

# Bio-Training



**Black Swans –  
Preparing for Pandemic & Biological Threats**  
By Robert C. Hutchinson, Public Health

**Needed: More Biothreat  
Training for First Responders**  
By Steven P. Bucci & Jennifer Corrente-Bucci, Viewpoint

**Redirecting Dual-Use Research Regulations**  
By Courtney Gavitt, Standards

**Emergency Management &  
Public Health: Partners in Preparedness**  
By Kay C. Goss, Emergency Management

**Training & Protecting  
The First On-Scene Responders**  
By Richard Schoeberl, Fire/HazMat

**A Unified Strategy for Biodefense Preparedness**  
By Patrick Rose, Public Health

**Protecting Life & Civil Liberties –  
Masters of Collaboration**  
By Charles J. Guddemi, Special Events

**NamUs: Narrowing the Search for Missing Persons**  
By Joseph Cahill, Law Enforcement

**Intelligent Accountability –  
Being Prepared for the Unthinkable**  
By Susan Collins, Interviews

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## Business Office

517 Benfield Road, Suite 303  
Severna Park, MD 21146 USA  
www.DomesticPreparedness.com  
(410) 518-6900

## Staff

Martin Masiuk  
Founder & Publisher  
mmasuk@domprep.com

Susan Collins  
Associate Publisher  
scollins@domprep.com

James D. Hessman  
Editor in Chief  
JamesD@domprep.com

Catherine Feinman  
Editor  
cfeinman@domprep.com

Judith Lawless  
Director of Corporate Development  
lawless@plcouncil.org

Carole Parker  
Business Development Manager  
cparker@domprep.com

John Morton  
Senior Strategic Advisor  
jmorton@domprep.com

David Van Gasbeck  
Strategic Advisor  
vangasbeck@plcouncil.org

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## Editor's Notes

By James D. Hessman



Biological agents – plague, smallpox, anthrax, ricin, and others – that are naturally occurring have caused many deaths throughout history. Unfortunately, people who wish to inflict harm on others have used, and will continue to use, those same agents as weapons of mass destruction. Emergency planners, responders, and receivers must be prepared for both naturally occurring and intentional biological threats by having effective “Bio-Training.”

The professionals featured in this month's printable issue of DPJ focus special attention on: (a) the dangers posed by deadly pathogens that can now be created, and re-created, by scientists or would-be terrorists; (b) the costly and continued research required to detect, defeat, and destroy these emerging diseases; (c) the personnel and material resources needed to carry out that research; and (d) the essential role played not only by local, state, and federal government agencies but also by a broad spectrum of international agencies and organizations as well as the private sector.

Robert C. Hutchinson starts the collective discussion with a timely report on the usually unintentional but sometimes deliberate spread of killer diseases by unsuspecting, yet infected, carriers of pathogens released during a low-probability/high-consequence incident. Courtney Gavitt focuses on the scientific research needed to detect and destroy such diseases – and warns that scientists can use the same research efforts (and funding) to create pathogens that are even more malignant. And Kay C. Goss emphasizes the importance of emergency managers collaborating more effectively with public health professionals to prepare for many disasters that threaten the nation.

On the operational front, Steven P. Bucci and Jennifer Corrente-Bucci focus on training – not only of scientists but also, and more specifically, of the first responders on the scene whose job it is to detect and, if possible, defeat a potentially fatal new disease. Richard Schoeberl focuses attention on the parallel need not only for training but also for the personal protective equipment needed to ensure that the responders themselves do not become victims as well. Patrick Rose looks at the political side of the problem and concludes that the only viable solution – if there is one – to what is now a threat to all nations is a unified international strategy and a truly global approach leading to a potential solution.

Susan Collins shares a podcast interview with practitioners who discuss the importance of tracking and credentialing first responders, and the intelligent accountability systems that enable such capability. Charles J. Guddemi and Joseph Cahill round out the issue with informative commentaries on, respectively: (a) the U.S. Park Police, and that organization's protective role in a broad spectrum of special event programs and projects throughout the nation; and (b) the development and use of the “NamUs” research tool now being used by police departments, law offices, anxious relatives, and private citizens to search for (and often find) individual citizens who, in one way or another, have disappeared without warning, without cause, and possibly without any plausible explanation.

*About the Cover: Decontamination of people (iStock photo). Decontamination is a team effort involving responders who are adequately trained and equipped to handle incidents involving various biological, chemical, or radiological agents.*

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## DomPrep Writers

Raphael M. Barishansky  
Public Health

Joseph Cahill  
EMS

Craig DeAtley  
Public Health

Kay C. Goss  
Emergency Management

Stephen Grainer  
Fire/HazMat

Rodrigo (Roddy) Moscoso  
Law Enforcement

Corey Ranslem  
Coast Guard

Glen Rudner  
Fire/HazMat

Richard Schoeberl  
Law Enforcement

Dennis R. Schrader  
CIP-R

Joseph Trindal  
Law Enforcement

# Black Swans – Preparing for Pandemic & Biological Threats

By Robert C. Hutchinson, Public Health

In his 2007 best-selling book “The Black Swan: The Impact of the Highly Improbable,” Nassim Nicholas Taleb, a Lebanese American statistician, described a [Black Swan](#) event as a highly improbable event with three principal characteristics. “It is unpredictable; it carries a massive impact; and, after the fact, we concoct an explanation that makes it appear less random, and more predictable, than it was.”

It is difficult to argue with Taleb’s assessment. Humans have certain psychological limitations preventing them from foreseeing such events. Even a significant incident or disaster that seems reasonably predictable can still have an element of surprise when the threat is ignored for one or more reasons – limited resources, for example, or competing priorities, wishful thinking, or even willful blindness. In addition, many significant events often seem obvious and/or expected – *after* they occur.

All of which raise a very important question for the scientific community: Is a future novel pandemic illness, or biological threat, actually a Black Swan event that was not recognized as such until after a major eruption and/or severe international impact? There may be no definitive answer to that question, but the question itself is at least plausible. Pandemics are certainly not new, and have been the subject of many best-selling books and movies, in large part because of their possible real-life consequences. The 2011 movie “Contagion,” for example, sparked numerous conversations, unfortunately rather short-lived, that focused on: (a) the level of national awareness and preparedness for a possible pandemic illness; and (b) the serious and cascading consequences that might occur in any nation not properly prepared to deal with an emerging novel virus or biological attack.

As with many other homeland security and law enforcement concerns, the interest in this low-probability but high-consequence threat faded from the national discourse – in the United States, at least – when, and because, more pressing issues demanded the limited time and resources of the nation’s emergency planners and public health professionals. Nevertheless, the possibility of suddenly identifying a highly pathogenic virus has not diminished. Moreover, most communities probably have not adequately prepared to deal with such an event, even under the umbrella of all-hazards or whole-of-community planning.

In 2012, the identification of a novel coronavirus – now known as Middle East Respiratory Syndrome ([MERS](#)) – raised new concerns about another viral respiratory illness that, it was feared, could evolve into the next Severe Acute Respiratory Syndrome ([SARS](#)) or even worse. Not quite half (63) of the first 149 cases reported died after being infected. Most of the

fatalities occurred in Saudi Arabia, but cases in the United Kingdom have confirmed human-to-human [transmission](#). In July 2013, to prevent further spread of the disease, the World Health Organization established an [emergency committee](#) to effectively monitor this still-emerging virus.

A quick identification of the new coronavirus, particularly if encountered in other nations, will help facilitate its containment and timely typing to institute the appropriate responses and medical countermeasures. A major U.S. concern is the possibility that the new virus could reach the same level of human-to-human transmission experienced during the SARS outbreak.

### **Serious Impacts Both Overseas & in the United States**

Recurring events around the world involving mass illnesses and/or deaths in domesticated animal populations, especially those linked to viruses – including influenza – raise serious concern even within the United States. The March 2013 discovery of approximately 15,000 pig carcasses floating down a river in China, for example, caused public health officials throughout the entire world to wonder if it might be another indicator of a still emerging threat. Beyond the cause of death from a reported circovirus found in the pigs tested, there are serious ramifications of any novel or evolved microbes widely spreading to other locations both within China itself and in neighboring countries, especially with the current H7N9 virus threat. In China, ducks and swans were among the additional die-offs in that nation's other animal populations. These events strongly reinforce lingering epidemic or pandemic concerns – including possible viral reassortment or mutations that today could swiftly travel around the world via the wings of birds, aboard containerships, and/or on commercial aircraft.

The impact of a serious pandemic influenza could be far greater than that caused by a conventional terrorist attack or an act of war. In its October 2011 [Bio-Response Report Card](#), the Bipartisan WMD Terrorism Research Center, a U.S. nonprofit organization co-chaired by two former U.S. Senators – Bob Graham (D-Fla.) and Jim Talent (R-Tenn.) – pointed out that an H1N1 influenza virus strain, known as the Spanish Flu, killed an estimated 20 million people worldwide during the winter of 1918-1919. During that winter, the Report Card



stated that, “more U.S. soldiers died from influenza than had died on World War I battlefields.”

If the novel coronavirus MERS, the [H7N9](#) influenza, or any other serious pathogen were to be identified in the United States, it would trigger a response in many of the nation's critical sectors, especially in such fields as medical services, public health, and law enforcement. It also would severely test the nation's current medical-detection and surge-capacity capabilities – to a level that at least some officials believe may demonstrate insufficient planning and preparedness in today's all-hazards environment.

In that situation, one of the first and most important lines of defense, and of possible failure points, would be the initial screening and identification of the virus as early as possible – i.e., in time to implement the pre-designated quarantine and isolation procedures and practices needed to contain the spread of the virus. Containment, if possible, would be the most effective way to assess and control further exposure of any emerging threat. That conclusion implies at least two questions that any of the organizations involved – especially law enforcement and public health agencies – must ask themselves: (a) Are the current law enforcement and public health communities adequately prepared to mandate and to enforce federal- or state-ordered quarantine or isolation procedures – with little or no notice – at a border, medical facility, screening location, or city limit? (b) Do the nation's law enforcement and public health agencies have in place the comprehensive plans and resources needed to support this infrequently exercised mission?

## Plans, Strategies & Other Applications

For those not directly involved in this field or area of interest, this topic may be unfamiliar and seemingly irrelevant insofar as their day-to-day duties and priorities are concerned. Too many citizens may view an emerging biological threat solely (and inaccurately) as a federal responsibility to interdict and contain at an international border. It is true, of course, that there already are several national strategy plans in place to assist in the framing and assignment of responsibilities for an obligation shared by all levels of government and by the private sector.

Among the most important examples of these plans are: (a) The White House's National Strategy for Pandemic Influenza (2005) and National Strategy for Pandemic Influenza – Implementation Plan (2006); and (b) the U.S. Department of Health and Human Services' (HHS) Pandemic Influenza Plan (2005). Individually and collectively, these documents spell out in specific detail how the nation as a whole should prepare for, detect, and respond to a potential pandemic threat, particularly influenza. Following are selected excerpts from each of those documents.

*The 2005 National Strategy for Pandemic Influenza* identifies three pillars for the national strategy, the third of which focuses on Response and Containment: “Actions to limit the spread of the outbreak and to mitigate the health, social, and economic impacts of a pandemic; and, where appropriate, use governmental authorities to limit non-essential movement of people, goods, and services into and out of areas where an outbreak occurs.”

*The 2006 National Strategy for Pandemic Influenza – Implementation Plan* begins with the following prologue to frame the threat and explain the need for the involvement of all levels of government and private citizens as well: “In the last century, three influenza pandemics have swept the globe. In 1918, the first pandemic (sometimes referred to as the ‘Spanish Flu’) killed over 500,000 Americans and more than 20 million people worldwide. One-third of the U.S. population was infected, and average life expectancy was reduced by 13 years. Pandemics in 1957 and 1968 killed tens of thousands of Americans and millions across the world.”

*The 2006 Implementation Plan* also identifies numerous key considerations such as delaying pandemics, screening procedures, and other proactive measures (covered in the Transportation and Borders chapter) and law enforcement responses that should be considered during outbreaks, quarantines, and other movement restrictions (in the Law Enforcement, Public Safety, and Security chapter). The numerous and detailed topics covered in these national strategies confirm the truism that all incidents begin and end locally.

*The 2005 HHS Pandemic Influenza Plan* asserts that state, local, and tribal agencies should, if needed, help enforce community containment measures: “In extreme circumstances, public health officials may consider the use of widespread or community-wide quarantine, which is the most stringent and restrictive containment measure.” There are at least two reasons for that strong mandate: (a) The orders given may involve a legally enforceable action; and (b) A quarantine restricts travel into or out of an area circumscribed by a real or virtual *cordon sanitaire* (sanitary barrier), except for authorized persons, which include public health or healthcare workers. The HHS plan also confirms the need for law enforcement agencies to maintain security at U.S. borders and to enforce movement restrictions during widespread community quarantine, including establishment of the *cordon sanitaire*.

These pandemic strategies acknowledge that there are in fact several unique challenges that state, local, and tribal organizations would encounter during a pandemic illness that require: (a) expanded mutual aid between and among those various jurisdictions; and/or (b) assistance from the federal government. Primarily for that reason, the national documents encourage governmental agencies to formulate truly comprehensive pandemic response plans as well as to plan and carry out the training required for the effective execution of those plans.

There are a number of other applicable federal strategies, plans, and policy guidance documents that should be taken into consideration by policy makers at all levels when developing a thorough and actionable plan to cope with a pandemic threat. Among the most important of those documents are the following:

- President Obama’s 2011 Presidential Policy Directive 8 ([PPD-8](#));
- The Public Health Service Act ([PHSA](#)) updated by Congress in March 2013;
- The U.S. Department of Homeland Security’s 2008 National Incident Management System ([NIMS](#)); National Response Framework ([NRF](#)), updated in May 2013; 2013 [National Preparedness Report](#); Robert T. Stafford Disaster Relief and Emergency Assistance Act ([Stafford Act](#)), updated in April 2013; and
- The U.S. Department of Justice’s 1984 Emergency Federal Law Enforcement Assistance Program ([EFLEA](#)).

The EFLEA program is an option for obtaining certain federal law enforcement resources but, depending on the current appropriations level, supplemental funding may be needed to execute various complex or prolonged missions that might be authorized. The Stafford Act gives the federal government the authority to provide additional funding or other national resources through an annually funded mechanism. Exercising that authority, though, requires an approved presidential declaration. Mission support funded by the Stafford Act would be coordinated through the NRF’s Emergency Support Functions process. The PHSA provides the federal authority needed to prevent the entry and spread of communicable diseases from foreign countries into the United States and/or between states.

In addition to the general authority and possible funding sources listed above, federal law also identifies the federal officials specifically responsible for certain enforcement and quarantine activities during a public health emergency. The officials possessing the authority, and in some instances specifically mandated, to enforce federal and state quarantines are identified in the 2006 Implementation Plan and in other federal

statutes – for example, [42 U.S.C. 97](#) (State Health Laws Observed by United States Officers), in effect as of 1 February 2010; and [42 U.S.C. 268](#) (Quarantine Duties of Consular and Other Officers), in effect as of 7 January 2011.

Public health and law enforcement officials must clearly recognize, though, that it is particularly important to identify and understand both: (a) the different authorities needed for the assistance requested; and (b) the appropriate method that must be followed for obtaining support (if available). The enforcement of quarantines is not limited

to any one level of government; nor can a single agency successfully execute it without cooperation, coordination, and collaboration with diverse public and private organizations.

The nation’s state and local governments have a long history of using quarantines to contain emerging pathogens. For example, government agencies used quarantines during an 1878 yellow fever epidemic in the Memphis, Tennessee, area; and a 1916 poliomyelitis (polio) outbreak in various areas of New York and New Jersey. During these and other outbreaks, the state and local governments directly involved found themselves in extremely challenging circumstances addressing those Black Swans. The challenges involved in

quarantine enforcement and the resolution of conflicting policies and practices are not limited to these two examples, of course, nor are they likely to be in the future.

*To prepare effectively for a “Black Swan” incident, all agencies involved must first identify the threat, then take all of the precautions and other actions required to control it before it is too late.*

### **Agency Roles During Any Response**

Agencies now must ask themselves if they: (a) have a specific role in any response dealing with a low-probability, high-consequence threat event; (b) are fully prepared for such an event; and (c) are taking into consideration the possible roles and expectations for state, local, and tribal law enforcement agencies. In a 2006 article by attorney and law enforcement consultant Charles Friend, entitled “[QUARANTINES: The Law Enforcement Role](#),” numerous important issues and



considerations were identified for state, local, and tribal law enforcement agencies to evaluate and prepare for the enforcement of quarantines during a possible pandemic illness or biological terrorist attack.

The 2006 National Strategy for Pandemic Influenza – Implementation Plan also stresses the importance of understanding the statutory framework governing a legal and effective response. Anticipating that need, the Implementation Plan includes a list of 23 actions and expectations, many of which involve state, local, and/or tribal considerations and expectations.

Because of the current financial challenges that federal, state, local, and tribal organizations are experiencing, it is unlikely that a majority of the nation’s public health and law enforcement organizations are adequately prepared, trained, and outfitted to handle a rapidly emerging threat such as a quickly expanding epidemic or pandemic illness. As with numerous other homeland security and law enforcement responsibilities, agencies may suddenly become involved in such incidents, with little or no prior notice. Of course, many of those same organizations did not anticipate their immediate response or support role following the 9/11 terrorist attacks or Hurricanes Katrina and Sandy. Therefore, they had to rely on their existing guidance, training, and resources.

A pandemic-prone virus – stemming from MERS, H1N1, H5N1, H7N9, or any other highly pathogenic strain – is often viewed as the responsibility of the public health and medical services communities. Law enforcement, military, and numerous other public and private sector agencies, however, also have critical responsibilities to carry out – usually in close coordination and collaboration with the other agencies involved. As is true of many significant incidents and disasters, there is usually very little if any time to plan and prepare when a new threat suddenly appears, rapidly expands, and eventually overwhelms medical services and public health officials. In addition, quarantine and isolation procedures may be required to contain a new disease outbreak or biological attack and, in some situations, any subsequent public unrest.

Each state has enacted its own laws, published its own regulations, and/or mandated its own procedures to provide the guidance needed on this subject, but the

question is: Are they sufficient and well understood? A review of the national strategies, recently emerging viruses, or even a Hollywood movie may hopefully encourage a reassessment of current planning and preparedness for this low-probability but high-consequence Black Swan threat. If not, a new review could help initiate valuable discussions on the subject.

The greatest takeaway of such discussions may well be to help all those participating: (a) to fully understand and acknowledge the extent of each organization’s intentions and capabilities; and (b) to plan accordingly *before* the arrival of a pandemic or other biological threat. However, history shows that many significant incidents and major disasters have occurred over the past 30 years that initially were considered to be low-probability, high-consequence threats before they actually occurred. A serious pandemic illness or biological attack could have a massive national impact, with extremely grave and cascading consequences – possibly even greater than dramatized in “Contagion” or other Hollywood epics. Waiting to fully experience a Black Swan before admitting that it already exists is by far the worst of all possible options facing decision-making officials at all levels.

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*The opinions expressed herein are solely those of the author in his individual capacity and do not necessarily represent the views of the agency, the department, or the U.S. government.*

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*Robert C. Hutchinson is a supervisory special agent with the U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement’s Homeland Security Investigations. He was previously the deputy director and acting director for the agency’s national emergency preparedness division. He has lectured internationally on this subject and advised national representatives from the Middle East and Central Asia regarding policy development. He completed his graduate degrees at the University of Delaware in public administration and Naval Postgraduate School in homeland security studies.*

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# Needed: More Biothreat Training for First Responders

By Steven P. Bucci & Jennifer Corrente-Bucci, Viewpoint



In its December 2008 “[World at Risk](#)” report, the U.S. Congress’s Commission on the Prevention of WMD Proliferation and Terrorism emphatically declared that biological weapons are the most dangerous threat the United States is facing. That report, issued by a commission led by two respected former senators – Democrat Robert “Bob” Graham and Republican James “Jim” Matthes Talent – and a score of distinguished scientists, should not have been easy to ignore; but that is exactly what the federal government has done.

The report did not arbitrarily dismiss the threats posed by nuclear and chemical weapons, but the former are very difficult to obtain, emplace, and actually use, and the nation’s first responders are reasonably well trained and equipped to deal with the latter, so the threat posed by biological weapons is still probably the worst-case scenario to deal with. For example, when movies or television shows portray a biological attack, they often evoke an overwhelming fear. Moreover, despite possessing a fairly sophisticated medical response system, U.S. citizens are still woefully underprepared, at best, to deal with a biological threat. Rather than serving as a motivator, therefore, the “fear factor” associated with biological weapons seems to have actually caused many citizens to ignore the threat – apparently hoping that it will simply go away.

## First Responders, First Line of Defense

Making the nation even more vulnerable to biological threats is the fact that many critics have called for the defunding of programs such as the federal government’s [Project BioShield](#) – largely because it cannot yet produce *perfect* results. Another complication is that there also has been a lack of biothreat training for law enforcement officers, firefighters, and even emergency medical responders, primarily because such training is: too complicated; and/or too highly science-related. These criticisms seem to ignore the fact that the nation’s

first responders are and will continue to be the first line of defense in dealing with biological attacks, just as they are in more “traditional” attack scenarios.

Although many first responders have received the extensive training needed to cope with chemical or explosive threat agents, the present system of relying on local doctors and nurses to serve as the initial “detection” screen for biological threat agents continues. This is despite the fact that, to augment and expand the current system, there is an urgent need to give other responders additional training in the signs and symptoms related to biothreat incidents.

*The entire world is vulnerable to biological attacks. The first line of defense for the United States, though, is not yet fully prepared to cope with such incidents.*

Around the world today, the biowarfare threat posed by rogue nations, terrorist groups, and individual “lone wolf” terrorists seems likely to become incrementally worse for the foreseeable future. Moreover, those seeking to develop or purchase virulent bioweapons will not hesitate to use them. In short, the threat posed by biological terrorism is today not receding. As U.S. and allied intelligence and law enforcement teams have made it more difficult for other nations (or groups) to successfully execute conventional attacks, the attackers are more likely to turn to other weapons, such as bioagents.

Obviously, current U.S. efforts to develop and improve the nation’s technological biodetection capabilities must continue and expand. Moreover, the numerous personnel working in the biowarfare field require more training. The U.S. Army Chemical School at Ft. Leonard Wood, Missouri, is the principal U.S. Department of Defense facility for training in all aspects of response to attacks involving weapons of mass destruction of any type. Such training, therefore, would probably be the best starting point for developing a viable, exportable program of instruction for not only military personnel but also for law enforcement officers, firefighters, and emergency medical technicians. The rationale is obvious: U.S. responders,

civilian as well as military, must know what to look for, how to carry out the field testing of biological agents, and – using all relevant means of detection – how to recognize patterns.

## A Race Against Time & Strain

Combating the destructive effects of bioweapons will always be a race against both time and the biological strain released. A concerted effort is now urgently needed to push the limits of education and training for the nation’s frontline defenders. Overworked emergency-room doctors should not be the only “intellectual trip wires” available to recognize and cope with a bioweapon incident. The threat is simply too great, and an enabling solution is readily available, so there is no valid reason *not* to begin mitigating this obviously major threat.

In fact, the domestic response community should reach out to the military, the nation’s public health authorities, and the scientific community, in an effort to immediately begin developing the instructions needed to expand and improve the bio-related diagnostic and response capabilities of *all* of the nation’s first responders. Each person directly involved should become a “detector” – and all members of the domestic response community

should be provided the tools and training necessary to effectively counter this most dangerous of the numerous threats now facing the nation.

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*Steven P. Bucci (pictured), Ph.D., former Green Beret, is director of the Allison Center for Foreign Policy Studies at The Heritage Foundation. He also is an adjunct professor of leadership at George Mason University and an associate professor of terrorism studies and cyber security policy at Long Island University. He serves on the advisory board of the MIT Geospatial Data Center and is an advisor to the Prince of Wales/Prince Edward Fellowship program at MIT and Harvard. He previously served as a lead consultant to IBM on cyber security policy and as a special forces commander in the U.S. Army, where he assumed the duties of military assistant to Defense Secretary Donald H. Rumsfeld. After retiring from the Army in 2005, he served as deputy assistant secretary of defense for homeland defense and defense support to civil authorities at the Pentagon, and was the primary civilian overseer of U.S. Northern Command.*

*Jennifer Corrente-Bucci is a Summa Cum Laude Graduate from Lee University in Bio-Chem. Her knowledge of the hard science concepts required to appropriately address the requirements of domestic preparedness is exceptional. Combined with her present efforts to obtain an advanced degree in Homeland Security Management, she is an outstanding resource for advancing the study of how to best ready the nation’s response forces.*

*Additional contributions to this article were made by Captain Philip S. Bucci, a U.S. Army Chemical Corps officer who graduated from both the Officer Basic and Advanced Courses at Ft. Leonard Wood. Trained to deal with chemical incidents, as well as nuclear and biological hazards, he uses his expertise to prepare other military first responders as they ready themselves for deployments both at home and overseas. He also is a skilled practitioner in incident-response operations.*

## Intelligent Accountability – Being Prepared for the Unthinkable

*DomPrep Podcast Interview by Susan Collins*

The unthinkable can happen at any time, and in any place. Being able to track and credential first responders in a timely manner against the unseen perils in today’s dangerous world can save many lives. This podcast interview provides important insights on the effective use and training of intelligent accountability systems.

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# Redirecting Dual-Use Research Regulations

By Courtney Gavitt, Standards



Working with pathogenic and toxic materials puts researchers, and their working environment, at considerable risk of harmful accidental exposure. Even beyond this explicit challenge of life science research, though, a pressing and yet unresolved national policy issue has emerged among political decision makers and scientists. Moreover, the risks posed by the potential misuse of life science research are expanding rapidly as new advances in biotechnology, genetics, and related sciences quickly outpace the regulations governing that research. Today, although life science research is essential to continued international improvements in the health and safety of human life, farm animals, agricultural products, and the environment, the security challenges associated with such research are growing as well.

Throughout history, humans have taken advantage of the dual-use nature of certain microorganisms to cause harm. The aborigines in various areas of the world used amphibian-derived toxins in poison arrows; Hannibal struck fear into the enemies of Carthage with the release of live and extremely toxic serpents; and the Mongols used plague-ridden corpses to kill thousands of enemy soldiers (and private citizens as well). Unlike those predecessors, today's modern scientists use their knowledge and skills primarily to help save human lives, not destroy them. However, the fast-paced global revolution in the life sciences of recent years has made it extremely difficult, and sometimes impossible, to prevent the abuse of important research breakthroughs. There needs to be a comprehensive and coordinated solution to preserve the benefits of life science research, while at the same time minimizing the risk of the knowledge, products, and technologies generated by that research being used to threaten public health and safety.

*Redirecting dual-use research regulations has the potential to create and foster a community of scientists who are more accountable for the national security and public health implications of the current "revolution" in the life sciences.*

## Defining Dual-Use Biotechnology

In the [2004](#) publication, "Biotechnology Research in an Age of Terrorism," the U.S. National Research Council (NRC) pointed out that dual-use biotechnology "could be misapplied to cause substantial damage to human health, agriculture, the environment, the economy, or national security." Today, of course, most technology and research has both civilian and military applications, which has led to the use of a new acronym, DURC (dual-use research of concern), to describe the potentially harmful effects of certain research. The processes and equipment involved in the development of biological weapons (BW), for example, are inherently dual-use. Moreover, the materials, methods, and technologies used for growing, recovering, concentrating, and stabilizing the materials used in biological agents also are used to produce vaccines, pharmaceuticals, and a broad spectrum of food products.

In response to concerns about the growing national security and public health implications of various DURC projects, many members of the global scientific community have stressed such important but intangible values as "academic freedom," the "open exchange of information," and the rights and privileges of "self-governance." Experience shows that, although some private and public institutions have the infrastructure and impetus to self-regulate, most of them have, so far, failed to comply with voluntary DURC regulatory guidelines. One prominent example was a [2008 evaluation](#) of institutional oversight pertaining to the U.S. NIH (National Institutes of Health) "Guidelines for Research Involving Recombinant DNA (rDNA) Molecules" that, among other things, revealed: (a) a lack of transparency; (b) the avoidance of due-process rules and regulations; and (c) noncompliance at an overwhelming majority of high-containment (biosafety levels 3 and 4) laboratories. The noncompliance problem

will almost surely expand significantly as the number of high-containment facilities grows exponentially to accommodate the worldwide increase in dual-use life science research facilities now expected.

### Existing DURC Regulations

To address the dual-use dilemma as a whole, the U.S. government has issued a number of additional policy statements since the release of the NIH Guidelines on rDNA. The most prominent and overarching of those statements – both of which were issued in 2012 – are the United States Government Policy for Oversight of Life Sciences Dual Use Research of Concern (also known as the [March 29 Policy](#)), and the United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern.

The March 29 Policy formalized a process of regular federal review of U.S. government-funded (and/or conducted) research on new treatments and diagnostics, improvements in public health and surveillance, and the enhancement of emergency preparedness and response efforts. If a project raises concern, researchers are now required to provide risk-mitigation plans. If a plan is still not adequate to justify the research, according to the March 29 Policy, the federal department and agencies may pursue one of three options: “(a) request voluntary redaction of the research publications or communications; (b) classify the research ... [or] (c) not provide or terminate research funding.” The U.S. government objective, of course, is to identify potential DURC problems at the project proposal stage and, more specifically, to control the dissemination of potentially harmful information before authorizing any research.

The March 29 Policy covers only research funded by the U.S. government; the follow-on policy mentioned above addresses institutional DURC without government affiliation. The second policy establishes uniform requirements governing the institutional oversight of certain research. Consistent with the March 29 Policy, the scope of oversight is limited to seven categories of experiments and 15 agents and toxins, as defined by the 2004 “Biotechnology Research in an Age of Terrorism” report. The same policy emphasizes that DURC-classified research should not assume a negative



connotation, but should serve as an indication that the research may warrant additional oversight in order to mitigate intentional or unintentional risks to public safety. Both policies put the researcher in a subordinate position, defending the potential value and security of research results before even achieving those results.

### Advancing Science & DURC Oversight

The 2011 DURC policies are well intentioned, but seem unlikely to deliver a substantially more secure environment in the field of life science research. However, operating under the assumption that the proliferation of dual-use research and technology poses a direct threat to U.S. national security, the regulations issued seek to prevent scientists from unintentionally transmitting information and/or any other material that could be dangerous in the hands of potential enemies. This approach begins to address the problem of technology and information transfer; however, the policies issued to date do not present a truly comprehensive solution to the dual-use dilemma.

Part of the problem is that the policies were developed reactively as a response to the avian flu (H5N1) transmission studies conducted in 2011 by research scientists Yoshihiro Kawaoka and Ron Fouchier. Their somewhat controversial work revealed the presence of a mutation that allowed the transmissibility of H5N1 between mammals and, consequently, brought to light some other biosecurity weaknesses. For example, controversy over publication of the study results

revealed significant gaps in the oversight of DURC and the nonexistence of guidance and decision-making authority associated with publication of the studies. Largely for that reason, the March 29 Policy focuses heavily on U.S. government evaluation and review of research and its usefulness in the sharing of scientific results. The policy seems to assert that, as the overseers of dual-use research, the reviewers can keep scientists – naïve of the implications of their research – from letting dangerous information fall into the wrong hands. The bureaucratic manner of framing these policies may explain the reluctance and widespread disapproval among members of the scientific community directly affected.

Instead of dictating the conduct of some of the country's most capable innovators, DURC policies should be used to put responsibility – and, therefore, the “ownership” of potential consequences – in their hands. Scientists have the expertise needed to create socially and medically beneficial technologies; conversely, though, they also have the expertise necessary to manipulate otherwise benign technologies into threatening ones. Updated DURC policies should reflect the importance of scientists' leadership and engagement in its regulation. Dual-use research is not inherently dangerous; it is, rather, the convergence of technologies and innovation that yield prohibited versus beneficial results. In accordance with this definition, no matter how quickly technology advances, scientists are (and will indefinitely remain) in control not only of research results but also of the many ways in which those results are applied.

### **The Practicality of DURC Regulations**

As demonstrated by the H5N1 transmission studies, researchers sometimes exhibit overconfidence in assessing the risks posed by their work. In August 2013, Fouchier and Erasmus Medical Center (MC), his Rotterdam-based research institution, went to court to challenge the Netherlands government's ruling that required him to obtain an export permit before submitting his research results for publication in the U.S.-based journal *Science*. Fouchier argued that his research should be considered “basic research,” which is already available in the public domain, and therefore should be exempt from the [2009 E.U. regulations](#) upon which the Netherlands had originally classified the

papers as an export. In September 2013, the Netherlands court upheld its original position and ruled that Fouchier's study, pursuing airborne transmission of a deadly virus strain as a “practical goal,” went beyond the field of basic research.

Targeted international regulations might have better directed Fouchier's research from the onset. Policy guidance should require researchers to pursue only socially or medically beneficial research objectives. Instead of creating a blueprint for a highly transmissible H5N1 virus, therefore, the guidance provided to Fouchier should have persuaded him to develop a more thorough study. Goals of that study could have been: (a) protecting mammals from any identified virus mutation with the potential to increase virulence or transmissibility; and/or (b) identifying the likelihood of naturally occurring mutations and their potential to affect mammals. By taking the research one major step further, the individual researcher would have achieved the same (and possibly additional) results, society might have benefitted from those results, and the publisher could have shared the information without creating a new and potentially very harmful risk to national security.

Of course, in conducting dual-use research, unintended and unanticipated results are not uncommon. With regulations designed to put the onus on the researcher, he or she is not only in control of any achievements of his/her DURC project, but of any harmful consequences as well. Comprehensive guidance and training on how, specifically, to address risky or potentially dangerous results should spell out, in significant detail, the responsibilities of the researcher, including but not limited to: reporting requirements; the mandatory security and review protocols; and the various publishing and dissemination restrictions and guidance involved.

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*Courtney Gavitt, MS, is an analyst at Gryphon Scientific, where she focuses on chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) consequence management in support of the Federal Emergency Management Agency. As a Nonproliferation Graduate Fellow at the Department of Energy (DOE), National Nuclear Security Administration (NNSA), she contributed to U.S. interagency export control and interdiction efforts designed to curb proliferation of CBRNE weapons and dual-use materials. She served as part of the U.S. delegation to the Proliferation Security Initiative and supported DOE's Australia Group representative. Before working at NNSA, she was a contractor at the U.S. Department of Homeland Security Customs & Border Protection. She holds an MS in biodefense from George Mason University.*

# Emergency Management & Public Health: Partners in Preparedness

By Kay C. Goss, *Emergency Management*



The nation's public health community has many parallels with the overall goals, basic concepts, models, and operational modes of the U.S. emergency management community. Using a broad spectrum of highly effective organizational and science-based tools, the public health and emergency management disciplines strive to protect the public from what is a rapidly growing spectrum of emergencies, disasters, and maladies. Both communities are multidisciplinary in their scientific bases (but public health is an older profession). Nonetheless, and despite their many common values and operational characteristics, members of the two communities have not always collaborated as smoothly and effectively as they probably should have in preparing for and responding to a number of mass emergencies.

The leading U.S. federal agencies – the U.S. Centers for Disease Control (CDC) of the U.S. Department of Health and Human Services (HHS) for public health and the Federal Emergency Management Agency (FEMA) of the Department of Homeland Security (DHS) for emergency management – work closely together and, except for a few instances, can point to continually improved results in meeting every disaster. The recognition that every disaster has at least some harmful health consequences and almost any public health problem can quickly evolve into a disaster drives this increasingly important and frequently exercised partnership.

## Standards & Capabilities

Each of the two professions has its own set of high standards. Emergency management, for example, has the Emergency Management Accreditation Program ([EMAP](#)), which assesses and accredits state and local jurisdictions, as well as higher education institutions that voluntarily undergo the process; more than half of all states and numerous local jurisdictions are now fully accredited. The National Fire Protection Association ([NFPA](#))

[1600](#) – a voluntary guide for all public, private, and nonprofit organizations in the fields of emergency management and business continuity – is a similar and widely used organization across many disciplines. Both have received special recognition from the [American National Standards Institute](#).

In 2011, to help continue and expand the nation's public health capabilities, the CDC published [Public Health Preparedness Capabilities: National Standards for State and Local Planning](#), which provides a practical guide for state and local jurisdictions to organize their work, plan their priorities, and decide what capabilities and resources they must have to build and/or sustain their mission. The capabilities guide also helps to ensure that federal preparedness funds go to the priority areas most in need within individual jurisdictions.

The public health capabilities standards guide encompasses, but is not limited to, the following: community preparedness and recovery, emergency operations coordination, emergency public information and warning, fatality management, information sharing, mass care, medical countermeasure dispensing, medical material management and distribution, medical surge, non-pharmaceutical interventions, public health laboratory testing, public health surveillance and epidemiological investigation, responder safety and health, and volunteer management.

The emergency management capabilities called for under EMAP and NFPA 1600 include the following: program management, administration and finance, laws and authorities, hazard identification, risk assessment, consequence analysis, hazard mitigation, prevention, operational planning, incident management, resource management, logistics, mutual aid, communications and warning, operations and procedures, facilities, training, exercises, evaluations, corrective action, crisis communications, and public education and information.

*Major disasters of any type raise public health concerns; and public health disasters translate directly into emergency management efforts. For that reason, there must be a more collaborative partnership between emergency managers and public health officials.*



## Other Core Components:

### Learning Centers & Training Opportunities

In August 2010, the CDC established a new iteration of the agency's Preparedness and Emergency Response Learning Centers ([PERLCs](#)), building on the program's successes and focusing on measurable results. Although the number of learning centers decreased from 27 to 14, the 14 centers remaining not only reach a collectively larger population but also provide more and better training.

Compensating for this reduction, the Pandemic and All-Hazards Preparedness Act of 2006 authorized the CDC to establish a number of preparedness research centers – officially designated as Preparedness and Emergency Response Research Centers ([PERRCs](#)) – around the country. Combined, these nine research centers and 14 learning centers jointly produce widely used training materials for local, state, and federal officials – and, by doing so, create new, better, and longer lasting partnerships between and among all of the agencies involved. In one example, the PERRCs collaborate closely and effectively with law enforcement and public

safety agencies, school systems, courts, and organizations serving vulnerable populations in order to continue to develop even more effective preparedness and emergency response processes.

At the state, tribal, and local levels, emergency management and public health mirror that national partnership even more closely through their emergency management departments or offices and the public health divisions of state and local health departments. Through the FEMA Higher Education Program, there are more than 275 colleges and universities offering degree and certificate programs in this field, many of which include courses in both emergency management and public health. Also, the FEMA Emergency Management Institute and the CDC offer classroom and online courses dealing with public health issues.

### Real-Life Examples & Resources

The federal government is not alone in its efforts. The private sector also is helping considerably on a continuing basis. For example, the National Emergency

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Management Association (NEMA), which is composed of all state and territorial emergency managers, joined with the Emergency Management Assistance Compact (EMAC) to host a webinar in the spring of 2013 focused on the umbrella topic “EMAC Planning in Support of Mississippi Public Health and Medical Response and Recovery Operations.” The principal speaker was James Craig, director for health and protection at the Mississippi State Department of Health; another high-level state official, Thomas McAllister, director of the Office of Response at the Mississippi Emergency Management Agency, introduced Craig. The webinar: (a) focused on the value of relationships between emergency management and public health/medical officials, especially regarding EMAC planning; (b) stressed the value of developing Mission Ready Packages (MRPs) to support planning for public health/medical responses; and (c) highlighted many of the medical resources that Mississippi now has at its disposal, the state’s own experiences in disasters, and the building of effective regional relationships and EMAC planning efforts.

Many other states also are involved in robust joint work on emergency management and public health missions. Following are a few examples:

- Oregon’s Center for Public Health Practice provides programs effective for communicable disease control and public health emergencies – including acute and communicable disease prevention, immunization, and health security, preparedness, and response – and works closely with county public health departments as well as local and tribal emergency services staffs.
- Oregon also has developed a health security preparedness and response program that encompasses such topics as: emergency alert systems for public health and healthcare staff; emergency risk communications toolkits; public health hazard-risk assessments; the state’s crisis-care guidelines; bioterrorism; strategic national stockpile resources; and strategic work plans.
- New York’s Department of Health has an overarching slogan – AWARE, PREPARE – and sponsors a broad spectrum of outreach and partnership programs throughout the state.

The true test of health emergency preparedness planning, of course, is how, and how well, healthcare professionals in private practice, hospitals, or emergency medical services (EMS) respond to and recover from a disaster. New York Health’s website is packed with emergency preparedness fact sheets, tools, and other instructional and educational resources specifically written for healthcare professionals. These resources can optimize local responses to the public health emergencies, whatever their causes, but specifically include: biological, chemical, and radiological emergencies; [hospital/EMS preparedness](#); and [maternal and child-health providers](#). New York also sponsors a [ServNY](#) registry of healthcare and mental health professionals who are willing to volunteer during an emergency or major disaster.

Many additional resources are available to help emergency managers and public health officials collaborate more often and more effectively. Some examples of those resources include:

- Office of the Assistant Secretary for Preparedness and Response ([ASPR](#))
- Oregon Coalition of Local Health Officials ([CLHO](#)), Preparedness Committee
- Social Media For Emergency Management ([#SMEM](#))
- CDC Crisis and Emergency Risk Communication ([CERC](#))
- National Public Health Information Coalition ([NPHIC](#))
- Oregon’s [Public Health Law in Emergencies](#)
- The Portland, Oregon, [Cities Readiness Initiative: Preparing Together Discussion Guide and Toolkit](#)

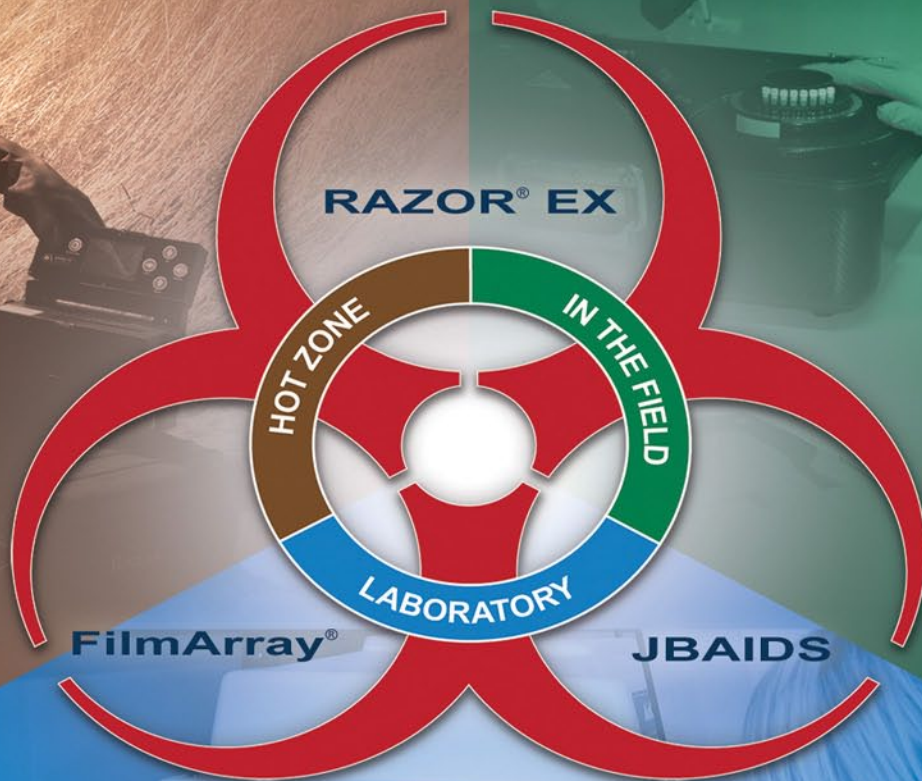
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*Kay C. Goss, CEM, is the founding president and CEO for World Disaster Management, president of the Foundation for Higher Education Accreditation in Emergency Management, first vice president of the International Network of Women in Emergency Management, and vice president of the Every Child Is Ours Foundation. She also founded the FEMA Higher Education Program and serves as adjunct faculty at Istanbul Technical University in Turkey and at the University of Nevada, Las Vegas. She previously served as Associate FEMA director in charge of national preparedness, training, and exercises for President William J. Clinton – and for 10 years was his Senior Assistant, in the Arkansas Governor’s Office, for Intergovernmental Relations. She also served as a member of the Virginia Commonwealth Preparedness Panel under Governors Mark Warner and Tim Kaine, and as Chair of the International Association of Emergency Managers Committee on Training and Education.*

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# Training & Protecting the First On-Scene Responders

By Richard Schoeberl, Fire/HazMat



First responders must be prepared to cope with the full spectrum of terrorist risks that still threaten the nation as a whole. To begin with, response personnel require ongoing education to adequately safeguard the cities and citizens they have sworn to serve and protect. Effective adequate training is, therefore, key to developing the full level of preparedness needed to cope with any catastrophe – specifically including chemical and biological incidents. The continued refinement and improvement of chemical and biological terrorism preparedness – best carried out through a multi-agency, multi-national approach – is critical to the entire nation and U.S. allies throughout the world.

## Realistic Training For Real-Life Events

Effective mitigation is particularly crucial to the protection of life, infrastructure, and the environment. Training plays a critical mitigation role by preparing first responders for an incident of almost any severity – primarily because realistic planning necessarily assumes that only first responders can be on-scene quickly enough to affect the survival rate and also mitigate the long-term risks of any unforeseen (and usually unforeseeable) attack.

Throughout the world, terrorist capabilities are growing and evolving. U.S. and allied intelligence agencies generally accept the fact that terrorist groups such as al-Qaida continue to seek – and theoretically could obtain – some current or even new types of weapons of mass destruction. If a chemical, biological, radiological, nuclear, or high-yield explosive (CBRNE) weapon is actually smuggled into the United States, or perhaps manufactured on U.S. soil, the nation's first responders must be fully prepared to act quickly and effectively.

Time and intervention capabilities are probably the most significant factors involved in coping with a terrorist

attack. To develop those capabilities, first responders require proper training on a continuing basis. In addition, before they are able to help others, they must be issued and know how to use personal protective equipment. In the unfortunate event that a chemical or biological event does happen, the first responders already on or close to the scene may not be able to wait for the several hours likely to pass before state or federal authorities could arrive.

In the first few hours following a terrorist incident, local municipalities must usually rely primarily on local resources. Today, unfortunately, although most U.S. first responders do receive adequate training, and possess the equipment needed to respond to a conventional disaster, many lack the more sophisticated equipment and advanced training needed to cope with “unconventional” chemical and biological attacks.

First responders throughout the nation have not received equal training to cope effectively with all types of CBRNE incidents. Nonetheless, each responder, local community, and state or federal agency involved has a specific role to play in a chemical or biological response. Primarily for that reason, the first responders of local communities will usually be the primary lifesaving group coping with a chemical or biological attack.

Obviously, though, the capabilities of individual responders will often vary depending, for example, on the type of weapon used, the level of responder training previously achieved, and the availability of the appropriate personal protective equipment on hand. It is, therefore, a major challenge to develop, design, and implement the optimum training curriculum for the several different levels and categories of service personnel and civilians who receive training at a CBRNE training facility in the United States. Nonetheless, such training should be consistent nationwide.

*The first few hours following a chemical or biological attack are critical in saving lives and in preventing additional spread of the agents used – all of which requires the proper training and effective equipment for responders.*

## **Building Confidence With Better Protection**

A [2010 survey](#) conducted by Meridian Medical Technologies Inc. revealed that only 42 percent of emergency medical technicians (EMTs) said that their individual departments receive the recurring training needed to respond effectively to a CBRNE and/or other terrorism incident. Another survey finding was that about half of those responding said they personally believe that a potential terrorist activity involving a CBRNE weapon or device could happen within the next three years. Even more alarming, though, was that only 37 percent of those surveyed said that the amount of time used on CBRNE training and exercises has increased during the past five years. Moreover, 25 percent of the EMTs surveyed said that the amount of time they spent on training for CBRNE incidents either has declined or is nonexistent; and a mere 15 percent reported that they are “very confident” about their own department’s ability to respond effectively to a CBRNE incident.

It is critical nonetheless for first responders to become, and remain, effective because they are truly the nation’s “first line” of defense against a CBRNE attack. However, many gaps in training and equipment still exist nationwide, including the following: (a) a lack of, or inadequacy of, the personal protective equipment needed; (b) a parallel lack of training and exercises (knowing what to do and how to do it correctly); and (c) a lack of familiarity with the equipment available and/or the procedures to follow.

Here it is worth noting that, during the 2005 London bombings, the London Fire Brigade had to delay rescue operations by up to 20 minutes while decision makers determined whether the underground explosions that had been reported involved any CBRN toxins. That delay, and the untimely interruption in rescue efforts, resulted in several additional deaths. Interruptions when responding to incidents can lead to an unnecessary loss of life as well as heavy criticism within the department.

Nonetheless, it also is true that ascertaining the levels of contamination present requires the use of specialized equipment and specialized training, which are not always available to every department involved, especially smaller departments that often receive less funding. Delays can slow rescue efforts and risk aversion

can lead to an unwillingness, and failure, to commit staff to the effort. Furthermore, lesser trained and less equipped departments run the risk of increasing the secondary contamination of responders and hospital staff due to shortages of personal protective equipment and/or the lack of expertise on how to use such equipment.

Another type of training problem is the use of curricula that are “too academic in nature” and/or lack the “real-life” setting that first responders need. In addition to practical training, providing first responders with the appropriate equipment is of vital importance. Training with equipment that responders do not routinely use in the field is impractical and could be dangerous to the individual responder. Equipment also should remain uniform and consistent within the field.

## **Better Preparedness For U.S. First Responders**

In the United States, although the current efforts in CBRNE training at the federal level are admirable, similar training is needed at the state and local levels to enable first responders in those communities to familiarize themselves with the varying degrees of CBRNE response needed. Realistically, the local first responders will be on the scene for perhaps several hours before any federal agency arrives. A plan to schedule and carry out routine refresher courses is equally important because effective CBRNE preparedness requires periodic refresher courses and exercises in order for responders to stay informed with the cutting-edge advances in curriculum and technology.

Furthermore, many U.S. training institutions do not routinely carry out live-agent training. Such training enhances and improves the self-confidence of first responders to handle actual live-agent events. Several nations – Sweden and the Czech Republic, for example – regularly use live chemical weapons training for both military personnel and first responders. Many first responders in the United States also lack the use of simulation or full-scale exercise facilities, which offer participants not only repeatability but also the opportunity for post-evaluation discussion and possibly helpful changes. Finally, CBRNE training

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should integrate civil and military personnel because, during an actual event, both components will be actively involved.

Another significant challenge for the United States is establishing parity among all agencies nationwide and avoiding insecurity and unfamiliarity when a chemical or biological attack does occur. Ideally, a CBRNE first responder program should: (a) deliver standardized instruction and training nationwide, allowing for interoperability between agencies; (b) develop the aptitude and self-assurance of the first responders who most likely will have to respond to an actual CBRNE incident; (c) expand and enhance existing CBRNE resources as response procedures and equipment technologies continue to evolve; (d) use both the social media and the internet for distance learning; (e) develop and use more realistic simulators and sophisticated computer-driven modeling; (f) upgrade the training curricula of smaller municipalities; and (g) raise the awareness of those outside the first responder community who need to be able to distinguish the characteristics of a chemical or biological attack.

To briefly summarize, CBRNE training has evolved significantly over the past couple of decades, but several major hurdles remain. Al-Qaida, although weakened, is not gone from the world scene and will continue to inspire those who want to do harm to the United States and its allies. For that reason alone, the United States must remain vigilant in combating CBRNE attacks – whether by a member of al-Qaida smuggling a CBRNE weapon into the United States from a country battered in conflict or an inspired follower within the United States who is able to acquire the components on U.S. soil. Funding, adequate training, and effective up-to-date equipment are of paramount importance, because the nation's first line of defense lies in the hands of the nation's first responders.

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*Richard Schoeberl has more than 17 years of counterintelligence, counterterrorism, and security management experience, most of it developed during his career with the Federal Bureau of Investigation, where his duties ranged from service as a field agent to leadership responsibilities in executive positions both at FBI Headquarters and at the U.S. National Counterterrorism Center. During most of his FBI career he served in the Bureau's Counterterrorism Division, providing oversight to the agency's international counterterrorism effort. He also was assigned numerous collateral duties during his FBI tour – serving, for example, as a Certified Instructor and as a member of the agency's SWAT program. He also has extensive lecture experience worldwide and is currently a terrorism and law-enforcement media contributor to Fox News, Sky News, al-Jazeera Television, and al-Arabiya.*

## A Unified Strategy for Biodefense Preparedness

By Patrick Rose, Public Health



It can be difficult to justify investments to protect against risks associated with a biological attack, particularly when compared with: (a) marauding terrorist firearms attacks (e.g., the mall attack two months ago in Nairobi, Kenya); (b) IED (improvised explosive device) detonations such as the Boston marathon bombing; and (c) even the recent chemical weapons attacks in Syria over the past several months. Each of these headline incidents provided a graphic illustration of the many ways in which determined groups, or even individual terrorists, can plan and then carry out a successful attack against a predetermined target.

In contrast, instances of bioterrorism are not only less frequent but also less tangible – for example, the April 2013 mailing of ricin-laced letters in Washington, D.C., and the much earlier anthrax mailings shortly after the 9/11 terrorist attacks. Moreover, bioterrorism attacks do not cause the visible destruction found with any of the other types of attacks described above, so it is very easy to underestimate the danger such attacks really pose.

Finally, many people often loosely categorize biological attacks with naturally occurring biological incidents – epidemics and pandemics, primarily – which at some level diminishes the gravity of the situation. Because many U.S. residents consider naturally occurring disease outbreaks to be an inevitable part of life in nations far distant from the United States, they tend to draw conclusions, under false pretenses, about the potentially catastrophic dangers posed by bioterrorism incidents.

### Biological vs. Other Attacks

There are several reasons why concern for a biological incident should receive no less attention than any other threat and, some analysts would argue, should probably receive more attention. The risk posed by an attack with a biological weapon almost anywhere in the United States is, by any measure, a clear and present danger against the entire nation. Past and recent epidemics and pandemics are illustrative examples of how such an attack might unfold based on three principal reasons.

First, a successful biological attack would take a horrendous toll on the American society as a whole. The worldwide burden of infectious diseases, in terms of lives lost – hundreds of thousands of people die each year from exposure to infectious diseases worldwide – is already painfully real. According to its website, the World Health Organization (WHO) conservatively estimates that, worldwide, [Japanese encephalitis](#) kills about 10,000-15,000/year (posted in November 2011), [yellow fever](#) about 30,000/year (posted in May 2013), [malaria](#) about 600,000 in 2010, and [tuberculosis](#) about one million in 2012 alone. In the United States, the ninth leading cause of death among adults is influenza and pneumonia, which the U.S. Centers for Disease Control and Prevention (CDC) estimated reached more than 50,000 in 2011. The release of an engineered biological weapon has the potential to match these mortality rates in a much shorter time, particularly when compared to a pandemic that might drag out for several months or more.

Second, the long-term impact of a biological attack is usually not confined by national borders. Although the perceived threat of emerging infectious diseases is often far removed from domestic shores, today's ability to travel from anywhere in the world to anywhere else in the world, no matter how distant, in less than 24 hours makes every corner of the earth vulnerable to the spread of biological diseases. History shows that most terrorist attacks are in fact geographically limited – primarily because, when they use conventional weapons, the attackers often have only one opportunity to violently disrupt society and destroy lives.

However, a biological attack does not have to occur within U.S. borders. In fact, the strategic and invisible deployment of a small number of suicide fighters armed (or infected) with a biological agent could cause a hundred fold more deaths, compared to the much lower toll killed by a suicide bomber. The emergence ten years ago of the Severe Acute Respiratory

Syndrome ([SARS](#)) virus may be an unintended example of future bioterrorist attacks. In 2003, a mere handful of people, who unbeknownst to themselves were carrying the SARS virus, travelled from Hong Kong to other destinations throughout the world. Ultimately, their journeys resulted in the death of 774 people from complications caused by that virus.

Third, advances in technology have facilitated the ability to “custom-engineer” biological agents. Although biological weapons have not been successfully employed to the maximum extent for which they probably were intended (e.g., [the failed Aum Shinrikyo anthrax attacks which had the capacity to cause great devastation, but did not](#)), today's technological advances make the development of biological weapons not only very accessible but also easier to spread.

In the past, some nation states invested heavily in biological weapons programs by creating their own clandestine laboratories. Today, numerous countries invest in national biotechnology programs as an economic driving force, and Do-It-Yourself biohackers are trending to compete with the nationally funded institutional laboratories. In short, the resources needed are readily available and the technological knowledge to encourage malicious intent already exists.

*U.S. biodefense strategies should consider preparedness efforts against pandemics as a real-life example of how a biological attack might unfold. Emerging infectious diseases may pose an even deadlier threat than an organized attack with biological weapons.*

### **Biological Attacks vs. Pandemics**

Convincing officials that it makes sense to invest in the countermeasures needed to respond to a biological incident may succeed, unfortunately, only after experiencing yet another pandemic or an actual biological attack. With naturally occurring epidemics and pandemics illustrating the outcome of a biological attack, any efforts to mitigate such public health threats also can help to develop and implement effective countermeasures against the use of biological weapons. The first step, though, should be to continue developing new and better vaccines against biological pathogens.



Such vaccines are perhaps the most powerful tools already in the public health arsenal because they can be effective in reducing the combined burden of morbidity and mortality. Their principal drawback is that vaccines are very expensive and cumbersome to develop, sometimes with little financial return on investment for the pharmaceutical companies involved.

Despite the major strides forward in building a bigger and more varied arsenal of vaccines, there is still much more to do. First, public health agencies require more vaccines against diseases that have a high morbidity rate; many of those vaccines would provide helpful directions on how a biological weapon might burden the medical health system. Second, a number of vaccines require various improvements to increase their short- and long-term effectiveness; some existing vaccines are not as effective as they should be in providing protection against biological agents. Third, the time and effort needed to develop and produce vaccines is often a lengthy process; with few dedicated facilities available to produce massive quantities of vaccine, on short or no notice, to cope with a deadly pandemic or biological attack, considerable time might pass before it is possible to mount a truly effective response.

### Reasons to Care

Pushing for technological advances and expanding the arsenal of vaccines available against emerging infectious diseases can help increase the level of readiness (i.e., response rate and versatility) for responding to a biological incident, regardless of whether the outbreak is caused by a pandemic or a biological attack. Creating and expanding the knowledge base, the technology, and the investments needed all contribute to reducing the rigidity associated with a push for new vaccines that are more accessible and delivered quickly.

In fact, the only real certainty that can be postulated is that the next biological threat will be unexpected and unanticipated; therefore, the United States and its partner nations throughout the world are already at a disadvantage. Without an effective infrastructure – including rapid vaccine development and production facilities – in place to respond quickly, the initial response will probably not be very effective. To achieve a more rapid as well as



more effective capability, the first step must be to build an infrastructure capable of producing larger and more effective quantities of vaccines. The encouragement and funding of public-private partnerships can help facilitate such infrastructure – and reap the subsequent benefits.

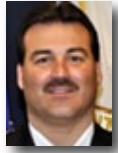
This has been a watershed year for private-public partnerships, which have stepped up to begin building the next generation of vaccines to eradicate the public health burden imposed by many deadly diseases. One notable example is that U.S. nonprofit organizations are now working alongside private industry to develop the newest and most promising vaccine against malaria. The most obvious benefits derived from these partnerships are that: (a) investments are helping to advance vaccine design technologies; and (b) production processes are not only increasing the versatility of vaccine development but also doing so at lower costs. The most important results, though, will be a reduction in the high morbidity rate of many infectious diseases worldwide. Providing a solid foundation of political as well as financial support for such efforts will help all nations prepare more effectively for a biological attack – when, not if, it occurs.

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*Patrick Rose, a Senior Analyst at Gryphon Scientific, holds a Ph.D. in Microbiology and Immunology from Oregon Health and Science University. Prior to joining Gryphon Scientific, he was a senior policy analyst at the University of Maryland's Center for Health and Homeland Security and an instructor in the Senior Crisis Management Training Program at the U.S. State Department's Office of Anti-Terrorism Assistance. His endeavors include supporting efforts domestically and internationally to improve disaster preparedness and increased public health readiness in the field and at the policy level. He also serves as Adjunct Assistant Professor at the University of Maryland Department of Epidemiology and Public Health.*

# Protecting Life & Civil Liberties – Masters of Collaboration

Charles J. Guddemi, Special Events



Collaboration is no longer an option. In today's interconnected society, agencies and organizations must communicate with each other, coordinate resources, and align priorities. In Washington, D.C., New York City, and San Francisco, California, the United States Park Police (USPP) at each location face even greater challenges because of their close proximity to national and international people and places of interest, as well as to the critical infrastructure that is weaved into the daily operations of those major metropolitan cities.

The USPP must coordinate efforts among various branches within its organizational structure, as well as with outside agencies. Headquartered in the nation's capital, the USPP is responsible for large areas of federal parkland that lie adjacent to land and property protected by neighboring law enforcement agencies. To maximize resources, and avoid the added cost associated with bringing in USPP officers from other parts of the nation, there are benefits for collaborating with those neighboring agencies.

However, somebody has to take the first step and open the lines of communication. The relationships

and collaboration, which have led to the successful implementation of thousands of special events held each year on federal land, have been many years in the making. When tragedies such as the 16 September 2013 shooting at the Washington Navy Yard take place, the planning, training, and collaboration cultivated from scheduled events help promote a more rapid and effective response to such unplanned incidents.

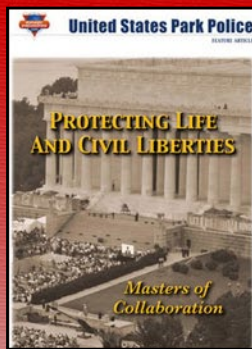
For the USPP, every day is different and each planned event serves as a new learning and training opportunity to better prepare for the unexpected. Partnering with outside agencies is a key factor for success. By facilitating resource sharing and promoting greater situational awareness, such partnerships are the foundation for building a safer, more protected homeland.

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*Charlie Guddemi is a captain with the United States Park Police, where he has served since 1991. He is currently the assistant commander of the Technical Services Branch. During his years with the United States Park Police, he has had assignments in the San Francisco Field Office (Presidio and Golden Gate National Recreation Area), New York Field Office (Statue of Liberty N.M./Ellis Island Immigration Museum), Northeast Regional Office (Philadelphia, Pennsylvania), and National Capital Region (Washington, D.C.). He previously held positions as patrol supervisor, station commander, regional law enforcement specialist, commander of the Special Forces District, and commander of the Special Events Unit.*



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# NamUs: Narrowing the Search for Missing Persons

By Joseph Cahill, Law Enforcement



In 2012, some 1,800 people went missing in the United States every day; some of them later turned up in hospitals, jails, or morgues. Others simply walked through the front doors of their homes into the embraces of those who love them. A large number, though, are still missing. According to the Federal Bureau of Investigation's (FBI) National Crime Information Center (NCIC), there were 661,593 official missing-person reports entered into the FBI's own records last year. Of that number, 87,217 were still missing as of 31 December 2012.

U.S. law enforcement officers, at every level of government, have for many years used such tools as the NCIC and the Combined DNA Index System (CODIS) – both of which are managed by the FBI – as invaluable resources in their searches for missing persons. Both systems provide law enforcement agencies a quick and easy way to share information and compare notes on missing persons – on unclaimed and/or unidentified human remains as well. Until recently, however, there was no immediate resource available that the public could use to play a more active role in the searches for their loved ones.

## Three Databases, One Source

In 2009, the U.S. Department of Justice's National Institute of Justice made the fully searchable National Missing and Unidentified Persons System (NamUs) available to a broader group of users as an additional resource. Both law enforcement agencies and the U.S. residents now can use NamUs to help find and identify missing persons and/or human remains. NamUs is composed of three major databases: unidentified remains; unclaimed remains; and missing persons.

The unidentified-remains database enables medical examiners and coroner staff members to enter information about human remains when they are unable

to positively establish the identities of the bodies in their care. Some of the bodies may have tentative identities attached; but there may be no identification at all for others. Unlike the records in the unidentified-remains database, the authorities do know (or are reasonably sure they know) the identities of the bodies in the unclaimed-remains database – but they must still enter the information available in an effort to help locate the families of the deceased persons. Use of the third database, on missing persons, is not restricted to public officials but is available to anyone willing and able to provide additional information about a person still missing.

*There were 661,593 missing-person cases officially reported last year in the United States. Many of those missing later came home on their own, others were found – in jails, morgues, or hospitals – but almost 90,000 were still missing at the end of the year.*

## More Data, More Answers, Fewer "Unidentifieds"

The NamUs system differs significantly from the other systems, which only law enforcement officers can use to access data, by allowing the public to search and read at least a small amount of potentially helpful information. In addition, by allowing the public to add someone's name to the missing-person database, the NamUs system can more effectively leverage the data provided by those who best know (or knew) the missing person(s).

The data entered into the missing-person database is automatically cross-referenced with the other two databases. In most ways similar to the searches carried out with the CODIS and NCIC systems, the NamUs system facilitates and improves the research and contacting processes of numerous local, county, and/or state medical examiners' offices by combining the data received from multiple jurisdictions into one easily searchable source.

A missing person from Georgia, obviously, may later be living in Florida, Alabama, South Carolina – or, for that matter, any other state or even overseas. So expanding the geographic area covered was a logical

next step. Moreover, in addition to contacting neighboring states, some states now have consolidating county systems in their death investigations, a system that may increase the number of calls required to search for any missing person but at the same time helps improve the percentage of cases closed.

Sometimes, if these same agencies have entered potentially helpful information on any unidentified and unclaimed remains into the appropriate NamUs databases, they would be more likely to reunite the missing persons with their families. In the case of unidentified remains, the family may be able to provide information – dental records, for example – that leads to the positive identification of the remains. Similarly, when the same information is entered into the unidentified- and/or unclaimed-remains databases, the data can be compared to similar information and possible matches from those already entered in the missing-person database. Of course, public officials

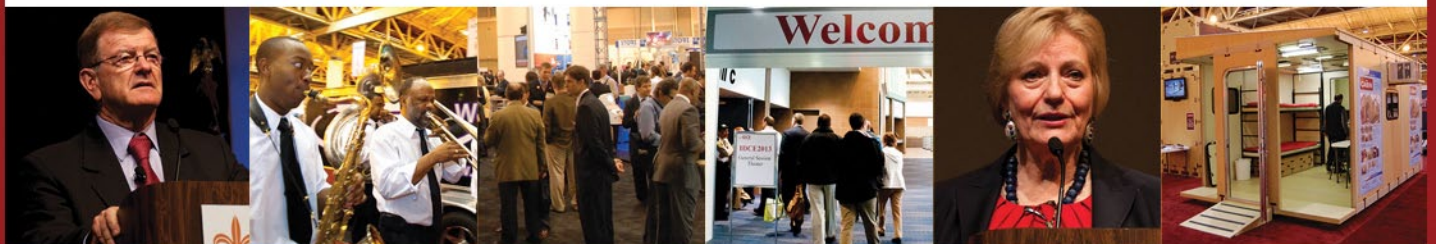
and private citizens also can carry out their own manual searches of the information.

The principal strengths of the system are the collaboration and data-sharing capabilities. By allowing anyone to search the databases, and permitting more people to enter additional and potentially helpful information, the offices of local medical examiners and coroners can harvest more information and, in many cases, reunite more families with the remains of their loved ones.

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*Joseph Cahill is the Director of Medicolegal Investigations for the Massachusetts Office of the Chief Medical Examiner. He previously served as exercise and training coordinator for the Massachusetts Department of Public Health and as emergency planner in the Westchester County (N.Y.) Office of Emergency Management. He also served for five years as citywide advanced life support (ALS) coordinator for the FDNY – Bureau of EMS. Before that, he was the department's Division 6 ALS coordinator, covering the South Bronx and Harlem. He also served on the faculty of the Westchester County Community College's Paramedic Program and has been a frequent guest lecturer for the U.S. Secret Service, the FDNY EMS Academy, and Montefiore Hospital.*

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