



PREPAREDNESS
LEADERSHIP
COUNCIL

INTERNATIONAL

A changing global threat environment, coupled with increasingly interdependent societies and aging infrastructures, is a dangerous combination that must be addressed by today's preparedness leaders.

March 2015

Optimal Biothreat Preparedness: Impeded by Deficits in Funding, Training & Risk Communication

Ellen P. Carlin

Foreword by Bruce W. Clements

**Optimal Biothreat Preparedness:
Impeded by Deficits in Funding, Training & Risk Communication**

By Ellen P. Carlin

Foreword by Bruce W. Clements

The Preparedness Leadership Council International

The Preparedness Leadership Council International (PLC), formerly the DomPrep40, is a thought leadership group comprising insider practitioners and opinion leaders who offer advice and recommendations on topics relevant to emergency planners, responders, receivers, local-state-federal authorities, nongovernmental organizations, and the private sector. Focusing primarily on prevention, protection, response, recovery, and mitigation, the PLC is tasked with developing quantifiable and qualitative feedback from surveys and roundtable discussions that is gathered from and shared with a broad multidiscipline, multijurisdictional audience of operational professionals and policy advisors. Information is shared via the publications: DomesticPreparedness.com (online and mobile), DPJ Weekly Brief (email newsletter), and the *DomPrep Journal* (PDF download).

DomesticPreparedness

DomPrep is an information service for the preparedness community. Created in 1998, DomPrep offers content – provided by practitioners and subject matter experts – to tens of thousands of first responders, medical receivers, emergency planners, local-state-federal authorities, nongovernment organizations, and private sector professionals. Downloadable reports, articles, audio-video clips, podcast interviews, and information gathered from roundtable discussions are widely used by the multidiscipline, multijurisdictional audience that DomPrep serves. The professionals who help plan for, respond to, and recover from any emergency incident or special event are invaluable to their communities.

Note: All comments provided in this report reflect the opinions of the individuals and do not necessarily represent the views of their agencies, departments, companies, or organizations. Quotes within the report without acknowledgment were made anonymously by survey respondents.

© Copyright 2015, by IMR Group Inc., publishers of DomesticPreparedness.com, the DPJ Weekly Brief, and the *DomPrep Journal*. Reproduction of any part of this publication without express written permission is strictly prohibited.

IMR Group Inc., 517 Benfield Road, Suite 303, Severna Park, MD 21146, USA; phone: 410-518-6900; email: info@domprep.com; also available at www.PLCouncil.org and www.DomesticPreparedness.com

ABOUT THE AUTHORS



Ellen Carlin, D.V.M., is a veterinarian whose professional expertise centers on the fusion of diverse but related interests in the life sciences, medicine, and homeland security. As principal of Carlin Communications, she provides government relations and scientific writing and editing capabilities. In 2013, she completed a fellowship with the U.S. Food and Drug Administration Center for Veterinary Medicine. Before that, she was a senior professional staff member with the U.S. House of Representatives Committee on Homeland Security. She also has worked or volunteered as a small animal clinical veterinarian for organizations including the Washington Animal Rescue League and the American Society for Prevention of Cruelty to Animals, and continues to volunteer time toward animal welfare initiatives.



Bruce Clements, M.P.H., is currently the public health preparedness director at the Texas Department of State Health Services, where he is responsible for Texas public health and medical preparedness and response programs. He formerly held the preparedness director position in the state of Missouri. He has worked in the defense sector developing anthrax response protocols and in the healthcare sector as an infection control occupational health intervention manager at BJC Healthcare in St. Louis, Missouri. His military experience includes more than 23 years of service with assignments as a chemical, biological, radiological, and nuclear defense instructor and as a public health officer in the United States Air Force and the Missouri Air National Guard. He served as a volunteer for the Missouri Task Force 1, Urban Search and Rescue Team, and the Missouri-1 Disaster Medical Assistance Team. He also worked as the associate director for the Saint Louis University, Institute for Biosecurity. He has lectured extensively on public health preparedness topics, served as a resource for major broadcast and print media outlets, and published articles and books on preparedness.

~ This page was left blank intentionally ~

TABLE OF CONTENTS

Acknowledgments	vii
Foreword	viii
Summary	1
I. Ebola: Challenging the Conventional Wisdom	3
II. Resource Creativity	10
III. Back to Basics	18
Key Findings	22
Action Plan	24
Endnotes	25
Appendix A – Biothreat Roundtable Participants	26
Appendix B – Contributors	27
Appendix C – Preparedness Leadership Council	31
Appendix D – Demographics of DomPrep Respondents	34

~ This page was left blank intentionally ~

ACKNOWLEDGMENTS

Who would have thought that Ebola would come to Texas? I didn't! Nor did many others.

When the Preparedness Leadership Council's Biothreat Working Group was planning its roundtable, the city of Austin, Texas, was chosen as the location for many reasons, including a very active state public health system, a forward-leaning academe (specifically Texas A&M), and an innovative private sector. Little did we know that the Ebola incident that hit Dallas would make our deliberations very real.

The conclusions I drew as an observer of the roundtable were: (a) there is a huge gap between policy and operations; (b) while preparedness professionals talk about readiness, they are better at resilience; and (c) even though Ebola was on the radar, we were surprised.

Ellen Carlin, D.V.M., has a passion for the topic of biothreats. Her professional credentials include expertise in life sciences, medicine, and homeland security, which made her the perfect person to lead this working group and author its findings. Ellen, we are grateful for your effort and dedication to this issue.

Included in the working group was a stellar team of advisors, which included Amy Altman, Ph.D., Gerald Parker, D.V.M., Jeff Runge, M.D., Matt Scullion, Maureen Sullivan, Mike Wernicke, and Thomas Zink, M.D. In addition, Bruce Clements provided wisdom and wrote the foreword for this report. Thank you to them all for their expert opinions.

Also contributing to this report, more than 600 individuals answered the related survey and shared their ideas. By including nationwide feedback, these reports are very robust and offer both senior operational professionals and policymakers actionable points when making decisions.

Thank you to BioFire Defense, Emergent BioSolutions, FLIR Systems, and Luminex. Without their financial support, this report would not have been possible. Finally, thank you for the professional staff support from the DomPrep team including Catherine Feinman, Susan Collins, and Carole Parker. A good job indeed.

Martin D. Masiuk
Executive Director
Preparedness Leadership Council International

FOREWORD

This Preparedness Leadership Council report provides added insight into the nation's ability to prepare for and respond to a variety of biological threats. In 2014, the worst Ebola outbreak in recorded history made its way from Africa to the United States. As the response progressed, the challenges that emerged displayed the inextricable connection between public health and medical preparedness. The Public Health Emergency Preparedness (PHEP) Program and Hospital Preparedness Program (HPP) have supported enormous strides in the nation's preparedness posture. Federal efforts toward grant alignment also have contributed to national preparedness coordination efforts. Unfortunately, funding has been trending downward since the inception of these important programs. As more infectious disease threats emerge, the critical nature of preparedness programs becomes more apparent, and funding shortfalls will continue to reduce the effectiveness of public health and medical emergency response.

Federal funding for healthcare and public health emergency preparedness began soon after the 9/11 terrorist attacks and subsequent anthrax letters. This raised awareness of bioterrorism and biocrimes that may utilize common or rare bacterial or viral pathogens, toxic byproducts, or even specially engineered organisms never before seen. The initial post-9/11 funding allocated for state and local public health and healthcare preparedness was specifically focused on these threats and was referred to as "bioterrorism funding." Over time, the funding was expanded to "all hazards" under both the PHEP and HPP programs. This was an appropriate programmatic change in light of the broad impact all disasters have on public health and medical capacity. However, some policymakers and preparedness professionals supporting or working on these programs have lost sight of the unique challenges posed by biological attack scenarios. This change in focus has continued as widespread infectious disease threats are emerging on a more frequent basis as observed with novel influenza strains, Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). A renewed, specialized focus is needed for emerging infectious disease and bioterrorism threats. This includes expanded and enhanced planning, training, and exercises.

There continues to be a rise in emerging infectious disease threats, as well as diseases that are reemerging due to globalization, drug resistance, and declining participation in vaccination programs. Reactive federal funding surges occur too late and are not an effective approach. In 2006 for "bird flu" and again in 2009-2010 for H1N1, substantial one-time funding was provided for influenza preparedness. Most recently, one-time PHEP and HPP Ebola supplemental funding was distributed. However, one-time funding does not build the kind of infrastructure needed to adequately prepare for infectious disease

threats. It is akin to waiting until there are widespread fires burning before funding adequate fire stations, fire trucks, and firefighters. The preparedness investment must be proactive, adequate, and ongoing to establish and sustain the public health and medical preparedness infrastructure needed to respond to these ever-growing biological threats. Congress and the White House must make these programs a top priority on par with Homeland Security and Defense. No other security challenges pose such a rapid, widespread, and destabilizing risk to the United States as biological threats.

Bruce W. Clements, M.P.H.
Public Health Preparedness Professional
Austin, Texas

~ This page was left blank intentionally ~

SUMMARY

The Preparedness Leadership Council (PLC) roundtable discussion on biothreats, held in Austin, Texas, on 28 October 2014, sought to identify continuing challenges in the nation's approach to preparing for biological threats. The meeting was planned for Texas prior to the introduction of the first Ebola case there; although coincidental, this turn of events provided an extremely timely platform from which to reflect on the nation's assumptions about, planning for, and prioritization of biological threats. It also enabled the group to tease out those dynamics of the Texas Ebola response that were generalizable to preparedness across the United States.

The meeting was approached by way of three topical areas: (a) Ebola – overview of experiences; (b) training and exercises; and (c) risk communication and social engagement. The virtue of organizing discussion around these key topics was that it allowed the conversation to focus on key areas with perceived gaps. The following broader themes were elicited by way of that discussion, and provide the basis for the structure of this report: Ebola as a challenge to the conventional wisdom (Section 1); resource creativity in a time of declining dollars (Section 2); and getting back to basics (Section 3).

Twenty-three senior subject matter experts representing state and local public health, local fire, local emergency response, federal law enforcement, National Guard, industry, and academia participated. From this discussion, the PLC created a nationwide survey for Domestic Preparedness' (DomPrep) audience to provide additional input and comments. The information provided by 600 DomPrep readers who responded to the survey have informed this report, and the results are found in figures throughout.

This report is a meeting readout. It relays the sentiments of the many experts who participated, but is not an exhaustive analysis of their recommendations and how they could be implemented. It is meant to lay groundwork for the next step, which is careful consideration by key leaders and policymakers of the recommendations. The information relayed herein is generally reflective of opinions voiced at the meeting (and by the survey respondents), though any given statement should not necessarily be viewed as consensus.

Key Issues

- I. *Federal leadership.* The spread of Ebola from the index patient to the nurses who cared for him finds its source fundamentally in failures of leadership on the federal level. Ebola is not an infection that is beyond the capability of U.S. resources and know-how to contain. The sense that federal leadership has been and continued to be lacking throughout the crisis is a salient explanation for

these failures. If turned around, the result would be increases in funding levels, training frequency, and communication effectiveness, the remaining key issues identified by the roundtable.

- II. *Funding*. Declining funds have real-world impacts. The level of funds impacts frequency and quality of preparedness activities, and proper guidance for their use is just as important.
- III. *Training and exercising*. Inadequate training and exercising is one of the most important gaps hindering optimal biopreparedness.
- IV. *Communication*. Government at all levels must do a better job communicating with one another, releasing authoritative and consistent messages, and developing technological tools for improved information sharing.

This report explores specific findings in the areas above, and makes recommendations for policymakers to deal with some of the shortfalls identified. In short, the recommendations are:

1. The Joint Commission on Accreditation of Healthcare Organizations should consider the addition of biothreat emergency response and preparedness standards to its accreditation standards.
2. Public health and preparedness grants should be shifted from annual to multiyear funding cycles.
3. A legal mechanism that allows release of federal funding for public health emergencies, similar to the Stafford Act, should be developed.
4. The National Disaster Medical System should consider a shift in focus from trauma preparedness to infectious disease preparedness.
5. The National Health Security Strategy should be augmented to significantly address and prioritize risk communication as a fundamental component of achieving health security.
6. The federal government should take on new policy development for emergency service and healthcare provider protocols for and training in high-consequence infectious disease preparedness activities.
7. The federal government should take on the responsibility of funding and developing an interoperable, national information sharing system that states and localities can use to manage health emergencies.
8. Local officials should develop plans and partnerships with key community groups, allowing for much greater surge for important emergency response functions.

I. EBOLA: CHALLENGING THE CONVENTIONAL WISDOM

“In many cases, we’re misaligned in how we’re lining up our troops.”

–Matthew Minson, M.D., Medical Director, FEMA-USAR Texas Task Force One

The Great State of Texas is one of 50 representative states in the Union and yet, in many ways – with its expansive landmass, population, and borders – is much like a nation. As big as some countries, Texas shares 1,954 miles of land and 26 border crossings with Mexico. From the Port of Orange in the northeast corner, down the coast to the Port of Brownsville, its sea ports provide a lifeline for commerce, handling 564.7 million tons of cargo in 2011.¹ Texas possesses two of the nation’s 28 Category X airports and nearly 400 airports in total.

Yet, Texas’s vast and porous size and scope belie the reality of the appearance of the first human Ebola case in the United States: It could have happened anywhere. An Ebola-infected traveler could have reached a final destination in any one of 50 states, five territories, or the District of Columbia. West Nile-infected mosquitoes could hitch a ride on airplanes headed for New York. Chikungunya-infected travelers could return home, with the virus prepared to emerge in any state that hosts a biologically appropriate insect vector. Anthrax spores could be sent through the mail and arrive at doorsteps from Connecticut to Florida. Likewise, Ebola could manifest in any state of the Union. One may like to believe that locales more isolated than Texas are more immune to an outbreak of an emerging disease or act of bioterrorism but, if Ebola has taught the nation anything, it is that it respects no borders at all. Any infectious disease shares this basic truth.

And yet, the emergence of Ebola into West Africa and subsequently into the western world surprised many. It challenged the conventional wisdom that:

- Some types of infection are simply endemic to some places and will stay there;
- If they did not, global surveillance would be good enough to catch the problem in time; and
- If it did not, the best public health and hospital system in the world would know how to control it.

Not all roundtable participants agreed that Ebola took them by surprise. Larry Jantzen, battalion chief at the Austin Fire Department, did not feel that Ebola was a particular surprise to his unit, stating the frequency with which other infectious disease threats have made their way to the United States eventually. But on the whole, most would agree that many warning signs went unheeded until Ebola was nearly at the

front door. This raises two questions: (a) Were global surveillance mechanisms insufficient, or were their warnings simply ignored? And (b) Had the threat of specific foreign and emerging infectious disease been subjugated to all-hazards preparedness, or to more immediate domestic public health concerns, to the detriment of Ebola awareness and preparedness? Maybe it was the route of transmission that caught the nation off guard. Ebola had been stamped a decade earlier with an official bioterrorism “material threat” moniker, but in the end it came not from al-Qaida but from Mother Nature. It had even touched U.S. shores in 1989 through imported research primates, spawning no human cases, but a best-selling book, a popular movie, and overhauled import and quarantine regulations. The government and now the public knew that it was out there, somewhere.



BioThreat Working Group Roundtable, Texas State Capitol, Austin, Texas, 25 October 2014

Planning for the Unknown and Unknowable

Perhaps one of the most jarring aspects of the first U.S. Ebola case was its environmental element. Environmental remediation is an issue that participants commented requires deeper levels of planning than had been heretofore considered for “abnormal” threats. The experience with Ebola brought into relief two lagging aspects of remediation planning in particular: consideration for how expansive the volume of contaminated items could be, and methods for implementation of their disposal (Who would do this? What permits would need to be in place? How would the waste be processed? How is “clean” defined and certified?). Texas officials found that 140 barrels of waste from the residence of the

first patient, Thomas Duncan, could not be readily disposed of across state lines the way common medical waste could. This was due to lack of transportation permits and lack of willing recipients. The movement of Duncan's remains faced similar problems, with officials unable to find a willing local cremation facility.

It became clear that these recovery activities could not simply follow response in an intuitive, chronological way, but rather needed to be executed simultaneously with response plans. This had been only minimally considered. The fundamental lesson, participants said, is that the preparation for high-consequence emerging infectious diseases is unique.

The Ebola cases required planning elements that simply had not been considered, like specialized personal protective equipment (PPE) availability, and quarantine procedures for pets. Some of these challenges probably should have been thought of; others probably could not have been reasonably predicted. And, of course, even if all contingencies for all scenarios could be imagined, resource limitations would put serious pressure on how well each could be planned for. Yet, clearly in the case of Ebola, there was good reason that the introduction of the disease and its consequences at the very least should not have come as such a surprise to so many.

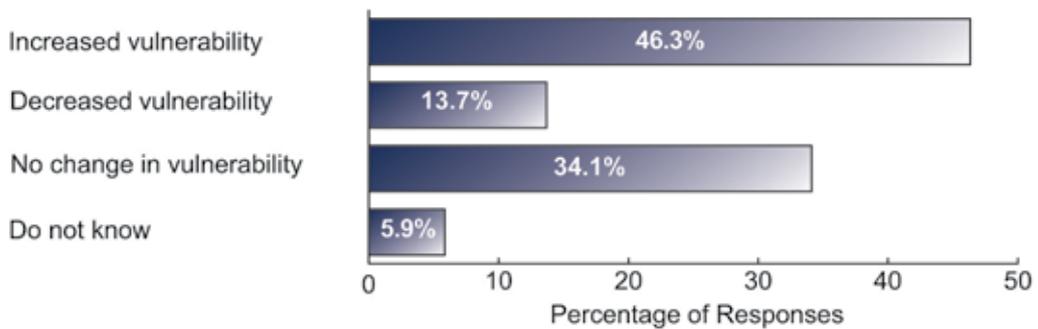
In light of these "failures of imagination," to borrow the now-famous phrase of the 9/11 Commission: How do decision-makers force their minds and their policymaking frameworks to become more creative about and flexible toward the threats that challenge the conventional wisdom? This question of how to plan for the unknowable or unusual was pervasive throughout the meeting. There was discussion about how one can better make intellectual leaps to predict needed actions in the absence of experience, and what the key elements of preparedness are that allow for this.

One meeting observation was that the implementation of the Incident Command System (ICS) in Texas was a major factor in allowing a successful response to that which had not been explicitly planned for. From training in Ebola PPE to canine quarantine to contaminated clothing, a lot of previously unknown or unconsidered contingencies surfaced. They ranged from operational concerns to broader policy problems. Texas's ability to manage those issues was based at least in part on the deep integration of ICS into Texas's planning and response.

Impacts of Revealing Vulnerability

Yet, vulnerabilities were still revealed, from mishaps at the hospital level in terms of diagnosis and containment; to surprises at the state and local government levels in terms

Figure 1
What effect has the U.S. response to its domestic Ebola cases had on its vulnerability to terrorists who might seek to use biological weapons?

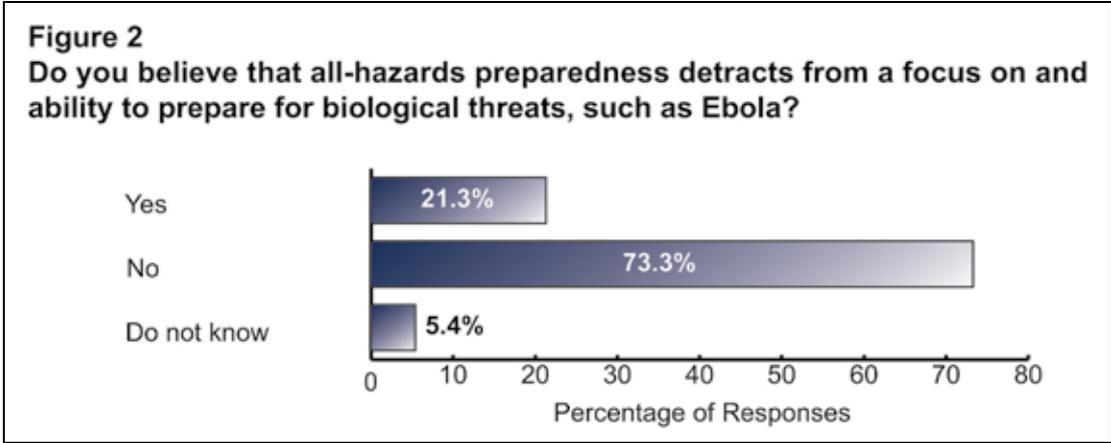


of waste disposal; and to poorly developed concepts at the national level in terms of quarantine implementation and messaging.

Participants discussed whether these newly revealed vulnerabilities, obvious now to the world, could be exploited for nefarious purposes. Law enforcement concerns might include terrorist intent to weaponize medical waste, and heightened concerns about border crossings as an attack vector. The DomPrep survey asked readers what effect the U.S. response to its domestic Ebola cases had on its vulnerability to terrorists who might seek to use biological weapons (see Figure 1). Nearly half of respondents judged an increase in vulnerability, with about the same seeing decreased or no change. Thus, a difference of opinion with no clear consensus emerged on this issue. The fact remains that predicting what terrorists will do is very difficult. All intelligence tools must be brought to bear – but to do that, biothreats must be a priority, and it is not clear that they have been so in recent years.

Terrorists are not the only group to whom the weaknesses were revealed. Perhaps most importantly, the nation revealed them to itself. The U.S. cases were a wake-up call and reminder of important planning deficits particularly in PPE readiness and anticipating environmental impacts. And they were a reminder of important truths:

- High-consequence infectious diseases are unique and require at least some specialized planning.
- An outbreak of a high-consequence agent with no known medical countermeasures truly limits the ability for a community and a nation to effectively respond.
- Public health is a team sport, and success requires interdisciplinary and intergovernmental partnership.



All-Hazards Versus Focused Preparedness

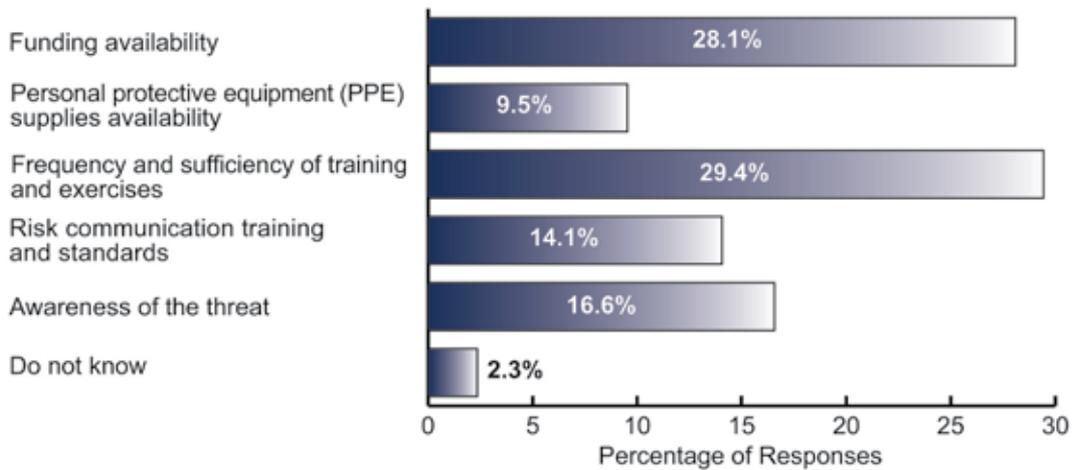
Ebola was also an important reminder that preparation for emerging infectious diseases is different than that for tornadoes or hurricanes. The question, however, of whether all-hazards provides the best framework within which to promote biothreat readiness is a subject of disagreement.

Some meeting participants felt that all-hazards preparedness has been an important policy thrust but, taken to the extreme, it may have detracted some of the focus away from, and come at the expense of, infectious disease readiness. One survey respondent wrote that more funding should be provided for specific biothreat preparedness activities. Most DomPrep readers, though, were not in agreement with this perspective (see Figure 2). Seventy-three percent indicated their belief that all-hazards preparedness has not detracted from a focus on and ability to prepare for biothreats. Many stressed the importance of all-hazards preparedness to preparedness for many kinds of threats.

To some extent, this discrepancy may relate to differences in contextual experience. On the ground, many of the emergency response actions that are so critical to any response can go a long way to preparing responders for almost any specific emergency with public health implications. As Chris Johnson of Virginia Mason Healthcare phrased it in his survey response, “Many healthcare organizations have ended up spending hundreds of thousands of dollars to plan, equip, train, retro-fit, and otherwise prepare for a scenario that has very little chance of happening.” Yet, some individuals who work at the federal policy level have observed a diminishment of focus on biological threats, in terms of prioritization of funding for medical countermeasures, development of guidance for the use of the countermeasures, and prioritization of biothreat planning, training, and exercises. These biopreparedness-minded federal planners for the most part understand that all-hazards is

Figure 3

Which do you consider the largest gap in or hindrance to biothreat preparedness (where “biothreat” includes deliberate events and emerging infectious diseases)?

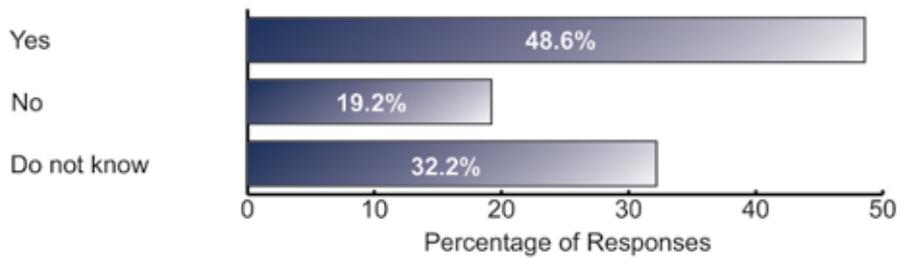


a reasonable means to achieve a great deal of readiness, but a special push also must be pursued and maintained to prepare for the unique dynamics of certain infectious diseases.

As a health security issue, the cost for the special aspects of biothreat planning should reasonably be borne by the federal government. At the same time, the responders at the local and hospital levels could mitigate some of the need for costly advanced training by ensuring that they adhere to the most fundamental infection control protocols that have wide application to all infectious disease. This was reiterated throughout the survey responses as a deficit and, therefore, an area that should be taught and exercised as much as the more specialized response protocols. When asked to choose among five statements that described the largest gap in or hindrance to preparedness, respondents were about evenly split between funding concerns and the frequency and sufficiency of training and exercises (see Figure 3).

An additional potential hindrance to preparedness raised at the meeting was the focus of the National Disaster Medical System (NDMS). This issue is related to the all-hazards question. Matthew Minson, medical director of the FEMA-USAR Texas Task Force One, indicated that NDMS has remained very trauma focused throughout the past decade, staffed in majority by individuals trained in emergency medicine. Yet, teams and field hospitals have not seen as much trauma as they have medical pathology, chronic disease pathology, and acute disease – that is, needs more on the broader clinical and public health side. Even

Figure 4
Is the National Disaster Medical System too trauma focused at the expense of infectious disease?



in disasters that have wreaked significant physical destruction and concomitant human trauma, like the 2010 Haiti earthquake, the scope of the public health need ultimately dwarfed the traumatic injuries. “In many cases, we’re misaligned in how we’re lining up our troops,” Minson said. Nearly half of survey respondents agreed (see Figure 4).

II. RESOURCE CREATIVITY

“We’re going to have to figure out a better way to talk about [high-consequence infectious disease].”

–Gerry Parker, D.V.M., Ph.D., M.S., Texas A&M Health Science Center

Continued advocacy for federal funding that is concomitant with the threat and that is sustained is mission critical. Much discussion ensued at the roundtable on this topic, and the survey found funding availability to be a critical hindrance to biothreat preparedness (see Figure 3). Because much already has been discussed and written about the need for additional funding to support biopreparedness, the roundtable focused its efforts on identifying ways in the interim to work around this problem.

The Importance of Federal Grants and Impacts of Their Decline

The U.S. Department of Health and Human Services (HHS) Assistant Secretary for Preparedness and Response (ASPR) administers two grant programs of critical importance to biothreat preparedness: the Hospital Preparedness Program (HPP) and the Public Health Emergency Preparedness program (PHEP). In general, HPP provides funding to hospitals and healthcare coalitions (via distribution from states, territories, and large metropolitan areas) to improve surge capacity and enhance hospital and community preparedness for public health emergencies. The framework consists of eight healthcare-specific capabilities, which include planning, equipping, training, exercising, and evaluating activities for health system preparedness. By its nature, the end-users of this grant are generally for-profit facilities. This contrasts with PHEP, which targets state, local, tribal, and territorial governments as the end users. These funds typically go to public health departments to improve their readiness capacity for public health threats. Roundtable participants noted this important difference between HPP and PHEP: HPP funds mostly private enterprise, while PHEP funds governments.

Hospital preparedness and the HPP program in particular were the subjects of lengthy discussion at the roundtable. Prior to 2006, as noted in the previous section, much of the thrust of HPP was not just the biothreat, but trauma (like the NDMS). Trauma probably was “easier” to consider than other threats like infectious disease, and perhaps more at the forefront of some policymakers’ minds after 9/11, an event where physical injuries were traumatic in nature. (The laboratory capacity deficits made clear by the subsequent anthrax attacks, in contrast, helped build resiliency into the public health laboratory and response system, which is the focus of PHEP.) Bruce Clements, director of community preparedness for the Texas Department of State Health Services, commented that much of

the HPP efforts in the first few years went into purchasing supplies and equipment, training healthcare providers, and organizing assets like ambulance and nurse strike teams, and mobile medical units. HPP has indeed allowed for training and exercises – for example, after the 2013 West, Texas, chemical explosion, Clements said that local hospitals were successfully able to surge and coordinate patients and resources from one to another, and HPP funding helped prepare for that level of coordination.

None of this is to say that infectious disease was not a component of HPP. Clements noted that HPP, in those early years of focus on buying equipment, did include purchases of infectious disease assets like PPE and decontamination set-ups for hospitals. In contrast, however, HPP funds today primarily support the work of hospital coalitions, including planning, training, and exercises. Purchasing equipment has become a much lower priority given the dramatic reductions in HPP funding; the money available is used primarily to support personnel.

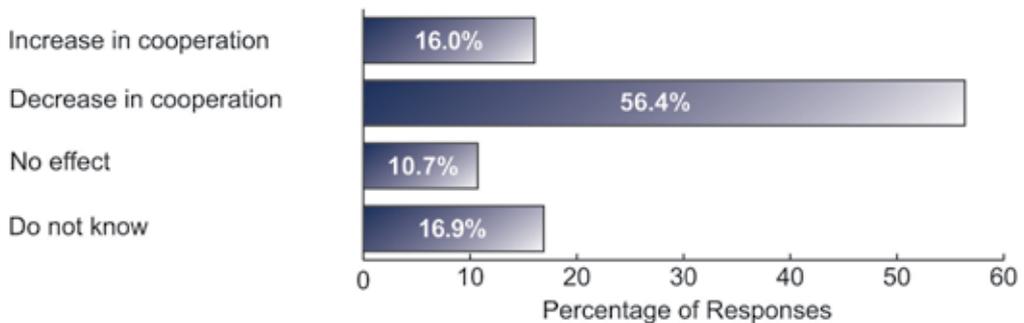
Ebola has helped to reveal facets of hospital preparedness that work, and those that still need improvement. With this in mind, much discussion has occurred, among policymakers and the roundtable participants, about HPP funding levels. From fiscal years (FY) 2002-2014, more than \$5 billion has been provided through HPP in cooperative agreement funds.² From a high of \$515 million in FY 2003, the amount has declined nearly every year since, to a low of \$255 million in FY 2014 that many have held up as an example of the deprioritization of hospital preparedness and public health security more generally. (This amount was upheld under the FY 2015 Continuing Resolution.)

The level of HPP funding and whether it has been spent wisely has been much debated in the wake of Ebola. Some argue that the recent declines are to blame for failures in hospital response to Ebola. Others argue that \$5 billion over a decade should have been sufficient to prevent the gaps that were seen, and that it is not lack of funding but lack of leadership to properly direct that funding that is to blame. Personnel reductions have placed an increased burden on communities to sustain critical functionality with less federal support. On the positive side, one participant noted that, as communities have had to adapt to decreased personnel levels, a rise in local-level cooperation has been seen. The DomPrep survey respondents appeared to feel the opposite, with 56 percent perceiving a decrease in cooperation as a result of declining funds (see Figure 5).

Many states and localities are also heavily dependent on U.S. Department of Homeland Security (DHS) grant funds for biopreparedness. One participant noted that the DHS reduction of Urban Area Security Initiative (UASI) designations (which went from 64 to 36 metropolitan areas in FY 2011) has meaningfully affected preparedness in certain jurisdictions. Jantzen of the Austin Fire Department stated that Austin's loss of certain

Figure 5

As federal grant funding decreases and the personnel levels are reduced, what effect have these changes had on interagency cooperation at the state, local, and community levels?



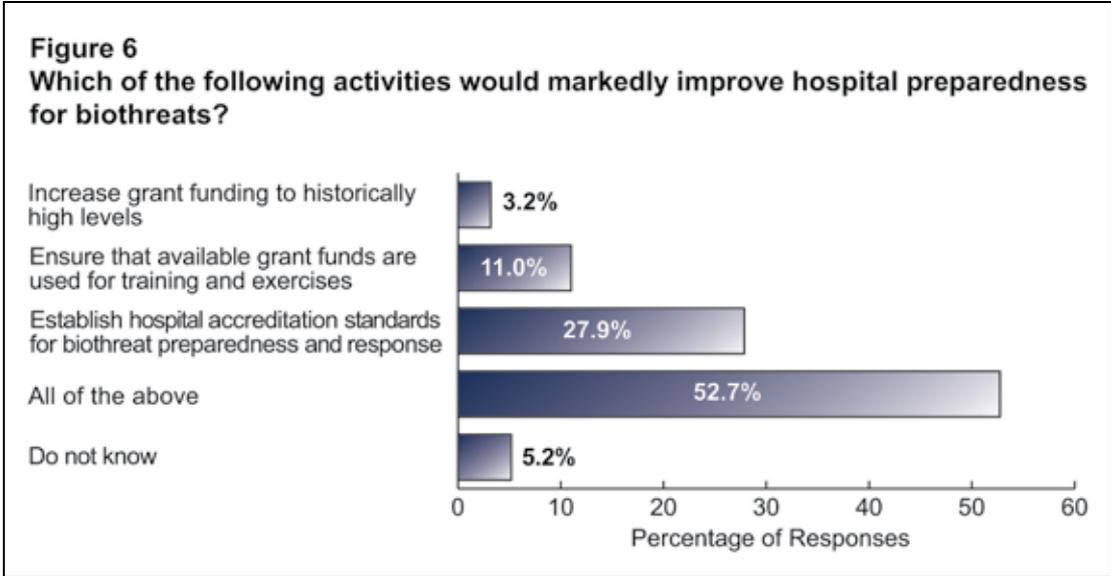
funding due to the elimination of its UASI designation has left the city challenged to fund large-scale exercises. Risk-based funding for terrorism preparedness broadly has been deemed by many policymakers to be a sensible allocation of limited funds. Although this approach is a sensible use of finite funding to combat terrorist events, its limitations become obvious with an Ebola-like event. Ebola’s trajectory was not targeted with a symbolic, highly populated urban area in mind, but was subject to the more random whims of individuals’ travel patterns. The first U.S. Ebola patient’s final destination was Dallas, Texas, but it could have been anywhere. The decline of the Metropolitan Medical Response System Program, a former DHS block grant, further jeopardizes biological readiness.

Participants mentioned that allowing state and local jurisdictions more flexibility to direct funds in the most meaningful way for their communities would provide significant benefit. Ongoing efforts by federal grant administrators to synchronize the timing of funding, the covered expenses, and other aspects of DHS, HPP, PHEP, and other grants to reduce administrative burdens on recipients and ensure appropriate coverage of capability gaps are important and overdue.

Hospital Preparedness – A Disconnect

Despite all of the good that the hospital grants have achieved, it seems clear that response as an end goal has not been institutionalized at healthcare facilities. As one survey respondent phrased it, the question is, “Can federal grants align our for-profit hospitals to better prepare to serve the public good and prepare for a biothreat response?”

Minson recommended that a model along the lines of the Joint Commission could help public health grant recipients do just this. The Joint Commission on Accreditation



of Healthcare Organizations (JCAHO, or the “Joint Commission”) is a nongovernmental organization (NGO) that sets standards for hospital accreditation. JCAHO accreditation is used as an unbiased third-party assessment of overall quality and is considered the gold standard benchmark for U.S. hospital quality assessments. JCAHO could add biotreat emergency preparedness and response standards to its accreditation standards. An example to follow could be the American College of Surgeons trauma classification guidelines, implemented by states to create trauma-center designations. These kinds of expert-guided criteria combined with a JCAHO-guided assessment or construct for what a hospital preparedness enterprise must look like could be a feasible framework. The pursuit of this type of third-party approach to hospital preparedness was a foremost recommendation of the meeting.

DomPrep readers were offered three activities and asked to choose which would markedly improve hospital preparedness for biotreats: (a) Increasing grant funding; (b) ensuring grant funds were used for training and exercises; and (c) establishing JCAHO accreditation standards (see Figure 6). Interestingly, only a very small percent – 3.2 percent – indicated that increasing funding to historically high levels would be the deciding factor. The response that received the largest vote was “all of the above” at 52.8 percent; when that is added to the 27.9 percent who specifically chose JCAHO, a remarkable 80.7 percent were on board with the utility of this type of hospital accreditation standard for preparedness.

In many states, HPP funding goes directly to healthcare systems. Clements stated that in Texas, however, it mostly goes to Regional Advisory Councils (RACs). These are 501(c)(3) organizations that coordinate medical preparedness activities with the healthcare

systems and emergency medical services. With this model, a third party is able to leverage preparedness funding to encourage hospitals to work more regionally on preparedness coordination through healthcare coalitions.

Finding Workarounds

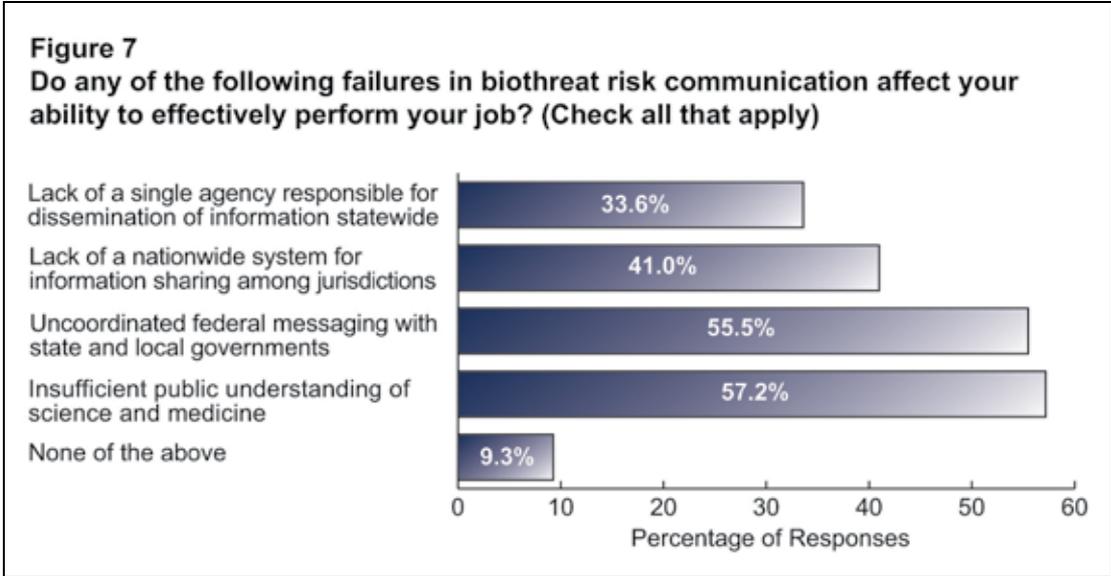
With grant resources at a premium, the roundtable deliberated on ways in which the preparedness community can stretch existing resources and open avenues for other infusions. Finding the means to optimize use of available funds – while it will not solve all biothreat preparedness problems – is a reality the preparedness community must face. Roundtable participants suggested numerous ways to rise to this challenge.

A foremost recommendation was to shift grants from an annual to a multiyear funding cycle. Policymakers should consider much longer-term funding commitments, the way the U.S. Department of Defense's (DOD) funding cycles extend to eight years in some cases. The annual funding cycle is not particularly useful for building systems; longer-term investment planning is required for that. DOD regularly commits on the order of five-year funding for major contracts. Yet, despite the fact that health preparedness is widely considered a matter of national security, the public health infrastructure receives funding in annual increments, “and we're tied up in knots with administrative responsibilities,” said Clements.

He went on to describe that the federal government is much better funded and positioned to build cross-cutting information exchange systems than states and localities. Said Clements of his state, “When we communicate, we use several communication platforms to get hospital bed counts or send out Health Alerts. Instead of each state developing or contracting for these systems, I wish the Feds would... work more towards developing nationally standardized systems.” Clements described a multitude of systems that Texas purchases to allow officials to track items like hospital beds, dialysis patients, or emergency operations, but they cost “a fortune.” “If the Feds would do a multiyear project and create one master system that we can use to manage emergencies, and communicate with stakeholders, and take the annual multimillion dollar burden off of our budgets every year, it would be extremely helpful.”

About 41 percent of survey respondents indicated that the lack of a nationwide system for sharing information among jurisdictions was a problem (see Figure 7). As problematic as this is, uncoordinated federal messaging and lack of understanding of science on the part of the public are greater problems for respondents.

Michael Poole, state Strategic National Stockpile coordinator for Texas, pointed out that the Homeland Security Exercise and Evaluation Program, which provides guiding principles for exercises, recommends a three- to five-year approach to exercise management.

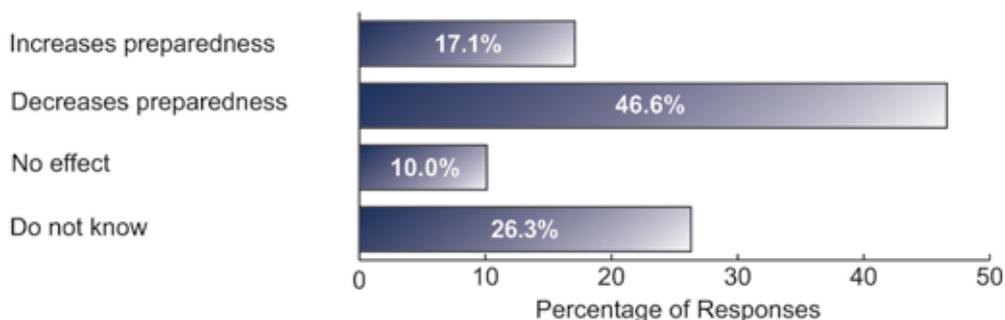


From his experience, the exercises are meant to build upon each other from discussion-based to operational exercises that culminate with a full-scale exercise sometime within years three to five. Yet, the public health preparedness grant funding that pays for this is on a one-year cycle. In a strong funding year, recipients want to utilize the additional funds and jump straight to a full-scale exercise (which can cost more than a million dollars). Although the Centers for Disease Control and Prevention’s (CDC) Strategic National Stockpile exercise requirements have changed to support five-year exercise planning, annual funding cycles do not.

Survey readers were asked how an annual (as opposed to multiyear) funding cycle for appropriations and grants affects preparedness levels (see Figure 8). Almost half indicated that it decreases preparedness, and about 17 percent believe that it increases preparedness. This question about grant cycles and the length of the appropriation is a common theme in grant discussions.

Gerry Parker, D.V.M., Ph.D., M.S., of Texas A&M Health Science Center offered that the absence of a Stafford Act analog for infectious disease means there will be shortfalls, and that another legal mechanism that would allow a similar release of federal funding should be considered. A high-consequence infectious disease event may require the same amount of funding and interagency coordination as a Stafford Act emergency. A public health emergency declaration allows for “emergency use authorizations” for medical countermeasures, but does not open funding streams. Such an emergency may stimulate inappropriate funding requests for “normal” equipment or disposables, as opposed to items that are more unusual and specific to the emergency response at hand. When the Stafford

Figure 8
How does an annual (as opposed to multiyear) funding cycle for appropriations and grants affect preparedness levels?



Act does not apply, another kind of emergency declaration could be used to open funding sources. Policymakers should consider such a statutory or regulatory mechanism.

State and local planners also should consider developing nontraditional funding mechanisms, like resource partnerships with business stakeholders and universities (to tap into their endowments). These could provide not only an alternative source of funds but also a source that may be more flexible than grants.

Social Engagement as a Means of Force Multiplication

In a preplanning discussion for the roundtable, Craig Vanderwagen, M.D., RADM (USPHS), former HHS ASPR, said that resilience is a function of the people in a community and how well they are informed and engaged.

Achieving resilience, therefore, requires a public informed about the risks it faces. Thus, strong recognition of the need for improved education of the public about biothreats emerged from the roundtable conversations. Education and risk communication are not the same, but they are related. As Parker said, the fundamental challenge with a high-consequence infectious disease is that the public does not understand the science, and “we’re going to have to figure out a better way to talk about it.” Many survey respondents seconded this notion.

Yet, no matter how well intentioned and practiced states and localities are in communicating safety and security information, other forces are always at work. An element out of the immediate control of officials is ancillary messaging that emerges from Congress and the press. The 24-hour news cycle is a particular reality of modern emergencies. The biothreat education function needs to be reclaimed by public officials

from the media. Authoritative messaging is perhaps the most important element of risk communication. In the case of Ebola, a lot of mixed messages were given, which was in part a result of insufficient knowledge about the disease; in this case, clear relaying of unknowns was probably as important as what was known. Larry Moore, the information technology sector chief of the Austin (Texas) chapter of InfraGard (a private sector partnership with the Federal Bureau of Investigation that is dedicated to information sharing), offered that one centralized state agency should be responsible for disseminating relevant emergency information at the state level.

The risk communication component of the National Health Security Strategy (NHSS) should be augmented in future iterations. The NHSS is meant to be a driver of policy and strategy, and it should be used to drive the issue of risk communications as one of its top priorities.

Getting at the “Social” in Social Engagement

As with alternative funding, nongovernmental organizations also can help with social engagement and information sharing. Daniel Geraci of the Austin Disaster Relief Network (ADRN) in Texas, described this nongovernmental organization as an example of an organized group that can disseminate information, curtail fear, and leverage its existing volunteer network. Effective grassroots organizations offer longer-term response needs during and after an emergency, helping to maintain social continuity and community cohesion. These types of organizations can be models for sustaining social cohesion in areas where it is at risk. Rurally and in tight ethnic areas, one may see more self-sufficiency. This may not be the case in major cities, and plans and partnerships should be in place with key community groups and leaders. Other relevant organizations mentioned by participants include the Association of Contingency Planners, the Business Continuity Institute, Channel Industries Mutual Aid, and the National Council of ISACs (Information Sharing and Analysis Centers).

Veterinarians were invoked frequently at the roundtable. Participants felt that, as respected health practitioners who understand zoonoses, they should be part of the local emergency planning committees. The specific lack of pre-event planning for zoonotic issues as they pertain to companion animals – as demonstrated by all of the questions surrounding Ebola in canines and what to do about it – highlights a deficit in integrating pet-related issues into preparedness planning. Thomas Zink, M.D., associate professor of environmental and occupational health in the Institute for Biosecurity at Saint Louis University College for Public Health and Social Justice, raised questions such as, “Will we be in a position where we have to choose which species will be forced to survive? Or, through careful and thoughtful preparedness planning, can we do better?”

III. BACK TO BASICS

“We want to be imaginative, but we should apply all that’s already been done.”

–Thomas Zink, M.D., Associate Professor, Institute for Biosecurity at
Saint Louis University College

Despite the challenges to the conventional wisdom that defined the United States’ first domestic experience with human Ebola, fundamental tenets and existing mechanisms are available that, if leveraged, will allow the nation to do better next time. Zink said that the preparedness community may view this crisis and the gaps it has revealed as a call to the routine. There is a desire to be imaginative, but much of the work has already been done. Many lessons have been learned before, and should not have to be relearned. Ignorance of public health rules that have worked historically, like the power of quarantine, is akin to missed lessons from outbreaks past. Zink added that much of the groundwork already has been laid, and planners should trust in the power of traditional public health tools and capabilities that, when executed properly, allow for a successful response. Community groups, which could be force multipliers and key elements of social engagement, are existing resources that should be leveraged. It must be remembered that public health is a team effort.

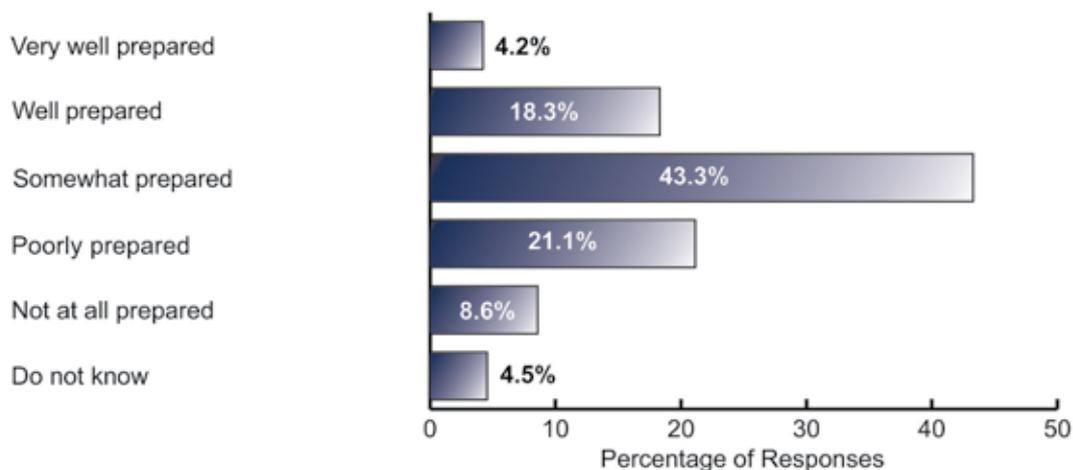
DomPrep readers were posed a rather specific question about their jurisdictions’ preparedness: they were asked to rate them in the context of what they could do in the absence of medical countermeasures (see Figure 9). For a biothreat for which there are no known medical countermeasures and, therefore, measures such as medical surge and emergency communications would be at the forefront of the response, only a quarter felt “well” or “very well” prepared. Yet, specific countermeasures are not available for most threats. Thus, being able to perform other, perhaps more routine or traditional, response capabilities to very high standards is critical.

Training and Exercises

The importance of training and exercises to enable a bioprepared nation cannot be understated. This was well understood in the years following the terrorist attacks of 9/11. Poole stated that his jurisdiction in Texas implemented more than 100 annual exercises via the Strategic National Stockpile Program. Most of the financial support they received for biothreat exercises came from Cities Readiness Initiative funding, a portion of Public Health Emergency Preparedness funding targeted at 72 metropolitan statistical areas.³ More than 90 percent of the Strategic National Stockpile exercises focus on dispensing medical countermeasures. In addition to annual funding limitations, conducting a full-scale distribution exercise becomes challenging with the cost of transportation, increased use

Figure 9

How prepared is your organization to respond to a biothreat for which there are no known medical countermeasures – for example, implementation of quarantines, medical surge management, emergency communications, continuation of services, etc.?



of other state agencies’ resources, and reliance on private partnerships. In leaner times, exercises are occurring less frequently.

An anonymous survey respondent commented that the Ebola situation “exposed overconfidence in many areas and brought the ‘paper plan syndrome’ into the spotlight. Many hospitals and agencies had long-standing infectious disease plans (many of them were quite intricate), but there had been minimal training and exercises done toward testing their effectiveness.” The reduced training and exercises clearly had real-world impacts when it came to Ebola. Moving from paper to action must be a priority.

Although important, training as an end goal does not secure additional or sustained appropriations by itself. This is due in part to a lack of metrics that can be easily associated with the benefits of training. It is difficult to show real results beyond the number of training sessions or hours trained. And yet, more training is needed, and more kinds of training are needed – for example, risk training, PPE, fit testing. In addition, it is important to know who is required to get what training, whether nurses get mask training similar to first responders, and whether healthcare professionals should train to hazardous material PPE standards for biothreats. New and improved policy development on who is required to get what training is critically needed. Ebola has brought to light these basic issues that, if thoughtfully addressed, could lead to meaningful enhancements in preparedness.

Finally, a lot of thought would have to be given to where this training will come from. No one center can do this alone. The Center for Domestic Preparedness, for instance, cannot train an entire nation of responders. State, local, or private agencies and organizations need to come into play, the way Texas A&M Engineering Extension Service (TEEX) does.

Finding Trust

The sense that trust had been lost was a theme that featured prominently in the meeting's discussions. Some said that states and localities no longer trust the CDC anymore, and have stopped listening. They are instead figuring out their own protocols for moving forward.

Public concerns clearly need to be managed more effectively. A lot has been done out of an abundance of caution that has led to mixed public messaging and degraded public trust. Some felt that the CDC has placed more weight on messaging a political response than on its actual public health response. Faced finally with the necessity of a reactionary response, its ramifications could be seen in shifting guidance on PPE and procedures after U.S. healthcare workers were already exposed to and infected with Ebola.

Much of the discussion at the roundtable addressed the importance of, and gaps in, good risk communication. One survey respondent commented, "Risk communication in an Ebola event is almost as critical as infection control measures." Survey respondents were asked if certain potential failures in biothreat risk communication would impact their ability to effectively perform their jobs (see Figure 7). Uncoordinated federal messaging (along with insufficient public understanding of science and medicine) dominated the field of responses. One reader commented that the events of Fall 2014 demonstrated the inability of federal, state, and local agencies to form collaborative, agreed-upon, timely response protocols, as well as the inability to develop a single plan and public message. This, despite more than a decade (since 9/11) of joint planning, partnership developments, and the establishment of legislation that included an individual intended to oversee that coordination (the HHS ASPR).

Furthermore, the discord between words and images on appropriate protective measures degraded public trust. For example, statements that full PPE are required when working with Ebola patients were coupled with images of healthcare providers treating Ebola patients with no PPE at all. The PPE issue was an extremely prevalent theme throughout the written responses to the survey.

These messaging challenges and the degradation of trust that goes with them are a complicated layering of federal, state, and local messaging, activity, and policy differences. Shortly after the roundtable, when the first Ebola case appeared in New York City,

high-ranking state officials (i.e., the governor and his staff) assured the public that it was at no risk at all from the patient who had ridden the subway and visited a bowling alley while ill. Yet, the response included a shutdown and sanitization of the bowling alley.

The degradation in public (and congressional) trust may have been one of the most damaging aspects of the response, but also may be a major lesson that spurs improvement for the next threat. Perhaps there is no “conventional wisdom” when it comes to a disease like Ebola, about which relatively little is known. The critical importance of practicing and implementing baseline infection control measures and other tenets of good public health practice, therefore, is one of the most important lessons that can be learned from the events of 2014.



BioThreat Working Group Roundtable, Texas State Capitol, Austin, Texas, 25 October 2014

KEY FINDINGS

General

- High-consequence infectious diseases are unique and require at least some specialized planning.
- Public health is a team effort, and success requires interdisciplinary and intergovernmental partnerships.
- An outbreak of a high-consequence agent with no known medical countermeasures truly limits the ability of a community and a nation to effectively respond.
- Effective risk communication may be just as important as effective infection control measures.
- Many of the solutions lie in getting back to basics.

Funding and Grants

- Federal funding that is concomitant with the threat and that is sustained is mission critical.
- The decline of funding for the Hospital Preparedness Program and the Public Health Emergency Preparedness Program grants, as well as the elimination of the Metropolitan Medical Response System Program, jeopardize biological readiness.
- Training and exercises have lagged as funds have been cut, which inhibits readiness.
- The annual (as opposed to multiyear) funding cycle for appropriations and grants decreases preparedness levels.
- Ongoing efforts by federal grant administrators to synchronize the timing of funding, the covered expenses, and other aspects of U.S. Department of Health and Human Services and U.S. Department of Homeland Security grants are important and their implementation overdue.

Planning and Preparedness Activities

- Practice and implementation of baseline infection control measures and other tenets of good public health practice is one of the most important lessons that can be learned from the events of 2014.
- Environmental remediation requires deeper levels of planning than had been heretofore considered for high-consequence emerging infectious disease threats.
- The specific lack of pre-event planning for zoonotic issues as they pertain to companion animals is a preparedness deficit with potentially large health and fiscal consequences.

- Response as an end goal has not been institutionalized at healthcare facilities.
- Effective community organizations can offer long-term response capabilities during and after an emergency, helping to maintain social continuity and community cohesion.
- A fundamental challenge with high-consequence infectious disease is that the public does not understand the science, and the public health and preparedness communities must find a better way to talk about it.

Policy Frameworks

- The absence of a Stafford Act analog for infectious disease inhibits preparedness.
- The risk communication component of the National Health Security Strategy is insufficiently prioritized in that document.
- The National Disaster Medical System is very focused on trauma as opposed to infectious disease, which is a greater need.

ACTION PLAN

Recommendations for Action

1. The Joint Commission on Accreditation of Healthcare Organizations (the Joint Commission) should add biothreat emergency response and preparedness standards to its accreditation standards.
2. Public health and preparedness grants should be shifted from annual to multiyear funding cycles.
3. Policymakers should develop a statutory or regulatory mechanism within or outside of the Stafford Act that would allow a similar release of federal funding for public health emergencies.
4. The National Disaster Medical System should consider a shift in focus from trauma preparedness to infectious disease preparedness.
5. The National Health Security Strategy should be augmented to significantly address and prioritize risk communication as a fundamental component of achieving health security.
6. The federal government should take on new policy development for emergency service and healthcare provider protocols for and training in high-consequence infectious disease preparedness activities.
7. The federal government should take on the responsibility of funding and developing an interoperable, national information sharing system that states and localities can use to manage health emergencies.
8. Local officials should develop plans and partnerships with key community groups, religious leaders, and other nongovernmental organizations that can provide force multipliers for funding, resource distribution, data and voice communication, and social cohesion functions.

ENDNOTES

¹Martin Associates. (2012). *2011 Economic Impacts of State of Texas Ports and Maritime Industry*. Texas Ports Association, November 5.

²Lister, Sarah. (2014). *Funding History for Public Health and Hospital Preparedness Grants to States*. Congressional Research Service Memorandum, October 9.

³Cities Readiness Initiative, Centers for Disease Control and Prevention, Emergency Preparedness and Response, <http://www.bt.cdc.gov/cri/>

⁴CNN interview with Thomas Frieden, M.D., M.P.H., Director of the Centers for Disease Control and Prevention, 14 November 2014, retrieved at <http://www.cnn.com/2014/11/14/health/cdc-director-frieden/>

APPENDIX A

Biothreats Roundtable Participants

<i>Lisa Abate</i>	Special Projects Manager	Texas Department of State Health Services
<i>Amy Altman</i>	Vice President Biodefense & Protein Diagnostics	Luminex Corporation
<i>Suzanne Burnham</i>	Senior Veterinary Public Health Specialist	CIDRAP Contractor to DHS, OHA, BioWatch
<i>Ellen Carlin</i>	Principal	Carlin Communications
<i>Bruce Clements</i>	Director, Community Preparedness Section	Texas Department of State Health Services
<i>Kelley Evan</i>	(Ret.)	U.S. Army Veterinary Corps
<i>Scott Fairbairn</i>	President & Section Chief	Austin InfraGard
<i>Daniel Geraci</i>	Executive Director	Austin Disaster Relief Network
<i>Jason Harrison</i>	Survey Team Leader	6th Civil Support Team WMD
<i>Selwyn Jamison</i>	Bioterrorism Prevention Program Manager	Department of Justice/FBI
<i>Larry Jantzen</i>	Battalion Chief	Special Operations/Homeland Security Austing Fire Department
<i>Matthew Minson</i>	Medical Director, Texas Task Force	FEMA-USAR at Texas A&M
<i>Larry Moore</i>	Vice President & Section Chief	Austin Infragard
<i>Kirk Moss</i>	TDCJ Incident Manager	Texas Department of Criminal Justice
<i>Gina Muniz</i>	Director, Emergency Services Program	Texas Health & Human Services Commission
<i>Melody Nunn</i>	Business Continuity Coordinator, Information Security Awareness Trainer	Texas Health & Human Services Commission
<i>Gerald Parker</i>	Vice President, Public Health Preparedness and Response	Texas A&M Health Science Center
<i>Geoffrey Powell</i>	Major	6th Civil Support Team WMD
<i>Denise Rose</i>	Assistant Vice President for Legislative Affairs	Texas A&M Health Science Center
<i>Matt Scullion</i>	Vice President Sales & Marketing	BioFire Defense
<i>Mike Wernicke</i>	Vice President, Commercial Development and Operations	Emergent Biosolutions
<i>Thomas Zink</i>	Associate Professor	Institute for Biosecurity, St. Louis University

APPENDIX B

Contributors

Gary S. Allyn, Fire Chief/Director of Emergency Management, Town of West Hartford Fire Department

Erik Angle, RN, MICN, Emergency Preparedness Coordinator, Sutter Roseville Medical Center

William H. Austin, Deputy Commander, CT Region 3 Incident Management Team; Preparedness Leadership Council International Member

Gerrit Bakker, Senior Director, Public Health Preparedness, Association of State and Territorial Health Officials

Brandi Baros, Environmental Health & Safety Coordinator, Penn State University

Tom Barry, Emergency Management and Training Specialist, CTR HQDA G-34 Protection, Pentagon, Davis Paige Management Systems LLC

Rieley Bennett, Logistics Specialist, MATRAC

Kent Berg, Director, National Institute of Decontamination Specialists; President of Decontamination Professionals International LLC

Chuck Berner, DDS, DABFO, DMORT, FEMORS, OMORT, Forensic Consultant

Jonathan Best, LP, CHPP, CHS-III, Director, Office of Public Health Preparedness and Response, State of Connecticut Department of Public Health

Bill Bollier, Adjunct Instructor, LSU NCBRT ACE, WMD Tech SMART

Marko Bourne, Principal, Booz Allen Hamilton

David W. Bower, Chairman & Chief Executive Officer, DCCA

Constance L. Bowles, RN, MA, Emergency Management, Lee Memorial Health System

Rick Boyer, MPH, Director, Safety & Security South Denver Operating Group, Centura Health

Samuel J. Boyle, Manager of Emergency Management Services, Chicago Department of Public Health

Zuzzette Bricker, ESC, Riverside County Fire Department, Office of Emergency Services

Philip Bucci, Captain, U.S. Army, Chemical Corps

James C. Bundo, EMT Medicare/MUSC of South Carolina

Beth Burgess, Director, Athens-Clarke County Office of Emergency Management, GA

Alan Byrd, Area Coordinator, NC Emergency Management

Chris Cain, Lieutenant, Anne Arundel County Fire Department

Stuart Cameron, Assistant Chief, Suffolk County Police Department

Sean Card, Emergency Preparedness Coordinator-Planner, Nassau County, FL Emergency Management

Manuel Ceja, MD, Medical Director, JFK Advanced Medical

Michael J. Chanat

Tracy Clare, Planning and Training Specialist

Thomas W. Cleveland, Vice President Sales and Marketing, Lifesaving Systems Inc.

Kathleen Conley, M.Ed., LMHC, EP Program Coordinator, San Joaquin County Public Health Services, CA

Lynn Corliss, PHN, PHEP/HPP Coordinator, Siskiyou County Public Health

Gil Cosnett, Medical Preparedness Program Director, Tetra Tech Inc., Northeast Operations

Chad Cossey, EM

Dennis Costin, District Fire Chief, Boston Fire Special OPS Hazmat/CBRNE

Cora Crews, Deputy EMC, City of Friendswood, TX

Lisé Crouch, AEM, PEM, Coordinator, Hendricks County Emergency Management

Patrick Cusick, RS, MSPH, Deputy Commissioner of Environment, Cleveland Department of Public Health

Brannon Davis, Stat Warning Point Manager, South Carolina Emergency Management Division

John E. Donohue II, DHSc., PA-C, DFAAPA

Frances L. Edwards, Dr., Professor, San Jose State University

Kathy Finney, Division Chief of Operations, Roseville Fire Department

Thomas FitzGerald, Director of Public Health, Town of Southwick, MA

Gary A. Flory, Agricultural Program Manager, Virginia Department of Environmental Quality

David Freriks, President, Lincoln Advanced Technologies, Hinckley, IL

Charles Friderici, Emergency Preparedness Specialist, St. Peter's Health Partners, NY

Robert Fruggiero, Senior Decontamination Analyst, ATEC Inc.

Jim Garrett, Operations Technician, Missouri National Guard

David Gerstner, Dayton Fire Department, OH

Benjamin Goings, Emergency Manager, Cobb County Government

Jubenal Gonzalez, Assistant Director of Emergency Management, South Windsor Office of Emergency Management

Michael Gurnick, Lieutenant, Boston Fire Department and Vice Chair, National Association of County and City Health Officials (NACCHO) Medical Reserve Corps Advisory Workgroup

Alex Hammerle, Deputy Director of Emergency Management, City of Sanford, ME

Jay Hammes, CMAA, President and Founder, Safe Sport Zone LLC

Pernell Hammond, EMT/FF, Hazmat Technician, Baltimore County Fire Department

Jeff Harper, U.S. Army, 1SGT (Ret.)
Robert Harter, Department of Emergency Management, City and County of Honolulu

Mark Hastings, RN, Director, Emergency Management, EMS & Trauma Coordinator, Southern New Hampshire Health System

Barry A. Havlik, Mental Health Specialist, U.S. Department of Health & Human Services Office of the Assistant Secretary for Preparedness and Response, Office of Emergency Management National Disaster Medical System

David G. Henry, Homeland Security Consultant, Visiting Scholar and Instructor, Indiana University School of Public and Environmental Affairs

John Herbold, DVM, MPH, PhD, DACVPM, DACAW, FACE, FNAP, University of Texas School of Public Health; Diplomate, American College of Veterinary Preventive Medicine; Diplomate, American College of Animal Welfare; Fellow, American College of Epidemiology; Fellow, National Academies of Practice

Robert Hooks, Director CBRNE Programs, TASC Inc.

Russell Hopkins, Director, NETHealth PHEP

Rodney Hudson, President, QuickSilver Analytics Inc.

Gordon S. Hunter, Major, COANG, Deputy Commander, 8th CST, CO National Guard

Anthony Igo, QA, Regulatory and HACCP Manager, DEN Chelsea Food Services

Douglas C. Jackson, President/CEO, Centurion Solutions LLC

Kathy Jacobs, RN, CHSP, CHEP, Director Environmental Safety, Avera McKennan Hospital and University Health Center, SD

Tory Jennison, RN, MS, Executive Director, Health & Safety Council of Strafford County, Dover, NH

Chris Johnson, BHS, Emergency Management Program Manager, Virginia Mason Healthcare, Seattle, WA

James Johnson, RN, MICN, Paramedic Liaison Nurse, Community Hospital

Scott Johnson, Deputy Chief, Canton Fire Department

Mac Kemp, Deputy Chief, Leon County EMS

Douglas Kinney, Senior Manager (Emergency and Continuity Practice), BDA Global Inc.

Leonard Kotkiewicz, AECOM

Joseph L. LaFleur, Homeland Security and Emergency Management Subject Matter Expert, GP Strategies Corporation; Former State Emergency Management Director for Pennsylvania and Wisconsin; Former FEMA Senior Executive

Scott Lancaster, Deputy Fire Coordinator, Monroe County HazMat Response Team

Leonard A. Levy, Dr., Associate Dean for Education, Planning and Research; Director, Institute for Disaster and Emergency Preparedness, Nova Southeastern University College of Osteopathic Medicine

Neil C. Livingstone, Ph.D., Chief Executive Officer, ExpertOutcomes/Protect International

William A. Lorenzen, MS, Manager, Research Laboratory Support, Radiation Safety Officer, Boston Children's Hospital

Robert MacKay, Wantagh Fire Department

Michael J. Magda, Lieutenant, Western Wayne County HMRT/Livonia Fire & Rescue

Jason Mahoney, Emergency Preparedness Coordinator, St. Vincent Healthcare, MT

Joe D. Manous Jr., PhD, PE

Justin Mast, Crisis & Continuity Advisor, MESH

Bob Mauskopf, MPA, Colonel USMC (Ret.), Director Emergency Preparedness, VA Department of Health, VA EVD Unified Command Director of Planning

William Maynard, Manager, Mass. General Hospital

Robert McCreight, Adjunct Professor, Penn State University

Joseph G. McDowell Jr., Chief of Police, Barnstead, NH Police Department

Michael McKinney, Chief Medical Training Officer, Emergency Preparedness "FIRST"

Randy McLeland, Public Health Preparedness Planner, Central District Health Department, Boise, ID

Jose Mendez, Radiation Safety, Inova Fairfax Medical Campus

Kaitlyn Meyers, Graduate Student, George Mason University

Robert Mitchell, M.D., Medical Director Disaster Medicine Project, Snohomish County (WA) Fire District 1

Robert A. Mitchell, CFO, CEMSO, FPEM, Assistant Chief-Operations, Reddy Creek Emergency Services, FL

Cindy Mohat, Emergency Management Coordinator, University of Texas at Arlington

Sue Mohnkern, RN, MPH, Public Health Emergency Preparedness Program Supervisor, Washington County DHHS, OR

Thomas R. Murphy, Emergency Responder, American Red Cross, New York City Office of Emergency Management

Sherrie Nash, DVM, NDMS

Lawrence Nelson, MS, NMCEM, Director, Emergency Management Program, Eastern New Mexico University

Linda Noson, Emergency Preparedness Coordinator, Missoula City-County Health Department

Michael O'Connell, Deputy Director, Anne Arundel County Emergency Management

Thomas O'Connell, DPH Liaison to Hazmat Response Division, MA Department of Public Health

Sudhir Oberoi

Steven J. Pawlak, Senior Manager-Emergency Readiness, Port Authority of New York and New Jersey, Office of Emergency Management

Kenneth Eric Pickering, Deputy Operations Chief, New Orleans Office of Homeland Security & Emergency Preparedness

Brenda Pittman, EMS & CISM Coordinator, Lancaster County EMA

Michael Poole, State SNS Coordinator, Texas Department of State Health Services

Lisa Powell, MPS, TLO, Emergency Preparedness and Response Program Manager, El Paso County Public Health

Robert Price, Lead Associate, Booz Allen Hamilton

Barbara Prince, Safety Officer at CHOC Childrens Hospital, Orange, CA

Richard Proctor, Health Officer, Department OEM Coordinator, City of Rahway, NJ (Ret.)

Melissa Reed, BA, MA, Emergency Management Specialist, Homeland Security Public Health Preparedness

Andrew Reeve, President and CTO, Siliconwarrior

Stephen V. Reeves, Major General, U.S. Army (Ret.)

Donald Renn, Preparedness Coordinator, Bullitt County KY Health Department

J. Rigg, EMTP, Ross EMS, Operations Supervisor

Lawrence Roberge, Dr., Professor, Laboure Collehe, Milton, MA

Kevin Romero, Vice President of Operations, Regional EMS Authority REMSA, NV

Barbara Rosvold, Director Public Health Preparedness, Frederick County Health Department, MD

Scott Russell, Hazmat/Fire Captain, Baltimore County Fire Department

Tomas R. Sanchez Jr., Emergency Management Coordinator, Kleberg County, TX

Wilborn Sargent Jr., Emergency Manager, Detroit VA Healthcare System

Robert Satterlee, Outside Sales, Fridge Freeze, Bio Fridge (Portable Medical Refrigeration)

Zach Schmitz, Management Analyst, City of Woodinville, WA

Robert M. Serino, Ph.D, Director of Operations, Science and Engineering Services, MD

Ntasiah K. Shaw, MS, Regional Emergency Response Planner, St. Louis County Department of Health

Ricky L. Shellenbarger, CEM, Sedgwick County Emergency Management

Karen Smith, Public Information Officer, Monterey County Health Department

Regina D. Smith

Buck Somes, Chief Executive Officer, GenPrime Inc.

Terry Storer, Deputy Director, Logan County (IL) EMA

Jeff Straub, CHEP, System Emergency Manager/Safety Officer, Spartanburg Regional Healthcare System

Zsolt Szoke, Captain, Charleston Fire Department, SC

Vivienne Treharne, BSN, RN, Registered Nurse Consultant, Florida Department of Health, Bureau of Preparedness and Response-Logistics Unit-RM

Jo (Margaret) Velardo, Ph.D., Director of Research, Fellow in Biodefense, Homeland Security Studies and Analysis Institute

Chris vonWiesenthal, Captain, Special Operations Division, Haz-Mat Coordinator/Rescue Specialist, Cy-Fair Fire Department, Harris County (Houston), TX

Ben Waller, Battalion Chief, Hilton Head Island Fire Rescue, SC

Stephanie Ward, EMT-B, Townville Ambulance

Susan Webb, RN, Emergency Preparedness Coordinator, Sutter Auburn Faith Hospital, CA

Paul Weichselbaum, President, Metropolitan Medical Response System National Leadership Group

Michael D. Whalen, BSN, CEM, President, Emergency Educators LLC

Harold R. Wolgamott, Deputy Emergency Services Director, City of Gonzales, CA

Don Wyatt, RN, EMS Liaison

Sheryl H. Wynn, MSPH, Emergency Response Planner and Accreditation Coordinator, Greene County Combined Health District, OH

Carl Yetter, Lieutenant, HAZMAT Technician, Anne Arundel County Fire Department (AACoFD), Special Operations

APPENDIX C
Preparedness Leadership Council (PLC)

Executive Committee



Marko Bourne
Principal, Booz Allen Hamilton



Vayl S. Oxford
National Security Executive Policy
Advisor, Pacific Northwest National
Laboratory



Kenneth P. Rapuano
Director of Advanced Systems and
Policy, The MITRE Corporation



Stephen Reeves
Major General, U.S. Army (Ret.)



James Schwartz
Chief, Arlington County Fire
Department



Robert Stephen
Executive Director, Gryphon
Scientific LLC



Craig Vanderwagen, M.D.
Senior Partner Martin Blanck and
Associates

Policy Committee



Elizabeth B. Armstrong
Chief Executive Officer, International
Association of Emergency Managers



Ann Beauchesne
Vice President, National Security &
Emergency Preparedness Department,
U.S. Chamber of Commerce



Timothy Blute
Senior Policy Analyst, Homeland
Security & Public Safety Division,
National Governors Association



Ellen P. Carlin, D.V.M.
Principal, Carlin Communications



Amy Kircher
Director, National Center for Food
Protection & Defense



Linda Langston
President, National Association of
Counties



John Morton
Senior Strategic Advisor

PLC Members



Amy Altman
Vice President Biodefense, Luminex



Charles J. Guddemi
Federal Law Enforcement Officer



James J. Augustine, M.D.
Emergency Physician, Clinical Associate
Professor, Wright State University



Michael K. Hamilton
CEO & Managing Partner, MK Hamilton &
Associates



William Austin
Homeland Security Coordinator, Connecticut
Capitol Region Council of Governments



Robert P. Kadlec, M.D.
Managing Director, RPK Consulting LLC



Megan Clifford
Deputy Director, Infrastructure Assurance
Center, Argonne National Laboratory



Douglas Kinney
Business Continuity/Continuity of Operations
Consultant, BDA Global LLC



Kenneth W. Comer, Ph.D.
Associate Professor, George Mason
University



Stanley Lillie
Brigadier General, U.S. Army (Ret.)



John Contestabile
Assistant Program Manager, Homeland
Security, Johns Hopkins University/APL



Anthony S. Mangeri, Sr.
Manager of Strategic Relations for Fire
Services & Emergency Management, APUS



David W. Cullin, Ph.D
Vice President, Research, Development &
Programs, FLIR Systems Inc.



David R. Matthews
Founder, Cyber Incident Response
Coalition & Analysis Sharing Group



Craig DeAtley
Director, Public Health Emergency Readiness,
MedStar Washington Hospital Center



Matthew Modarelli
Cyber Security Manager, Washington State
Emergency Management Division



Kay C. Goss
Chief Executive Officer, GC Barnes
Group LLC



David M. Olive
Founder & Principal, Catalyst Partners LLC

PLC Members



Gerald Parker, D.V.M., Ph.D., M.S.
Senior Vice President, Disaster Cycle
Services, American Red Cross



Steven L. Stein
Director, Pacific Northwest National
Laboratory



Joseph Picciano
Former Deputy Director for Preparedness, NJ
Office of Homeland Security & Preparedness



Timothy Stephens
CEO, MESH Coalition



Richard Reed
Senior Vice President, Disaster Cycle
Services, American Red Cross



Maureen Sullivan
Supervisor, Emergency Preparedness &
Response Laboratory Unit, Minnesota
Department of Health Public Health Laboratory



Andrew Roszak
Senior Director for Environmental Health,
Pandemic Preparedness & Catastrophic
Response, NACCHO



Gent Welsh
Colonel, Chief of Staff, Washington Military
Department & Washington National Guard



Glen Rudner
Instructor, Security & Emergency Response
Training Center



Mike Wernicke
Vice President, Commercial Development &
Operations, Emergent BioSolutions Inc.



Jeff Runge, M.D.
Managing Member, Vigilant LLC



Kelly Woods Vaughn
Managing Director, Infragard National
Members Alliance



Matt Scullion
Vice President Sales & Marketing,
BioFire Defense



Thomas K. Zink, M.D.
Associate Professor, Environmental &
Occupational Health, Institute for Biosecurity,
Saint Louis University



Lori Sparks
Principal, Booz Allen Hamilton

APPENDIX D

Demographics of DomPrep Respondents

In what sector are you employed?	
	Percentage of Responses
Fire Service	11.7%
Law Enforcement	1.0%
EMS	4.5%
Emergency Management	24.3%
Public Health	14.4%
Hospital (including VA)	9.0%
Federal Government	1.8%
Military	3.6%
State/Local Government	4.5%
Nongovernment Organization (NGO)	2.7%
Privately Owned Company	8.1%
Publicly Traded Company	1.8%
Self-Employed	4.5%
Not Employed	0.0%
Academic Institution	6.3%
Student	1.8%

What type of position do you hold?	
	Percentage of Responses
Upper Management	33.6%
Middle Management	22.1%
Operations	16.8%
Technical	2.7%
Training	7.1%
Administration	4.4%
Other	13.3%

“We learned that the situation wasn’t going to be as simple or as controlled as we thought it would be, and we immediately intensified our response to address the situation in Dallas.... I think we didn’t recognize how hard it would be to care for someone with Ebola who was desperately ill in the U.S., and how much hands-on nursing care there would be, and we didn’t expect two nurses to get infected.... When two healthcare workers became infected, we recognized the guidelines didn’t work. So we changed them.... I wish I had known then what we know now. But that’s not how the world works. We live life forwards and we understand it backwards. Looking back with 20/20 hindsight, there are always things we would do differently.”

*–Thomas Frieden, M.D., M.P.H., Director,
Centers for Disease Control and Prevention, in an
exclusive interview with CNN, 14 November 2014⁴*

Underwriters

Booz | Allen | Hamilton

100 YEARS

Luminex

BIO  FIRE
DEFENSE

 **FLIR**

protected by **emergent**
biosolutions™