACTIVITIES

Selected Publications

When Good Food Goes Bad: Strengthening the US Response to Foodborne Disease Outbreaks. Nuzzo JB, Wollner SB, Morhard RC, Sell TK, Cicero AJ, and Inglesby TV. Center for Biosecurity of UPMC. March 2013.

Next-Generation Monoclonal Antibodies: Challenges and Opportunities. Gronvall GK, Rambhia KJ, Adalja AA, Cicero A, Inglesby TV, and Kadlec R. Center for Biosecurity of UPMC. February 2013.

A Conceptual Approach to Improving Care in Pandemics and Beyond: Severe Lung Injury Centers. Adalja AA, Watson M, Waldhorn RE, and Toner ES. *Journal of Critical Care*. Published ahead of print November 14, 2012. DOI:10.1016/j.jcrc.2012.09.016.

A Survey of Hospitals to Determine the Prevalence and Characteristics of Healthcare Coalitions for Emergency Preparedness and Response. Rambhia KJ, Waldhorn RE, Selck F, Mehta AK, Franco C, and Toner ES. *Biosecurity and Bioterrorism*. 2012;10(3):304-313.

White House Releases National Strategy for Biosurveillance. Nuzzo J. Center for Biosecurity of UPMC. August 1, 2012.

Interviews and Background for Major Media Outlets

Pittsburgh Post Gazette. “Ricin a Commonly Used Biocrime Agent.” April 25, 2013.

News/Talk 106 WTVN AM (Columbus, OH). “Ricin Tainted Letter Sent to the President.” April 4, 2013.

MedPage Today. “Ricin Deadly, but Not an Effective WMD.” April 17, 2013.

Bloomberg News. “Ricin from Castor Plant Available to Convert to Poison.” April 17, 2013.

The Verge. “The Killer Bean: Why Ricin Is Used for Bioterror.” April 17, 2013.

NBC News. “Deadly Ricin: Poisonous but Clumsy Weapon.” April 17, 2013.

Voice of Russia Radio. “How Serious Is the Threat Posed by Ricin?” April 17, 2013.

NBC News. “US Races to Make Vaccine Against New Bird Flu—Just in Case.” April 10, 2013.

Food Safety News. “Foodborne Illness Outbreaks Need More Aggressive Response.” March 8, 2013.

Los Angeles Times. “Troubled BioWatch Program at a Crossroads.” December 22, 2012.

Global Security Newswire. “FDA Offers First License to Drug Produced by Bioshield Program.” December 17, 2012.

ProPublica. “New York Scrambles to Make Up for Shuttered Hospitals.” November 8, 2012.

New York Post. “Nightmare State of Anti-bioterror Plan.” September 18, 2012.

National Journal. “After 8 Years, HHS Countermeasure Program Still a Work in Progress.” September 12, 2012.

Pittsburgh Tribune Review. “Airport Study Ranks Pittsburgh International No. 25 on Disease Spreader List.” July 5, 2012.

Selected Presentations & Briefings

2012 National Healthcare Coalition Preparedness Conference. Alexandria, VA. “Overview of Research on Healthcare Coalitions.”

2013 National Foundation for Infectious Diseases Annual Conference on Vaccine Research, Clements-Mann Lecture. Baltimore, MD. “The Decade of Vaccines.”

George C. Marshall European Center for Security Studies, Health Security and Engagement in Military and International Security Operations Conference. Garmisch-Partenkirchen, Germany. “Health Security as an Early Warning Tool for Emerging Infectious Diseases.”

Johns Hopkins University, ICU Surge Conference. Baltimore, MD. “A Conceptual Approach to Improving Care in Pandemics and Beyond: Severe Lung Injury Centers.”

National Institutes of Health Monoclonal Antibody Workshop. Bethesda, MD. “Next Generation Monoclonal Antibodies: Challenges and Opportunities.”

Pittsburgh International Lung Conference. Pittsburgh, PA. “A Conceptual Approach to Improving Care in Pandemics and Beyond: Severe Lung Injury Centers.” Poster Presentation.

Royal United Services Institute (RUSI) Anthrax Counter Measures 2013 International Conference. London, England. “Session Two: How Will We Know?”

University of Pittsburgh, Dynamics of Preparedness Conference. Pittsburgh, PA. “An Agenda for Future Research Panel.”

Selected Advisory Board, Scientific, Community, and Task Force Memberships

American College of Chest Physicians, Taskforce on Mass Critical Care

Centers for Disease Control and Prevention, Board of Scientific Counselors

Critical Care Maryland Department of Health and Mental Hygiene, Allocation of Scarce Resources Work Group

Department of Defense, Threat Reduction Advisory Committee

Department of Homeland Security, Biodefense Net Assessment

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

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





Strengthening Global Health Security





Tom Inglesby and
Taiwan Minister of Health, Dr. Wen Ta-Chiu

Evaluating Taiwan's Public Health Emergency Preparedness Programs 10 Years After SARS

At the request of Health Minister Wen-Ta Chiu, the Center conducted an independent assessment of Taiwan's public health preparedness programs. Our analysis and recommendations were drawn from a weeklong research visit to Taiwan, during which we participated in extensive bilateral briefings with senior government leaders, scientists, medical officials, public health officials, and vaccine company leaders.

During the past 15 years, Taiwan has experienced several major outbreaks of infectious diseases, which highlighted a national urgency and rationale for building strong preparedness systems and plans for outbreak control. Each outbreak spurred investments by Taiwan to improve epidemic response and yielded systems that have proven useful in subsequent outbreaks. As a result, Taiwan has made impressive gains that have enhanced national public health preparedness.

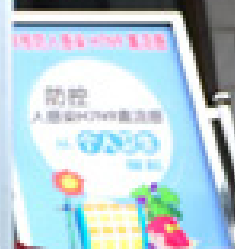
In addition to documenting the noteworthy progress achieved since the 2003 SARS outbreak and identifying the strengths of Taiwan's public health preparedness systems, the Center recommended possible new or complementary approaches to improving preparedness and continuing to strengthen existing systems in advance of an epidemic.

Our findings were published in the December 2012 report *Taiwan's Public Health Emergency Preparedness Programs 10 Years After SARS*, which we submitted to the Minister of Health.



H7N9禽流感应急演练

预防为主 控制疾病





Tom Inglesby with other speakers and organizers at the APEC Workshop "Building Public Health Emergency Response Capacity," Shanghai, China, September 2012

Scientific and Public Health Exchanges with China

At the invitation of the Director of Shanghai CDC, Center leadership presented at the October 2012 Asia-Pacific Economic Cooperation workshop on building public health emergency response capacity and led workshop delegates in a conversation on surveillance and epidemic response in the US. The Center's leaders also toured Shanghai CDC to learn more about the agency's operations and to brief Shanghai CDC officials on various Center initiatives in the area of epidemic response.

Center leaders also met with officials at BGI, a leading international genomics institute based in

Shenzhen, China. The meeting provided a better understanding of BGI's potential to perform whole genome sequencing of newly discovered pathogens and the opportunity to discuss public health preparedness programs in both countries.

During this trip, Center leadership also met with leaders of the China Arms Control and Disarmament Association in Beijing to brief them on the Center's work on civilian safety issues and consequence management related to preparedness for nuclear power plant accidents.





Monica Schoch-Spana; Barges Hmaud Al Barges, President, Kuwait Red Crescent Society (KRCS); Anita Cicero; Yousef Al Merag, Director, Disaster Management and Emergency, KRCS; Mohammad Al Anzi, COO, Kuwait Life Sciences Corporation

Engaging with Kuwait on Public Health Preparedness

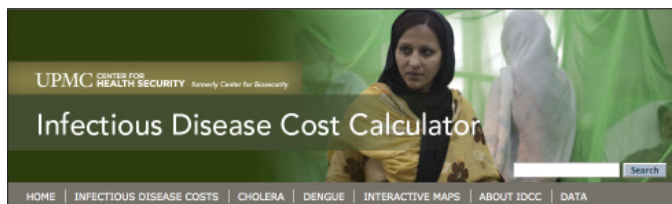
At the invitation of the Kuwait Life Sciences Company (KLSC), the Center engaged in a series of meetings and technical exchanges in Kuwait in May 2013. KLSC supports the public and private sectors in accessing emerging technologies and adopting best practices that could benefit public health and health care in the Gulf region.

During this trip, Center experts participated in the 2013 International EMS/Disaster Management Conference and Exhibition in Kuwait, the first conference of its kind in the country. Our experts presented the Center's Rad Resilient City Initiative to conference delegates and discussed ways in which it could facilitate planning in urban settings

internationally. This was in keeping with the broader goal of the meeting discussions that related to Kuwait's interest in pursuing a joint command system across government ministries to manage disasters more effectively. Center delegates were also fortunate to be invited to tour the Kuwait Red Crescent Society's emergency operations center, the first in the Gulf region.

Government and private sector leaders from Kuwait's Ministry of Health, the American Business Council in Kuwait, and the Kuwait Red Crescent Society invited the possibility of future interaction with the Center on issues of public health preparedness and radiation response planning.





Calculating the Global Cost of Infectious Disease

The Center developed a novel approach to calculating the economic burden of infectious diseases and, using that approach, launched a web-based Infectious Disease Cost Calculator (IDCC) to make this methodology available to global health decision makers around the world. The IDCC now provides country-specific and global estimates of the economic costs of dengue and cholera, and we plan to add data on other diseases in the future.

Surprisingly, data are scarce on the economic burden of many of the world's most significant infectious diseases. While cost estimates for dengue and cholera have been published for a small number of countries, the IDCC applies standardized and transparent methodology to provide the first national level estimates of the costs of these diseases for nearly every country around the world. The calculator also provides the most accurate global cost estimates for dengue and cholera that have been published to date: the annual IDCC global cost estimate for dengue is \$12.28 billion, and the annual IDCC global cost for cholera is \$3.1 billion.

The IDCC provides evidence of the enormous burden of these diseases around the world. The ability to gauge economic losses associated with infectious disease outbreaks is critical to making informed decisions about investments in disease prevention and control at the local, national, and global levels. Health officials, charitable organizations, and others who face decisions about investments in public health interventions need better data to understand the balance between the cost of interventions and the return on investments so their often limited funds can be applied to achieve the greatest good.

In providing a transparent and readily accessible methodology to calculate the cost of disease, our goal is to stimulate international discussion and research that could improve future calculations and promote continued refinement in our understanding of the global and national costs of these diseases.

Drs. David Sack and Duane Gubler, highly respected international leaders on cholera and dengue, respectively, serve as expert advisors to the project.



The Center's Perspective on the H7N9 Outbreak in China

On March 31, 2013, China reported the first case of human infection with a novel H7N9 avian influenza virus. Since then, the Center has published a series of reports analyzing the new outbreak—explaining the significance and implications of the H7N9 pattern of spread, the evolving testing and control efforts, the evaluation of animal reservoirs, and the communications from major national and global health agencies.



Judging the Severity of H5N1

In collaboration with Don Burke, Dean of the University of Pittsburgh Graduate School of Public Health, the Center undertook a study to improve the understanding of the human case fatality rate (CFR) of H5N1 infections. The CFR is important because this rate helps determine the extent to which the international health community should regard H5N1 as a top pandemic danger. The WHO database of confirmed H5N1 cases has a CFR of approximately 60%, a rate more lethal than that of the 1918 influenza pandemic. Some scientists, however, have argued that serologic evidence indicates that the CFR is much lower than 60%. If that is true, the lower fatality rate would provide a rationale for reducing international concern about this virus.

Scientists have conducted a number of sero-epidemiologic studies that test for the presence of H5N1 antibodies as a sign of prior infection. To help refine understanding of the H5N1 CFR, the Center team examined all English language

H5N1 human serology surveys in the international published literature. Of the 29 studies we identified, few reported use of unexposed control groups, and a third did not apply WHO criteria for determining a positive result, making them susceptible to false-positive results. Of those studies that used WHO criteria, only 4 found any positive results to any strain of H5N1 that has been found in recent years. None reported positive results to the H5N1 strain that has spread predominantly throughout Eurasia and Africa. We therefore concluded that there was no compelling serological evidence of widespread mild H5N1 infection and, concomitantly, no evidence to suggest that the WHO calculated 60% case fatality rate should be disregarded. Our resulting article, “Assessment of Serosurveys for H5N1,” was published in *Clinical Infectious Diseases* in February 2013.

PROFESSIONAL ACTIVITIES

Selected Publications

Assessment of Serosurveys for H5N1. Toner ES, Adalja AA, Nuzzo JB, Inglesby TV, Henderson DA, and Burke DS. *Clinical Infectious Diseases*. First published online February 5, 2013.

Taiwan's Public Health Emergency Preparedness Programs 10 Years after SARS. Center for Biosecurity. December 2012.

Improving Epidemic Response: Building Bridges Between the US and China. Rambhia K and Cicero A. *Biosecurity and Bioterrorism*. 2012;10(3):328-331.

The Globalization of US Medical Countermeasure Production and Its Implications for National Security. Adalja AA, Wollner SB, Inglesby TV, and Poste G. *Biosecurity and Bioterrorism*. 2012;10(3):255-257.

Interviews and Background for Major Media Outlets

New York Times. "Wary of Attack with Smallpox, U.S. Buys Up a Costly Drug." March 12, 2013.

CIDRAP News. "WHO Says Polio Drive Must Push on Despite Pakistan Setbacks." January 3, 2013.

National Public Radio. "NIH Revisits Debate on Controversial Bird Flu Research." December 18, 2012.

Selected Presentations

7th Unither Baruch Blumberg Lecture, Oxford University Museum of Natural History. London, England. "Smallpox: Death of a Disease—Miracle and Legacy."

Asia-Pacific Multilateral Pandemic Preparedness, Response, and Recovery Conference. Jakarta, Indonesia. "Vaccine Supplies and Issues in the Asian-Pacific Region."

Christiana Care Health System, 50th Annual William J. Holloway Infectious Disease Symposium, "Holloway 50: Past, Present, and Future." Wilmington, DE. "Smallpox: Death of a Disease . . . a Historic Saga."

European Union Center of Excellence 2013 Jean Monnet Symposium. Pittsburgh, PA. "Contagious Collaboration? Global Health Governance, Infectious Disease Control, and the Role of the European."

Gain-of-Function Research, Highly Pathogenic Avian Influenza H5N1 Viruses: An International Consultative Workshop. Bethesda, MD. "HPAI H5N1 GOF Research and Its Implications for Global Public Health."

George C. Marshall European Center for Security Studies, Health Security and Engagement in Military and International Security Operations Conference. Garmisch-Partenkirchen,

Germany. "Strengthening Surveillance, Improving Global Security."

Georgetown University School of Medicine. Washington, DC. "Using Tabletop Exercises for International Public Health Emergencies."

International Disaster and Risk Conference, Global Risk Forum. Davos, Switzerland. "Environmental Changes and Health Implications Panel."

International Disaster and Risk Conference, Global Risk Forum. Davos, Switzerland. "Health Within Disaster Risk Reduction Panel."

Nuclear Threat Initiative (NTI). Washington, DC. "Global Biological Safety."

Taiwan Centers for Disease Control. Taipei, Taiwan. "US Approaches to Biosurveillance."

Taiwan Centers for Disease Control. Taipei, Taiwan. "US Hospital Preparedness."

Taiwan Centers for Disease Control. Taipei, Taiwan. "The US Experience of 2009 H1N1."

APEC Meeting. Shanghai, China. "Surveillance and Epidemic Response in the US: Valuable Lessons Learned."

Study of Terrorism and Responses to Terrorism, Center for Risk and

Economic Analysis of Terrorism Events, Lund University Centre for Risk Analysis and Management, US Department of Homeland Security, and MSB/Swedish Civil Contingencies Administration, Workshop on Community Resilience. Stockholm, Sweden. “How to Build Public Health Preparedness Partnerships.”

Royal United Services Institute, Pharmaceutical Resilience for Serious Infectious Disease. London, England. “Business Factors Affecting Resilience.”

Selected Advisory Board, Scientific, Community, and Task Force Memberships

Broader Middle East/North Africa Scientific Exchange. American Association for the Advancement of Science

WHO International Health Regulations Expert Advisory Committee

Women in International Security





Raising Awareness, Building Readiness





Too Many Patients, Too Few Resources

What should be done in a catastrophic event, such as a severe pandemic, when the number of patients in need of ventilators is greater than the number of ventilators available? Should healthcare providers be allowed to remove a ventilator from one patient and give it to another? Should one group of people be prioritized to receive care over others? The Center is working with the Johns Hopkins Office of Emergency Management and the Berman Institute for Bioethics to engage citizens in public deliberations on those questions.

We are presenting groups of volunteers from communities around Maryland with a series of specific ethical choices that might have to be made in a future crisis—choices regarding who should have priority access to scarce life-saving medical resources during catastrophic disasters. We will be conducting similar fora with healthcare

professionals. Our findings to date indicate that the public is interested in these issues, is able to give meaningful consideration to the complex ethical dilemmas posed by this type of event, and is able to prioritize and combine ethical principles to arrive at nuanced conclusions about how to manage scarce resources in a disaster.

The goal of the project is to collect the range of diverse perspectives, experiences, and opinions from around the state; no statewide effort to collect public views on these kinds of issues has been done before. Once the state-wide discussions are complete, the results will be presented to Maryland policymakers to help inform their efforts in developing guidance for hospital and public health officials. Through this process, we hope to ensure that decisions made during emergencies are consistent with the values of the people served by the decision makers.





Appraising America's Medical Volunteer System

The Center has conducted the first independent analysis of the US medical volunteer program to identify how medical volunteers are being used in large-scale emergencies, where they are most effective, and what barriers could prevent them from making valuable contributions in a crisis.

These questions became important after the 9/11 terrorist attacks when many medically trained personnel rushed to the World Trade Center site in New York City to offer their assistance. With no official mechanism for coordinating medical volunteers, an ad hoc system was established to get through that disaster. Unfortunately, the spontaneous volunteers were, in many ways, more of a hindrance than a help because there was no way to verify their credentials, they had no training in disaster response, many did not have the necessary situation-specific skills needed, and the volunteers had to be fed and housed. Shortly thereafter, the Medical Reserve Corps (MRC) was established in the Office of the Surgeon General to coordinate deployment of medically trained volunteers to

disaster sites. Today there are more than 900 MRC units ready to respond.

The Center conducted multiple analyses to characterize the demographics, structure, activities, and membership of MRC units across the country. We also reviewed the roles of MRCs during several of the most prominent disasters in the past several years (eg, the Joplin tornado, Hurricanes Irene and Sandy) to identify successes and areas for improvement.

Our research indicates that MRC units are playing an increasingly important role in disaster response, especially in evacuation shelters and dispensing centers. The MRC units also perform public education and community outreach related to disasters and other public health matters. Our work provides the first external review of the national MRC program and suggests improvements to the program to enhance deployment of medical volunteers in disaster response.



National health security stands on a foundation of individuals and communities that are aware of and informed about health security risks and empowered to prevent, protect against, mitigate, respond to, and recover from large-scale incidents with potentially negative health consequences.

Implementation Plan for the *National Health Security Strategy* of the United States of America, HHS, May 2012

Enlisting the Public as Partners in Emergency Preparedness

The important task of integrating local residents into the larger emergency preparedness and response system principally falls to local health departments. Yet, little is known about how these agencies perform this work and what they need to do it well. In an effort to uncover why some communities are leaders in enlisting community support, the Center conducted the first ever national analysis of local health departments to identify the communities that have been most successful in enlisting the public as a partner in emergency preparedness and response and to understand the reasons for their success.

There is widespread agreement in the US federal, state, and local governments that substantial community engagement before and during disasters leads to better outcomes. Citizens, as well as faith-based, community-based, and business organizations, have a wealth of resources to share with emergency authorities—from insights on local

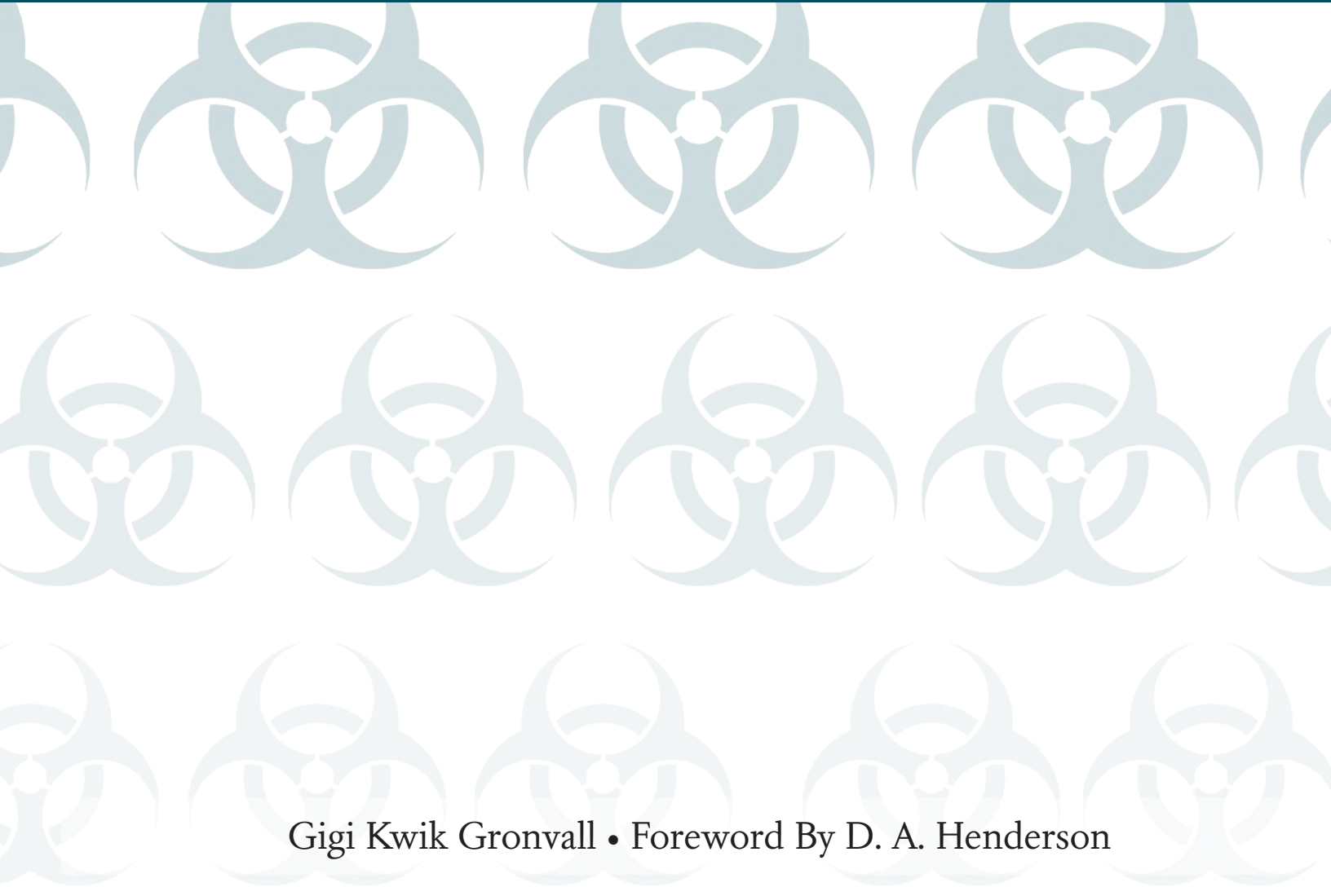
values that should drive the allocation of scarce medical resources, to the labor power needed to run mass vaccination clinics and to feed hungry emergency responders. The Center found that high-performing health departments shared several factors in common: They had a formal community engagement policy, they set aside funds for this work, and they employed people who had experience building community programs.

We will apply our findings to develop and publish guidance to help health department leaders strengthen community engagement efforts, even when money is tight. This project will also give federal policymakers empirical evidence about the infrastructure necessary to achieve the strategic national objective of an informed, empowered, and resilient population, an explicit goal set by the White House and the Department of Health and Human Services.



PREPARING FOR BIOTERRORISM

The Alfred P. Sloan Foundation's Leadership in Biosecurity



Gigi Kwik Gronvall • Foreword By D. A. Henderson

Documenting a Decade of Leadership in Biosecurity

The Alfred P. Sloan Foundation was the first US philanthropy to commit resources to confronting the threat of bioterrorism. Starting in 2000, and over the course of 10 years, the foundation awarded more than \$44 million for a wide variety of efforts, including the National Academy of Sciences' "Fink Report," which influenced the creation of a government advisory body and policies to govern dual-use research of concern; the Model State Emergency Public Health Act, which is now law in most states and updates public health powers; and the study of air filtration for commercial buildings to improve air quality and protect against deliberate introduction of pathogens.

The Sloan Foundation commissioned the Center to write a book to document the many significant contributions of Sloan grantees to the field of

biosecurity. The book, *Preparing for Bioterrorism: The Alfred P. Sloan Foundation's Leadership in Biosecurity*, makes clear that, prior to 2000, there was little science or scholarship on biosecurity, no guidelines or planning tools, and few policies or officials to direct civilian preparedness, planning, and response. Many of the projects Sloan funded were the seeds for response policies and practices that are integral to our national security today. As a result, the US is measurably better prepared to cope with biosecurity challenges and other catastrophic threats to the public's health and national security. The book documents not only the leadership of the Sloan Foundation, but the early history of the field as well.

PROFESSIONAL ACTIVITIES

Selected Publications

Preparing for Bioterrorism: The Alfred P. Sloan Foundation's Leadership in Biosecurity. Gronvall GK. Baltimore, MD: Center for Biosecurity of UPMC; 2012.

Funding for Nuclear Consequence Management-related Programs: FY2012-FY2013. Sell TK and Franco C. *Biosecurity and Bioterrorism.* 2012;10(4):417-419.

Biodefense Funding: Changes from President's Budget to Congressional Appropriations. Sell TK, Gilles K, and Franco C. *Biosecurity and Bioterrorism.* 2012;10(3):321-327.

Interviews and Background for Major Media Outlets

Chicago Sun Times. "South Side Isn't Ready for Health Emergencies." April 22, 2013.

Modern Healthcare. "Preparedness Under Assault." April 22, 2013.

Washington Post. "Plague Draws Attention amid Concern That It Might Be Deployed by Terrorists." April 8, 2013.

Microbe Magazine. "Biocontainment Labs: Some in Use, Others Stymied by Public Outcry." February 2013.

National Public Radio. "Scientists Put an End to Moratorium on Bird Flu Research." January 23, 2013.

Associated Press. "CDC: 11 Biolab Workers Infected from 2004-10." January 15, 2013.

Los Angeles Times. "Troubled BioWatch Program at a Crossroads." December 22, 2012.

National Public Radio. "NIH Revisits Debate on Controversial Bird Flu Research." December 18, 2012.

Selected Presentations

37th Annual Natural Hazards Research and Applications Workshop, University of Colorado. Broomfield, CO.

"Disasters and Community Resilience: National Research Council Findings and Guidance Panel."

American Association for the Advancement of Science. Washington, DC. "The Alfred P. Sloan Foundation: A Decade of Biosecurity Philanthropy."

Defense Advanced Research Projects Agency, Clio Meeting. Atlanta, GA. "Industrialization of Biology: National Security Concerns."

Golden Triangle Business Improvement District, Getting Back to Business After a Catastrophe: A Regional Exercise and Preparedness Summit for Commercial Real Estate Leaders. Washington, DC.

"Survivability and the Region's Response Panel."

Johns Hopkins University Applied Physics Laboratory, Community Emergency Response Network, and the Regional Catastrophic Preparedness Grant Program, Catastrophic Disaster Response: Health, Medical, and Population Planning at the Regional Level. Laurel, MD. "Health, Medicine, and Population—What Might Happen Panel."

National Association of County & City Health Officials, Public Health Preparedness Summit 2013. Atlanta, GA. "Meeting the National Challenge: Measuring Progress in Building Resilient Communities."

Society for Public Health Education, 64th Annual Meeting, The Magic of Health Education: Vision, Imagination, Transformation. Orlando, FL. "What Policymakers Need to Hear from Emergency Preparedness Practitioners about Community Engagement."

University of Maryland, National Academy of Engineering, National Science Foundation, Virginia Tech, and University of Delaware, Infrastructure and Community Resilience: Natural and Human-Caused Disasters Symposium. College Park, MD. "Resilient Health Systems."

University of Maryland Community Research Advisory Board, University of Maryland School of Public Health, College Park, MD. “Community Values and the Allocation of Scarce Medical Resources in Disasters.”

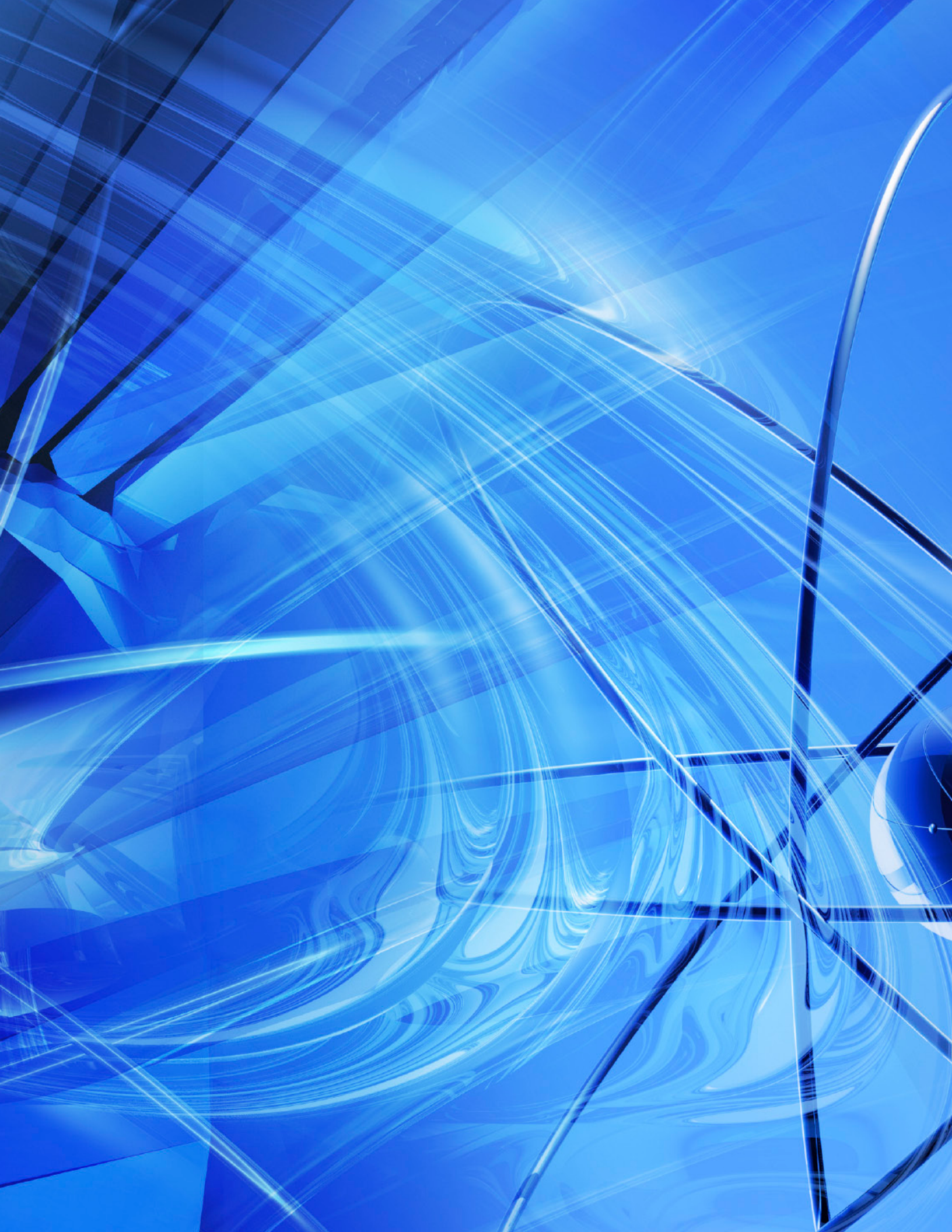
Selected Advisory Board, Scientific, Community, and Task Force Memberships

American Association for the Advancement of Science, Committee on Scientific Freedom and Responsibility

American Psychiatric Association, Committee on Psychiatric Dimensions of Disasters

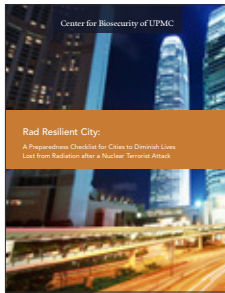
Journal of Disaster Medicine and Public Health Preparedness, Associate Board

National Research Council, Disaster Roundtable, Steering Committee



Preparing for Nuclear and
Radiological Disasters





Building Preparedness for Nuclear Incidents

In early 2013, the Nuclear Threat Initiative, an international private-public partnership working to reduce global threats, offered this assessment of the world's vulnerability to nuclear incidents: "Despite the growing importance attached to nuclear security by world leaders and two Nuclear Security Summits over the past four years, there is still no global system in place for tracking, accounting for, managing, and securing all weapons-usable nuclear materials."

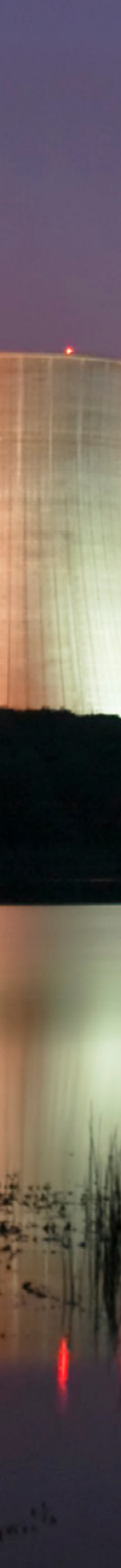
Over the past year, the Center pursued an outreach initiative to engage with officials in public health, emergency management, and radiation control to raise awareness about the benefits for cities of taking the actions recommended in the Center's Rad Resilient City Checklist (www.radresilientcity.org). We presented the checklist to professional gatherings around the country at such events as the National Emergency Management Summit and several regional disaster response planning meetings. Our goal has been to inform communities and leaders throughout the US and in other countries about the critical role that sheltering in place can play in reducing illness and death that result from

exposure to nuclear fallout. In a population that knows how to shelter in place, exposure to fallout can be significantly reduced, which can, in turn, reduce by the tens of thousands the numbers of people sickened or killed by radiation.

Reaching out to the private sector, the Center team met with building owners and operators to underscore the leadership they can offer in educating tenants about the protection afforded by the built environment. We worked with community leaders around the Washington, DC, metro area who are pursuing all-hazards preparedness, and we participated in a regional exercise and planning meeting for commercial real estate leaders.

Most recently, we presented the Rad Resilient City Checklist at the 2013 International EMS/Disaster Management Conference and Exhibition in Kuwait City. At the invitation of Kuwaiti government intermediaries, the Center has begun exchanges with private, public, and nonprofit entities about the potential application of the Rad Resilient City approach in the country and the larger Gulf region.





Improving Emergency Planning and Public Health Preparedness Around US Nuclear Power Plants

The Center is conducting an extensive, first-of-its-kind review of public health activities conducted within emergency planning zones (EPZ) around US nuclear power plants. An EPZ is the geographic area around a nuclear power plant where initial actions are expected to be taken to protect the general public should a nuclear accident occur. The Fukushima accident showed how critical EPZ plans are in ensuring the health of the public by minimizing radiation exposure. Comprehensive emergency planning and preparedness within these areas is crucial to consequence management, which includes reducing or limiting exposure to radiation, and is increasingly a factor in political support of nuclear power.

The Center team is studying the emergency management plans of each EPZ around all US nuclear power plants and speaking with emergency management and health department professionals involved in US EPZs, as well nuclear utility and industry representatives. The project will conclude later this year.

Findings from the current investigation will help inform and enhance post-Fukushima planning on radiological emergency preparedness by deriving lessons learned and best practices.



Radiological Disasters: What's the Difference?

The Center published a report for policymakers that distinguished the essential characteristics of 3 types of nuclear disasters: (1) terrorist detonation of an IND; (2) terrorist use of a “dirty bomb” (ie, radiological dispersion device); and (3) a nuclear power plant accident on the scale of the Fukushima disaster. The distinctions are critical, as the type of disaster dictates the consequences, the levels of radioactive contamination, the threat to human health, and the necessary planning and response. Despite their major distinctions, there is still substantial misunderstanding and misinformation in the policy and health communities regarding the nature of these kinds of events.



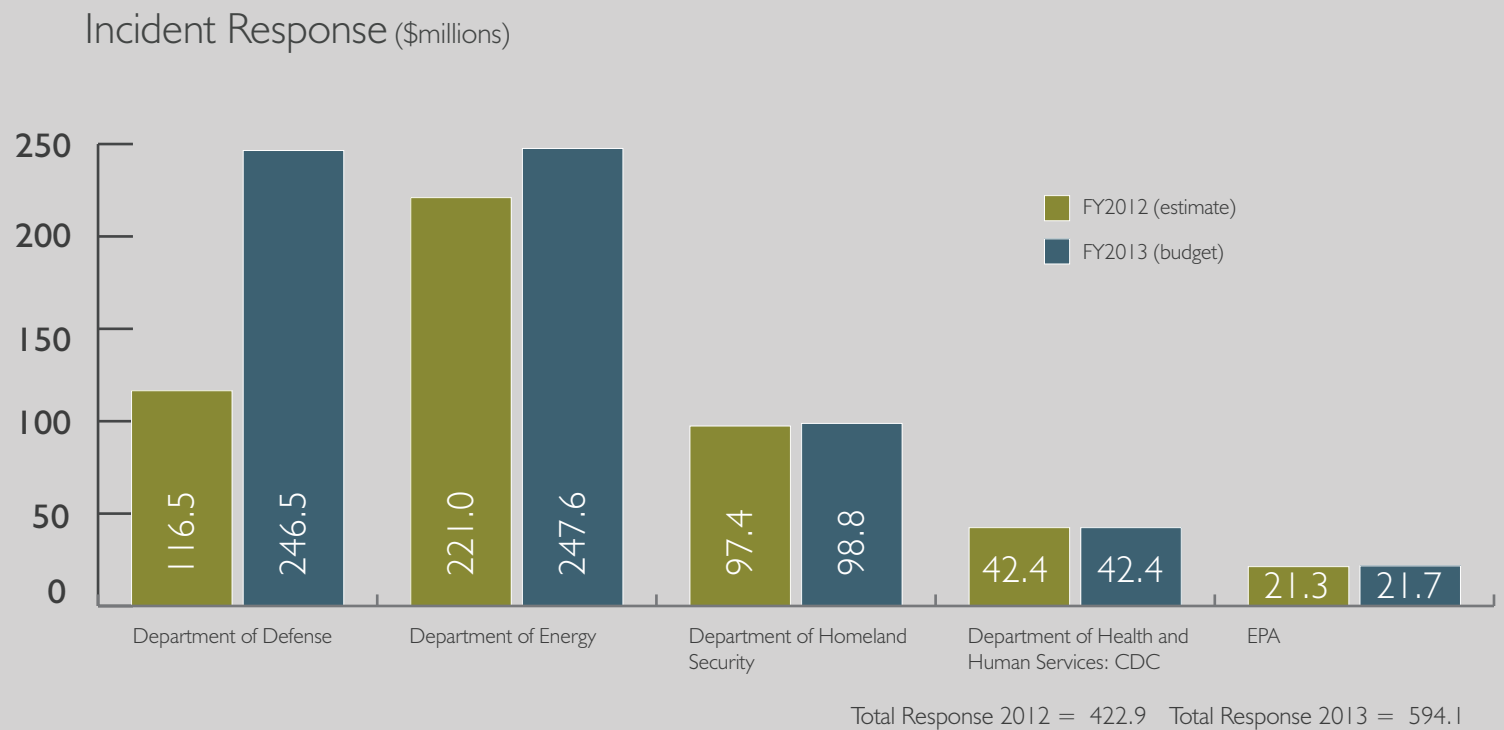
Compensating Victims After a Catastrophic Nuclear Disaster

After studying Japan's experience with victims' compensation following the Fukushima disaster, the Center analyzed US victims' compensation programs to evaluate their sufficiency and effectiveness following a similar type of nuclear power plant disaster.

Our study identified limitations in the US nuclear utility liability program and recommended actions that could be taken to better position the nation in its response to such a disaster. Under the 1957 Price-Anderson Act, nuclear power utilities collectively provide liability insurance up to \$12.6 billion to compensate victims of a nuclear plant disaster. That amount sounds sizable until it is compared with the \$143 billion that is expected to be paid to victims of the 2011 Fukushima Daiichi nuclear power plant disaster.

The Center's assessment concluded that the Congress, the nuclear industry, and other stakeholders should formulate a plan for paying compensation costs that can be predicted to exceed Price-Anderson Act funds. The plan must be fair to victims and feasible for the nuclear power facilities. We also recommended that greater attention be paid now to establishing policies that support emergency preparedness, response, and recovery through all levels of government because effective policy and planning can help mitigate compensation costs.

The report documenting our analysis was titled "The Price-Anderson Act and the Role of Congress in Compensating Victims After a Catastrophic Nuclear Disaster."



Federal Funding Analysis of Nuclear Consequence Management Programs: FY2012-FY2013

President Obama has publicly stated that the risk of nuclear attack has risen even as the risk of a nuclear confrontation between nations has decreased. National efforts to prevent nuclear terrorism are critical, but if they fail, we must be prepared to manage the consequences. Beginning this year, in an effort to understand and delineate the government approach to this issue, the Center has been tracking federal funding for nuclear consequence management. Results were published in the December 2012 *Biosecurity and Bioterrorism* article, “Funding for Nuclear Consequence Management-related Programs: FY2012-FY2013.”

In that report, we quantified US resources for all publicly identified programs that have nuclear consequence management as part of their program descriptions, titles, or missions. The major finding of this study was that for fiscal year 2012, the appropriation for US nuclear consequence management programs totaled \$741.2 million, which amounts to slightly more than 1% of the estimated \$52 billion total for US nuclear weapons–related funding. Funding for nuclear consequence management has remained essentially unchanged since FY2008, when it was estimated to be \$700 million.

PROFESSIONAL ACTIVITIES

Selected Publications

The Price-Anderson Act and the Role of Congress in Compensating Victims After a Catastrophic Nuclear Disaster. Morhard R and Ravi S. *Biosecurity and Bioterrorism*. 2012;10(4):340-345.

Funding for Nuclear Consequence Management-related Programs: FY2012-FY2013.” Sell TK and Franco C. *Biosecurity and Bioterrorism*. 2012;10(4):417-419.

Radiological Disasters: What’s the Difference? Sell TK and Gilles K. *Biosecurity and Bioterrorism*. 2012;10(4):412-416.

Selected Presentations

6th Annual Emergency Management Summit. Baltimore, MD. “The Rad Resilient City Checklist: A Life-Saving Preparedness Tool for Nuclear Terrorism.”

American Red Cross Day at the White House. Washington, DC. “Building Resilient Communities by Creating Community Networks.”

Institute of Medicine, Nationwide Response Issues After an Improvised Nuclear Device Attack: Medical and Public Health Considerations for Neighboring Jurisdictions Workshop. Washington, DC. “Mental Health Implications of an IND for Receiving Healthcare Systems.”

International Disaster and Risk Conference, Global Risk Forum. Davos, Switzerland. “Reconstituting Community in the Aftermath of Nuclear Terrorism Poster.”

International EMS/Disaster Management Conference and Exhibition—Kuwait 2013. Kuwait City, Kuwait. “Public Health Preparedness in a Nuclear Disaster Event.”

Selected Advisory Board, Scientific, Community, and Task Force Memberships

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



Building and Supporting the Professional Community



Nicholas Kelly, Emerging Leaders in Biosecurity 2012 Fellow, and Philip K. Russell, MD, Major General (ret), USA, former director of the Office of Research and Development Coordination, ASPR, HHS.





Emerging Leaders in Biosecurity Initiative

The Center created the Emerging Leaders in Biosecurity Initiative (ELBI) to identify and foster the next generation of highly capable professionals in the broad and diverse field of biosecurity. Biosecurity policies and programs in US government agencies (federal, state, and local), the private sector, and other countries will require the continued infusion of talented people to keep up with the challenges posed by changing biological threats.

The first class of Emerging Leaders fellows was selected by the Center in April 2012, and the inaugural year's activities provided fellows with many opportunities to meet and work with senior leaders in the field. Through formal and informal events and discussions, fellows were offered a behind-the-scenes introduction to the ways in which science and policy shape practice, the importance of interdisciplinary teamwork, and the necessity of international cooperation and collaboration.

In autumn 2012, fellows were invited to submit original essays for a writing competition, with winners chosen to present their papers at the autumn meeting in San Francisco. Fellows focused on offering practical solutions to problems in biosecurity. During their time in San Francisco, fellows were introduced to a range of senior leaders and were invited to tour the Lawrence Livermore National Laboratory, where they met with early career and senior scientists. In their meeting with the Honorable Andy Weber, Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs, the fellows learned of Weber's perspective on the emerging threat posed by bioagents.

The second class of fellows for 2013 has been selected, and a number of activities and meetings are planned, including interaction between the fellows and the members of the Executive Steering Committee for the Initiative, as well as alumni from the class of 2012.

BIOSECURITY AND BIOTERRORISM

BIODEFENSE STRATEGY, PRACTICE, AND SCIENCE

Tom Inglesby and D. A. Henderson are Coeditors-in-Chief of the journal, the only peer-reviewed journal dedicated exclusively to issues of biosecurity, preparedness, and response to threats to health. The journal, now in its 11th year of publication, has steadily grown in the breadth of its authors, readers, and subject matter since it was launched in 2003.

The journal's impact factor increased by 54% in the latest ranking, making it one of the top 10 journals in international relations and ranking it in the top third of public health journals. And 100% of its subscribers

renewed for the 2013 volume year, with an additional 10% increase in new subscribers. The journal also experienced a 10% increase in full-text article downloads of its website content.

More than a third of the journal's subscribers are from outside the US, with a wide international audience of individual and institutional subscribers in Europe, Asia, Canada, Australia, South America, Europe, and India and more than 650 libraries in China. The majority of online users are from libraries of major US and international academic institutions and government agencies.

Highlights from *Biosecurity and Bioterrorism*, 2012-2013

“Shelf-life Extension Program (SLEP) as a Significant Contributor to Strategic National Stockpile Maintenance: The Israeli Experience with Ciprofloxacin.” Moran Bodas, Landschaft Yuval, Ron Zadok, Zippora Hess, Batya Haran, Mimi Kaplan, and Arik Eisenkraft

“Biosecurity Measures in 48 Isolation Facilities Managing Highly Infectious Diseases.” Vincenzo Puro, Francesco M. Fusco, Stefan Schilling, Gail Thomson, Giuseppina De Iaco, Philippe Brouqui, Helena C. Maltezou, Barbara Bannister, René Gottschalk, Hans-Rheinhard Brodt, and Giuseppe Ippolito

“Is H5N1 Really Highly Lethal?” Eric S. Toner and Amesh A. Adalja

“Biosecurity and the Review and Publication of Dual-Use Research of Concern.” Daniel Patrone, David Resnik, and Lisa Chin

“How the FDA Food Safety Modernization Act Responds to Terrorism Threats: A Primer.” James William Woodlee

“The Globalization of US Medical Countermeasure Production and Its Implications for National Security.” Amesh A. Adalja, Samuel B. Wollner, Thomas V. Inglesby, and George Poste

“Perspective: Consequences and Countermeasures in a Nuclear Power Accident: Chernobyl Experience.” Vladimir A. Kirichenko, Alexander V. Kirichenko, and Day E. Werts

“Medical Planning and Response for a Nuclear Detonation: A Practical Guide.” C. Norman Coleman, et al.

“Emergency Use Authorization: Regulatory Challenges from the 2009 H1N1 Influenza Pandemic in Japan.” Hisashi Urushihara, Sayako Matsui, and Koji Kawakami

“How to Communicate with the Public about Chemical, Biological, Radiological, or Nuclear Terrorism: A Systematic Review of the Literature.” G. James Rubin, Alex Chowdhury, and Richard Amlôt

“Establishing a National Biological Laboratory Safety and Security Monitoring Program.” James W. Blaine

“Public Response to an Anthrax Attack: A Multiethnic Perspective.” Gillian K. SteelFisher, Robert Blendon, Amanda Brule, Fran N. Ben-Porath, Laura J. Ross, and Bret Atkins

“Guidelines for Biosafety Training Programs for Workers Assigned to BSL-3 Research Laboratories.” Lesley C. Homer, T. Scott Alderman, Heather Ann Blair, et al.

“Biosurveillance in Outbreak Investigations.” S. Cornelia Kaydos-Daniels, Lucia Rojas Smith, and Tonya R. Farris

“Assessment of Medical Reserve Corps Volunteers’ Emergency Response Willingness Using a Threat- and Efficacy-Based Model.” Nicole A. Errett, Daniel J. Barnett, Carol B. Thompson, Rob Tosatto, Brad Austin, Samuel Schaffzin, Armin Ansari, Natalie L. Semon, Ran D. Balicer, and Jonathan M. Links

“The Importance of Establishing a National Health Security Preparedness Index.” John R. Lumpkin, Yoon K. Miller, Tom Inglesby, Jonathan M. Links, Angela T. Schwartz, Catherine C. Slemper, Robert L. Burhans, James Blumenstock, and Ali S. Khan

“Exploring Communication, Trust in Government, and Vaccine Intention Later in the 2009 H1N1 Pandemic: Results of a National Survey.” Sandra Crouse Quinn, John Parmer, Vicki S. Freimuth, Karen M. Hilyard, Donald Musa, and Kevin H. Kim

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Websites

The Center maintains 5 websites. Our main site addresses issues of health security and provides visitors with free and open access to Center reports, publications, events, and Congressional testimony, with an archive that extends forward from the inception of the Center in 1998.

The other 4 sites are subject-matter specific: Emerging Leaders in Biosecurity Initiative, Rad Resilient City Initiative, Infectious Diseases Cost Calculator, and Clinicians' Biosecurity News. Over the past year, the sites collectively had close to 200,000 visitors (mostly from the US, Canada, India, and Australia) and more than 400,000 page views.



Social Media

The Center plays a critical role in informing government, practitioners, and the public of important issues in health security. We have a growing social media footprint on Twitter, Facebook, LinkedIn, and YouTube, which help keep us at the forefront of health security-related discussions and events.

The Center's Twitter account has become a prominent voice in the social media coverage of health security for more than 1,200 followers. We offer regular commentary on novel H7N9 influenza and other prominent outbreaks; on national security events, such as the ricin letters sent to government officials; and global health security issues, such as the reported chemical weapons attacks in Syria. Through Twitter, the Center relays important messages about breaking events, our work, and other critical communications.

We use our YouTube channel to make widely available our series of issue-focused video briefs and the talks from our conferences. In the past year, our videos have been viewed thousands of times.

UPMC
CENTRAL
HOSPITAL

A person wearing a white lab coat is seated at a desk, viewed from the side. A computer monitor is visible on the desk. The background is a plain, light-colored wall.

**ENTER FOR
HEALTH SECURITY**



Tom Inglesby, MD, CEO and Director

Since becoming Director in 2009, Dr. Inglesby has expanded and deepened the Center's expertise on public health threats, while also establishing new Center initiatives to build US preparedness for and resilience to emerging infectious diseases, natural disasters, nuclear terrorism, and nuclear accidents.

Dr. Inglesby is Chair of the Board of Scientific Counselors, Office of Public Health Preparedness and Response, of the US Centers for Disease Control and Prevention. He has been chair or a member of a number of National Academy of Sciences committees and has served in an advisory capacity to the Defense Science Board, the Departments of Health and Human Services and Homeland Security, and the National Institutes of

Health. He 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 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. He continues to see patients in a weekly HIV clinic.



Anita Cicero, JD, COO and Deputy Director

Working with the Center's CEO, Ms. Cicero directs operations, strategic and budget planning, and program development. Since joining the Center, she has strengthened the Center's efforts in epidemic preparedness, nuclear resilience, and international programs, including collaborative efforts in China, Taiwan, and Kuwait.

Before joining the Center, Ms. Cicero spent nearly 2 decades as a practicing attorney in both the US federal government and the private sector. She was 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. In her legal work, she created and managed a number of pharmaceutical

consortia, with a particular focus on clinical research and regulatory compliance. Ms. Cicero's work required constructive engagement with members of Congress, the World Health Organization, the European Commission, the US Food and Drug Administration, the US Departments of State, Defense, and Health and Human Services, and the Environmental Protection Agency. Before entering private practice, Ms. Cicero focused on environmental litigation and counseling. She started her career as a trial attorney in the Honors Program at the US Department of Justice, Environmental Enforcement Section.

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



D. A. Henderson, MD, MPH, Distinguished Scholar

Dr. Henderson is a Professor of Public Health and Medicine at the University of Pittsburgh, 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 is a member of 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 graduated from Oberlin College, the University of Rochester School of Medicine, and the Johns Hopkins School of Hygiene and Public Health.



Contributing Scholars

Clockwise from top left: Fred Selck,
Randy Larsen, Dan Hanfling,
Richard Waldhorn, Joseph Fitzgerald





Senior Associates, Associates, Analysts

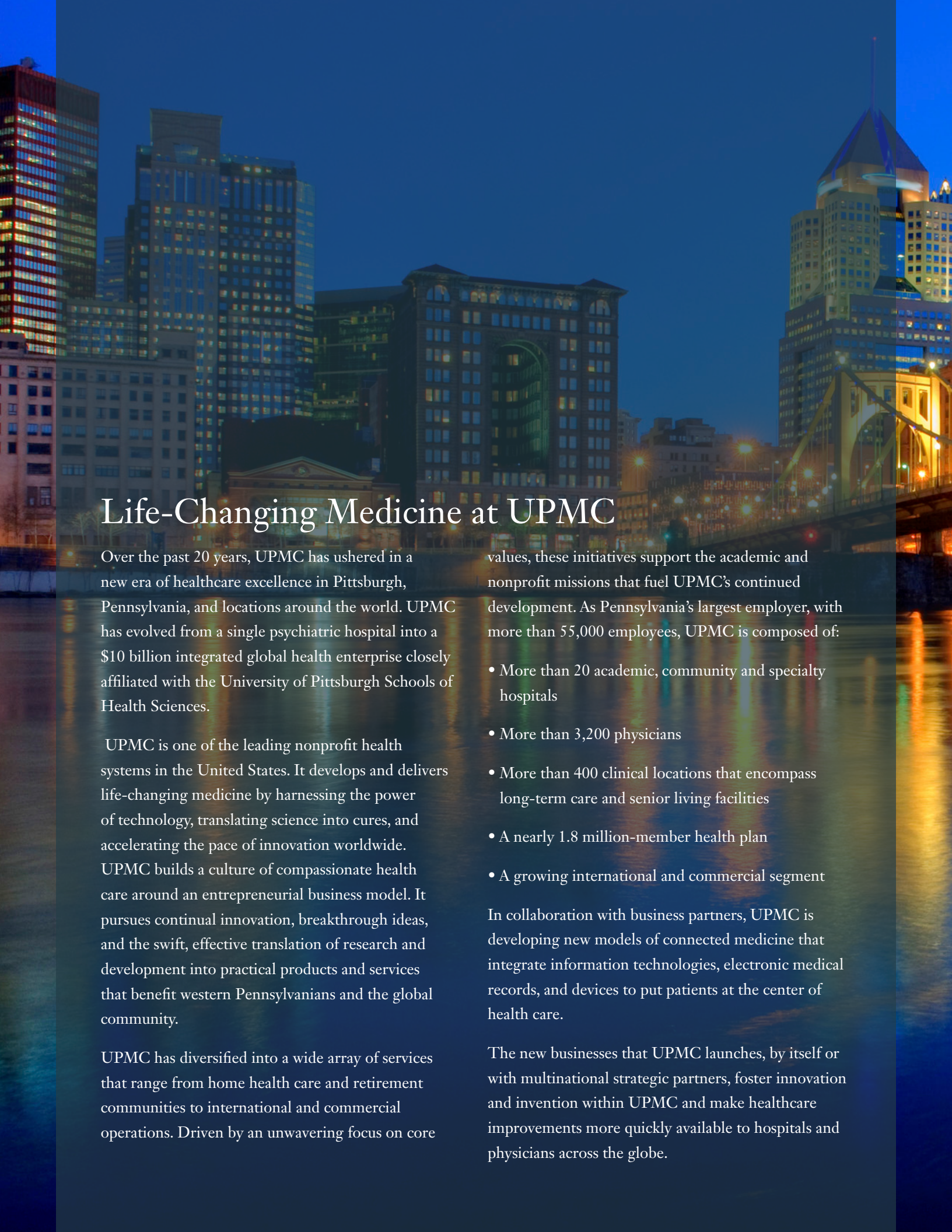
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Senior & Support Staff

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Life-Changing Medicine at UPMC

Over the past 20 years, UPMC has ushered in a new era of healthcare excellence in Pittsburgh, Pennsylvania, and locations around the world. UPMC has evolved from a single psychiatric hospital into a \$10 billion integrated global health enterprise closely affiliated with the University of Pittsburgh Schools of Health Sciences.

UPMC is one of the leading nonprofit health systems in the United States. It develops and delivers life-changing medicine by harnessing the power of technology, translating science into cures, and accelerating the pace of innovation worldwide. UPMC builds a culture of compassionate health care around an entrepreneurial business model. It pursues continual innovation, breakthrough ideas, and the swift, effective translation of research and development into practical products and services that benefit western Pennsylvanians and the global community.

UPMC has diversified into a wide array of services that range from home health care and retirement communities to international and commercial operations. Driven by an unwavering focus on core

values, these initiatives support the academic and nonprofit missions that fuel UPMC's continued development. As Pennsylvania's largest employer, with more than 55,000 employees, UPMC is composed of:

- More than 20 academic, community and specialty hospitals
- More than 3,200 physicians
- More than 400 clinical locations that encompass long-term care and senior living facilities
- A nearly 1.8 million-member health plan
- A growing international and commercial segment

In collaboration with business partners, UPMC is developing new models of connected medicine that integrate information technologies, electronic medical records, and devices to put patients at the center of health care.

The new businesses that UPMC launches, by itself or with multinational strategic partners, foster innovation and invention within UPMC and make healthcare improvements more quickly available to hospitals and physicians across the globe.



Credits

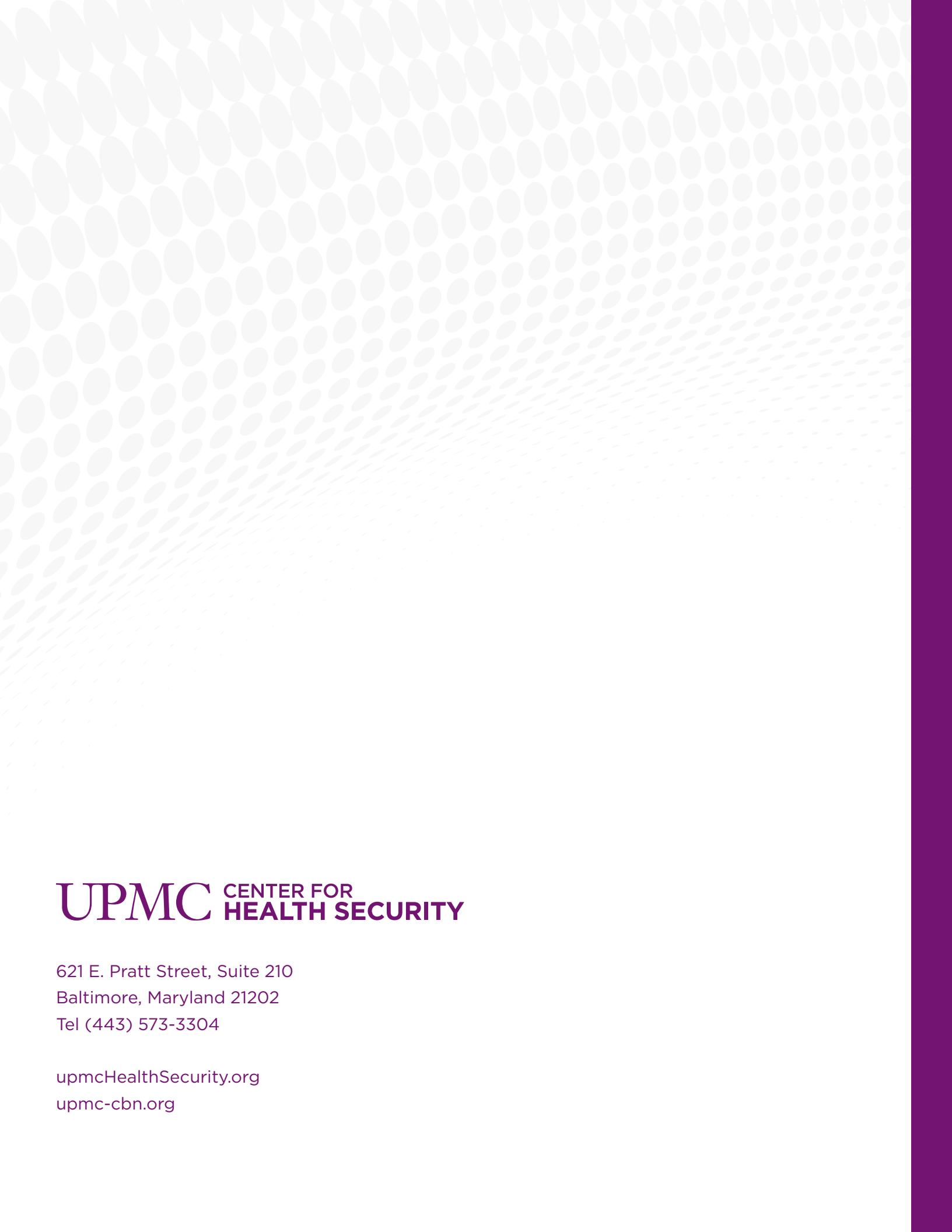
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