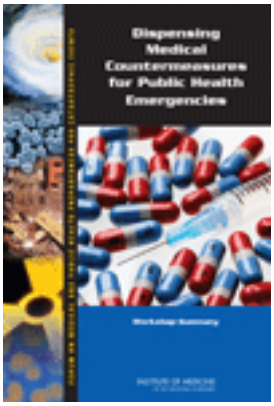

Dispensing Medical Countermeasures for Public Health Emergencies: Workshop Summary

Miriam Davis, Marnina S. Kammersall, and Bruce M. Altevogt, Rapporteurs, Forum on Medical and Public Health Preparedness for Catastrophic Events, Institute of Medicine

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Miriam Davis, Marnina S. Kammersell, and Bruce M. Altevogt,
Rapporteurs

Forum on Medical and Public Health Preparedness for Catastrophic Events

Board on Health Sciences Policy

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Willing is not enough; we must do."
—Goethe

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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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tain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

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Workshop Summary

INTRODUCTION[1]

Medical countermeasures are vital to protect the public against acts of terrorism and other public health emergencies. The need for an effective system of dispensing medical countermeasures gained recognition in 1979 after the accidental release of radionuclides from the Three Mile Island nuclear power plant in Pennsylvania. If emissions had been higher, widespread dispensing of the countermeasure potassium iodide would have been necessary to prevent future cases of thyroid cancer among those living nearby or downwind. More than two decades later, in the fall of 2001, America witnessed its first bioterrorist attack of *Bacillus anthracis* (anthrax), spread by the bacterium's spores on contaminated mail. Although the death toll from the 2001 anthrax attack was limited,[2] with only five deaths across six locations nationwide, more than 32,000 potentially exposed people received prophylaxis with oral antibiotics.

Since 2004, the Cities Readiness Initiative (CRI) has addressed the threat potential of an outdoor anthrax dissemination in a large metropolitan area, including the countermeasure distribution and dispensing requirements of states and certain metropolitan jurisdictions. In addition, the program, operated through the Centers for Disease Control and Prevention (CDC), has provided guidance, funding, technical support, and program advisory for 72 jurisdictions to date. The CRI aims to improve the capacity of state and local jurisdictions to deliver medication and

[1]The planning committee's role was limited to planning the workshop, and the workshop summary has been prepared by the workshop rapporteurs as a factual summary of what occurred at the workshop.

[2]Of 22 documented anthrax cases across the nation, 11 were by inhalation and 11 were by cutaneous exposure.

medical supplies during any large-scale public health emergency. The CRI acknowledges, and aims to address, the requirements associated with a window of only 48 hours from the time the decision is made to start countermeasures to the time they are actually dispensed. Responding to an anthrax attack is one of the most demanding of all of the vast public health emergencies in both scope and task. Although it is just one of the many threats facing public health, anthrax was the primary focus of the workshop discussion.

WORKSHOP DEFINITIONS, GOALS, AND OBJECTIVES

With the threat of an anthrax attack as the case study, on March 3–4, 2008, the Institute of Medicine (IOM) Forum on Medical and Public Health Preparedness for Catastrophic Events hosted a workshop titled "Medical Countermeasures Dispensing." The workshop was organized by an independent planning committee. The following is a summary of the presentations and discussion that transpired during the workshop.[3] Any opinions, conclusions, or recommendations discussed in this workshop summary are solely those of the individual persons or participants at the workshop and are not necessarily adopted, endorsed, or verified by the Forum or the National Academies. The overall workshop objective was to review a range of solutions to provide medical countermeasures rapidly to large numbers of people to protect them before or during a public health emergency, such as a bioterrorist attack or infectious disease outbreak. In particular, the workshop goals were to: identify and discuss the most promising methods for dispensing medical countermeasures as well as their inherent strengths and challenges; identify near-term opportunities for promoting efficient and effective dispensing mechanisms at the state and local level; and to bring invested stakeholders (including local, state, federal, nonprofit, and corporate representatives) together to discuss these methods, opportunities, and challenges. Dispensing refers to the delivery of medical countermeasures to the population. Distribution, on the other hand, refers to transporting Strategic National Stockpile (SNS) assets (including vendor managed inventory) from its original location to the state receiving, staging, and

[3]To download presentations or listen to audio archives, please visit http://www.iom.edu/CMS/3740/42532/50909/52001.aspx.

storing (RSS) warehouses, as well as the receipt, staging, storage, and transportation of materiel from the RSS warehouses to dispensing sites (see Box 1 for a glossary of key terms).

Dispensing methods under discussion at the workshop were aimed at prophylaxis (prevention of illness), rather than at treatment (medical efforts to treat symptomatic individuals). Prophylaxis was described as one way to prevent mass casualties and to avoid overburdening and incapacitating a health care system that is ill equipped for treating mass casualties. Under the broad objective of prophylaxis, workshop participants were specifically asked to: (1) highlight challenges that arise in the current programs of dispensing of medical countermeasures, especially antibiotics against anthrax, which must be given within 48 hours of the

BOX 1
Glossary of Key Terms

Distribution: The activity associated with the delivery of federal SNS assets from their original location to the state receiving, staging, and storing (RSS) warehouses, as well as from the RSS warehouses to dispensing sites, alternate care facilities, and regional distribution sites/nodes.

Dispensing: The activity associated with providing prophylaxis and other related medical materiel to an affected population in response to a threat or incident. This activity, which is conducted on the local level, is the final interface between provider and public.

Points of dispensing (PODs): Locations where medical countermeasures are dispensed to the affected population. PODs may be *open*; that is, they are public sites visited by the at-risk population who have been directed to report to that site to pick up medical countermeasures. PODs may be *closed*; that is, they dispense medications to a select or pre-defined population, not the general public. Closed PODs dispense countermeasures to identified staff, family members, patients, contacts, and/or specific groups outlined in the provider's mass prophylaxis dispensing plan. Independent of a closed or open POD, a POD may also be "medical" or "nonmedical." A medical POD would mostly be staffed by medical personnel, who would primarily be responsible for dispensing medication and conducting medical exams and triage procedures to determine whether cases are in the incubation stage or in need of hospitalization. In contrast, a nonmedical POD would be staffed by trained but nonmedical personnel, who would dispense medication and triage as appropriate, but would not conduct individualized medical assessments.

decision to so in order to minimize casualties; (2) discuss potential innovations, tools, technologies, and frameworks available from sectors outside the traditional public health system; and (3) explore potential public–private partnerships that are indispensable for expanding the capacity to dispense countermeasures in a short time frame.

The scenario used for discussions during the workshop was an anthrax attack because such an attack already occurred in the United States, and it thus provides valuable empirical data on what measures worked and what challenges arose. The anthrax attack also presents public health planners with extreme logistical challenges, including the short time line essential for effective prophylaxis and the size of the potentially exposed population (tens of thousands). For these reasons, the lessons learned from and extrapolated to a widespread dissemination of anthrax—deemed by CDC to be among the most perilous types of bioterrorist agents—may be applicable to other types of bioterrorist attacks or public health emergencies.

CURRENT CHALLENGES AND THREATS

Public health emergencies such as an intentional anthrax release, or infectious disease threats such as severe acute respiratory syndrome (SARS) and pandemic influenza, highlight the ever-changing threats posed by acts of terrorism and other public health emergencies, while also underscoring the pressing reality of these events. However, these events present different stresses on the public health community. As discussed during the workshop, a bioterrorist event such an anthrax attack represents a deliberate attack that threatens our national security and our public health. A naturally occurring event such as an influenza pandemic is a public health crisis with national security implications (due to the numbers who might become ill—armed forces, public safety workers, etc.). Therefore, the key is for the nation to plan aggressively to counteract the threat of future public health emergencies, said Dr. Gerald Parker, the principal deputy assistant secretary in the Office of the Assistant Secretary for Preparedness and Response at the Department of Health and Human Services (HHS). However, he asserted, the United States is unprepared to confront the full range of threats.

Another presenter noted that one of the main criticisms leveled at the federal government by the 9/11 Commission was a "failure of imagination," underscoring the point that the government did not anticipate the

nature of the threat and thus had no systems in place to counteract it. Many other presenters sounded the alarm that the public health system has been beleaguered since the 1980s (IOM, 1988) and is inadequately staffed for a widespread attack. Issues presented at the workshop as impediments to successful, comprehensive antibiotic countermeasure delivery to the population included labor, physical facility capacity, security, liability, and financial sustainability.

The anthrax example, Parker said, dramatically brings to light the seriousness of the threat and the nation's lack of preparedness in two major ways. The first is the need to dispense countermeasures within an extremely short time window to minimize morbidity and mortality from anthrax. The second is the allure of anthrax or other biological toxins (e.g., ricin) to terrorist groups because of their relatively low cost and ease of production and dispersal. Many existing technologies can be used to disperse aerosolized forms of these agents over massive and heavily populated areas, posing a risk to hundreds of thousands of people (Baccam and Boechler, 2007).

Distribution of Medical Countermeasures: The Strategic National Stockpile

The magnitude of the challenge facing America requires experience in the logistics of wide-scale distribution and dispensing of countermeasures by all levels of government, and the private sector's assistance is also crucial. The SNS, which was first established in 1998 as the National Pharmaceutical Stockpile, is a national repository of medicine and medical supplies. The stockpiles are strategically located around the United States to ensure that once federal and local authorities agree that SNS deployment is needed, "12-hour push packs" of medications and/or supplies can be delivered to any designated receiving and storage site within 12 hours, while other managed inventory can be in place within 24 hours of the decision to deploy. Once the SNS materiel arrive at the designated site, state and local authorities assume responsibility for the materiel and oversee storage, distribution, and dispensing (CDC, 2008). Under this division of responsibility, the largest challenges and gaps are at the local level. It is widely believed that upon activation, the federal government would be able to distribute the necessary SNS materiel to state and local agencies within 12 to 24 hours. Public health officials could then begin dispensing from local caches, thus meeting the ideal

dispensing time frame of 12 to 36 hours from SNS activation. However, most communities still lack adequate mechanisms and capacity to expeditiously dispense countermeasures to all of the exposed and potentially exposed populations, Parker said.

Dispensing Medical Countermeasures

The demands on local governments are extensive, and local officials may benefit from partnering with other sectors to develop solutions, noted Gregory Burel, the Senior Executive Service Director, Division of Strategic National Stockpile, CDC. A joint government–private partnership or a "community" response with government leadership is necessary to ensure the most positive outcome. The CRI, for example, provides federal pre-event or planning leadership through a federal program aimed at providing selected cities with technical assistance to expand their capacity to dispense countermeasures within this 48-hour window. Even so, it is important to acknowledge that the actual operational requirement still rests with state and local entities, and that is where the intergovernmental and nongovernment liaison is paramount. As will be highlighted throughout this document, public–private partnerships may be leveraged to assist in these efforts.

Challenges and Moving Forward

Countermeasure dispensing must harness all types of imaginative partnerships between public and private institutions, working together in ways tailored to individual community needs, Parker asserted. The challenge requires incentives for and commitments from the private sector to enter into innovative partnerships with government agencies, with benefits to each partner. Several presenters emphasized that community-level planning, capacity, training, and response would be improved by collaboration between public and private sectors.

Countermeasure dispensing at the local level depends on new and creative types of local partnerships, Parker said. Whatever their configuration, partnerships must be geared to each community's needs. The public health system as a whole must also address the major gaps and obstacles to local dispensing of countermeasures, such as liability protection for participation by private partners, communication with the public,

and security around dispensing sites. The task ahead is fundamentally important to national security and public health, Parker concluded.

CURRENT PLANS AND GAPS REGARDING MEDICAL COUNTERMEASURE DISPENSING

Under the current system, the dispensing of medical countermeasures at the local level is the final step in a complex and interactive process starting with federal, state, and local public health programs. For the system to work effectively, participants must understand the urgent nature of the public health threats, such as anthrax. For example, anthrax produces spores that enter the body through the lungs, mouth, or skin. After the initiation of symptoms, death can occur as quickly as two or three days, with a high percentage of mortality among those infected, said Dr. Sid Baccam of Innovative Emergency Management. Consequently, anthrax exposure requires prophylaxis by oral antibiotics promptly after exposure, optimally within 48 hours, and before symptoms arise. Once someone becomes symptomatic, he or she must be treated because if the individual becomes ill and does not receive timely treatment, the fatality rate approaches 100 percent. Even with supportive care in the hospital, symptomatic inhalational anthrax cases are approximately 50 to 75 percent fatal (CDC, 2003; Inglesby et al., 1999). Therefore, due to the significant risk, standard public health procedures call for erring on the side of prudence and administering antibiotics to everyone who might have been exposed, even before symptoms are apparent.

The short time window for preventing illness after anthrax exposure compels the public health system to respond as swiftly as possible to deliver post-exposure prophylaxis (PEP). As described by Baccam, optimal management of the health effects from a bioterrorist attack includes rapid action, progressing in stages known as the four "Ds": *detect, decide, distribute, and dispense*. The ability to rapidly detect an anthrax exposure, decide on deployment of the SNS, distribute countermeasures to state and local health authorities, and dispense to affected populations within 48 hours of the decision to do so requires herculean efforts.

In the anthrax scenario, the federal government is responsible for procuring and stockpiling the antibiotics (among other countermeasures), according to legislation requiring CDC to establish SNSs of medical countermeasures throughout the country. Once the attack is detected and the decision is made to transfer stockpiled antibiotics to the states, state

governments distribute antibiotics within their borders to pre-designated sites established primarily by local governments as "points of dispensing" (PODs). Most local governments, their partners, or other organizations expect to dispense the majority of countermeasures from PODs to large groups of people. Each locally designated POD, in other words, receives its countermeasures from state authorities, which in turn have received them from the SNS (CDC, 2008).

This workshop focused on the final step in the process: medical countermeasure dispensing from PODs and via alternative mechanisms to their populations. Public health planners have used PODs as the major framework for planning countermeasures dispensing, yet PODs pose some of the greatest challenges, including their location, design, operations, capacity, workforce, and a host of other factors.

Dispensing Medical Countermeasures: Time Considerations

The foremost problems arise from delays in starting and completing the initial dispensing of prophylaxis. Speaker Baccam illustrated that even short delays have striking effects on morbidity and mortality, according to various models (Baccam and Boechler, 2007). At the local level, where dispensing occurs, the degree of morbidity and mortality is impacted by at least three factors: (1) the time of onset of a post-exposure prophylaxis campaign (i.e., the time to deliver the initial pill), (2) the capability in completing the campaign (i.e., the time to deliver the last pill), and (3) the capacity of nearby hospitals to treat symptomatic patients. Symptomatic people need to be treated in hospitals. A community with limited hospital bed capacity will be completely overwhelmed with a high caseload and thereby experience greater mortality.

The three local factors were modeled by Baccam in hypothetical scenarios shown in Figure 1. In Case A, which is the most effective case, the prophylaxis campaign starts on Day 1 and is completed by Day 2. In Case B, the campaign starts on Day 2.5 and is less efficient, taking 4 days to complete. The unmarked black line in Figure 1 illustrates the time frame over which infected people, if there is no prophylaxis campaign, will progress from the incubation period to becoming symptomatic. In the absence of PEP, all infected people become symptomatic (Inglesby et al., 1999). In Case A, 100 percent of infected people are still in the incubation stage when they receive prophylaxis; they are prevented

from becoming symptomatic and thus do not need hospital care. In Case B, nearly 100 percent of infected people are still in the incubation period when the campaign is started, but they become symptomatic due to the inefficiency of the PEP campaign. This lack of efficiency is, in other words, linked to how many people are served by the PODs and other methods over a set period of time, that is, the throughput. The consequence of delays in starting the PEP campaign—and the longer duration of initiation of the PEP campaign in Case B—is that more than 50 percent of infected persons become symptomatic and thus need hospital care, noted Baccam. Whether their lives will be saved depends on the community's hospital capacity and availability of treatment. The end result of these two hypothetical scenarios is that a delay of a *mere* 1–2 days in start-up time has profound effects on the efficacy of the campaign, with up to 50 percent more morbidity and mortality in the hypothetical cases depicted here (see also Baccam and Boechler, 2007). However, degeneration of the hospital capability is not fully represented in its impact.

Another speaker, Dr. Nathaniel Hupert of Weill Cornell Medical College, discussed the relationship between the expected surge in hospital admissions after an anthrax attack and the tactics used in POD-based antibiotic dispensing campaigns. His model, the Regional Hospital Caseload Calculator, uses two factors to determine outcomes: the delay until starting dispensing (or "time to first pill") and the duration of the campaign once started (or "time to last pill"). Within the first week after an anthrax attack, shortening the "time to last pill" can be expected to decrease hospitalizations by 2 to 6 percent for each day saved. Using the Caseload Calculator in conjunction with another Cornell model, the Bioterrorism and Epidemic Outbreak Response Model, he calculated that achieving these reductions in hospitalization may require up to a 33 percent increase in POD throughput, which will have important human resource implications for preparedness planning.

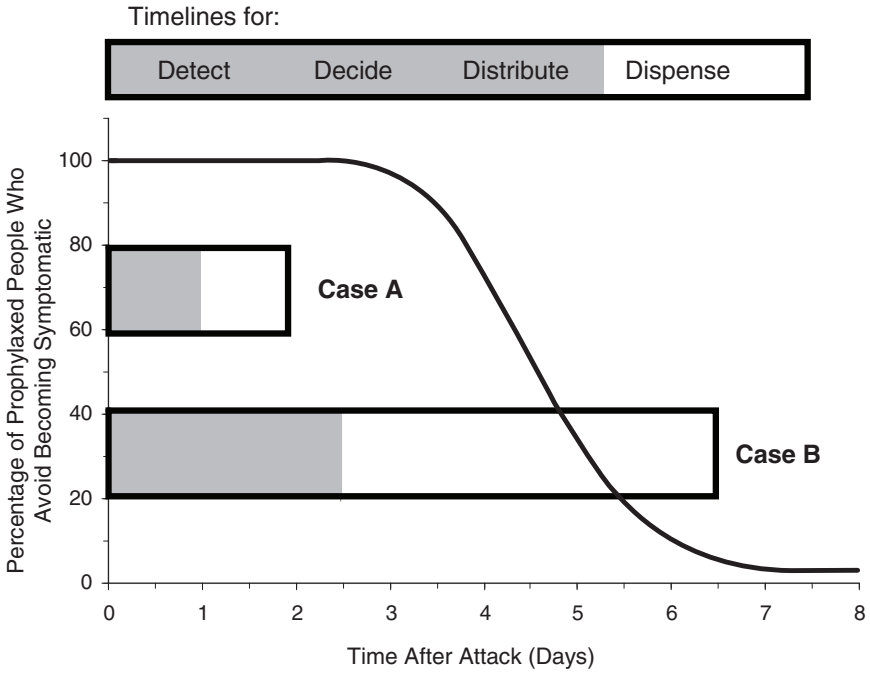

FIGURE 1 Timelines for the 4 Ds—detect, decide, distribute, and dispense—in two hypothetical scenarios. The 4Ds are critical in determining how well we mitigate an intentional release of anthrax through mass prophylaxis. SOURCE: Baccam (2008).

POD Models

Cities Readiness Initiative

The focus of the federal efforts to dispense medical countermeasures has been through the Strategic National Stockpile, as described by Burel. "12-hour push packs" are in place near major population centers. One of CDC's core functions related to stockpiling is to advance the CRI.[4] As recently as 2003, there were few PODs and no alternative dispensing sites, which are crucial to enhancing dispensing capacity. The goal of the CRI is to provide, in concert with responsible jurisdictions, mass prophylaxis to 100 percent of an exposed or potentially exposed population

[4]For more information about the CRI, visit http://www.bt.cdc.gov/CRI/.

within 48 hours of the decision to do so. Today, the CRI has extended its reach to 72 locations covering 57 percent of the U.S. population, Burel said. Those cities have already designated 3,500 PODs. The CRI is strengthening POD infrastructure with state and local partners through technical assistance, including training, electronic mailing lists (listservs), management practices, education of the public via satellite broadcasts, and advice on security to enforce public safety around PODs. The CRI is experimenting with POD structures of many types, including "pull" and "push" mechanisms. Pull mechanisms require the general public to come pick up the countermeasure from open PODs, e.g., drive-through clinics or clinics established at schools, where as push mechanisms involve state and local officials pushing the countermeasures out to entities that are then responsible for delivering the countermeasure to specific populations. For example "push" mechanisms through which countermeasures are delivered to residences through social services, such as Meals on Wheels and home health care, or using the U.S. Postal Service to deliver countermeasures to individual residences. Several of these concepts, including pull and push mechanisms are discussed in greater detail in the next section.

Medical and Nonmedical PODs

In addition to the time of initiation and the duration of the campaign, there are a host of other features for localities to consider in the design and operation of their PODs, as discussed by a number of speakers including Baccam, Burel, and Hupert. One is the location of the POD. Localities are expected to position their PODs at accessible sites (typically sites used for voting), such as high schools, large auditoriums, or elementary schools, in ways that best serve the local community. Another key question is who staffs a POD and how many PODs and staff will be required. There are two types of POD designs, medical and nonmedical. A medical POD would mostly be staffed by medical personnel who would primarily be responsible for dispensing medication and conducting medical exams and triage procedures to determine whether cases are in the incubation stage or in need of hospitalization. In contrast, a nonmedical POD would be staffed by trained but nonmedical personnel, who would dispense medication and triage as appropriate, but would not conduct individualized medical assessments.

The medical POD structure is similar to the way that medicines are dispensed in the absence of an emergency, using trained medical professionals to interact with and assess individual patients. Although this model is consistent with current standards of care, medical PODs have several drawbacks, including the need for a large number of medical staff during a time when they will be needed to handle an expected surge of ill patients. Simulations, as well as an actual exercise in Texas, have estimated that a medical POD has a typical throughput of approximately 500 patients per hour, a rate that is likely too slow to prevent mass casualties. In a target city of one million, approximately 6,000 staff (including nearly 2,000 medical personnel) would be needed to complete a medical POD system in two days.

A nonmedical POD system, on the other hand, provides care using a population approach; no individual medical examinations or assessments are conducted. During an emergency, it was noted that the situational standards of care would likely be altered and it may not be possible to screen every individual based on standards of care that are in place during nonemergency situations. As described by Baccam and other speakers, the value of the nonmedical POD is its increased efficiency. A nonmedical POD can dispense countermeasures to an estimated 2,000 patients per hour, and would need approximately 1,400 staff (including nearly 50 medical personnel) in order to complete mass prophylaxis for a city of one million. Thus nonmedical PODs were described by many workshop participants, including Michael Robbins of the Chicago Department of Public Health, as the preferred approach because they can deliver countermeasures even though every person is not seen by a health professional. Nonmedical PODs can optimally dispense countermeasures at a rate that is approximately *four* times greater than that of medical PODs, while requiring only approximately one fourth the total number of staff and much fewer medical personnel. Moreover, as mentioned above, using nonmedical staff at PODs would allow medical personnel to attend to those who are already symptomatic. A city could also use a range of public service announcements to divert symptomatic people away from PODs and into hospitals, thereby reducing the need for triage at the POD.

However, staffing challenges for nonmedical PODs remain. As speaker Mary Steiner of the Oklahoma City–County Health Department pointed out, even volunteers who have confirmed their willingness to staff a nonmedical POD may not be sufficiently reliable. In her experience from running emergency preparedness exercises, as few as 25 percent of volunteers may actually show up when called. This may suggest

the need to staff nonmedical PODs using paid, nonmedical personnel from the public or private sector, such as nonessential state and local employees, Steiner said. Nonmedical PODs need not be uniformly designed across all communities, but should be designed to meet the required throughput and in congruent with larger strategic distribution plans. These are generally state responsibilities, with the POD responsibility resting with local jurisdictions. Coordination and compatibility of the plans are vital to ensure successful operations. Various options can be used to streamline their operations. These types of PODs are oriented toward a "pull" mechanism, a type of dispensing where the exposed and potentially exposed population comes to the POD to pick up medication.

On the other hand, a "push" mechanism refers to a type of dispensing where countermeasures are delivered to individuals at their residence or current location. As discussed by several speakers including Stephanie Dulin of CDC, several communities are implementing push mechanisms by using the U.S. Postal Service to deliver (dispense) a small supply of medical countermeasures to every residence within hours of an attack (Box 2). Postal carriers would deliver a package of medicine, such as a 10-day supply of antibiotics in the case of anthrax prophylaxis, to individual households (not businesses). This method would be part of a layered strategy to take pressure off of open PODs, while also buying significant time to dispense the remainder of the doses through any number of other dispensing mechanisms. This method can reach large numbers of people quickly, allow residents to shelter in place if there are environmental risks, and can be carried out by experts in home delivery (e.g., postal carriers). In fact, a pilot test of the U.S. Postal Service model has shown that approximately 55,000 housing units can be reached within nine hours from the start of deliveries by 48 postal carriers (Box 2). However, state and local health officials still have concerns regarding the feasibility of the U.S. Postal Service plan—for example with regard to the impact of personal protective equipment on postal carrier effectiveness and the feasibility of obtaining necessary security details.[5]

In the event of an anthrax attack, most communities plan to dispense enough antibiotics to a person or family to provide coverage for the first 10 days after an incident, thereby buying time for a second wave of dispensing. A quick-strike capability could be conducted through traditional pull mechanisms such as PODs, through push mechanisms such as the U.S. Postal Service (Box 2), or by allowing pre-positioning of a MedKit

[5]Text in the prepublication version was modified to reflect state and local concerns more accurately.

(a personal antibiotic cache which could contain a few days' supply of countermeasures) in individual homes. Dispensing of continued countermeasures would be accomplished through other sources (including pull mechanisms). In the case of anthrax, continued countermeasure dispensing would be needed to ensure that the remainder of the necessary 60-day course of prophylaxis was administered to the at-risk populations. One single innovation is unlikely to fit all communities. Multiple options, including PODs of many types, are needed to spur innovation at the community level, Baccam said.

In summary, a number of different dispensing modalities were discussed at the workshop (Box 3).

BOX 2
U.S. Postal Service Plan

Recognizing that points of dispensing may not be able to reach the entire at-risk population within 48 hours, a new federally sponsored program was designed to provide a "quick strike." Initiated in 2004, the program is conducted by the U.S. Postal Service (USPS) using postal carriers to dispense to residences a short-term supply of medical countermeasures. The program was developed and later pilot tested under the auspices of the Centers for Disease Control and Prevention's (CDC's) Cities Readiness Initiative.

The main features of the USPS program are:

- Outfitting postal carriers and other volunteers with personal protective equipment, including respirators, protective gloves, and disposable clothing;
- Providing USPS employee volunteers and their families appropriate counseling, training, and prophylaxis prior to onset of dispensing[a];
- Ensuring that postal carriers have security escorts;
- Initiating the program through tactical planning within the USPS and with federal, state, and local governments;
- Accomplishing direct delivery/dispensing of countermeasures within 12 hours of the decision to start the program; and
- Conducting drills that allow for real-world adjustments to improve efficiency and effectiveness.

Drills were conducted in 2006 and 2007 across two to three ZIP Codes in three cities: Seattle, Boston, and Philadelphia. Postal carriers dispensed mock antibiotics to approximately 22,000, 36,000, and 55,000 housing units in the three drills. In these operational drills, dispensing of medications took only 6-9 hours, although the postal carriers did not wear personal protective equipment. The success of these drills provided evidence that the system could work.

[a]This bullet was expanded after release of the prepublication version to reflect additional features of the program.

BOX 3
Potential Dispensing Modalities

Points of dispensing (PODs): The PODs concept was initially developed to address the smallpox threat and is the public health-preferred method of providing vaccine prophylaxis at designated dispensing locations for persons who are currently healthy, but may have been "exposed." The role of the PODs has been extended to dispense oral antibiotics.

Home delivery by the U.S. Postal Service (USPS) or other groups: Home delivery of antibiotics by the USPS was conceptualized as a way to increase the speed of dispensing self-administered medical countermeasures and to reduce the population surge at PODs. With this modality, mail carriers with security escorts deliver antibiotics directly to homes. Other novel dispensing methods may exist, such as utilizing newspaper delivery carriers.

Pre-deployment of community-based caches of medications: Pre-deployment of antibiotics to community-based caches might include houses of worship, schools, large employers, or fraternal organizations. This option may include the development of retail PODs (operated by retail businesses to provide medical countermeasures to their employees and the public) or closed PODs (operated by organizations to provide medical countermeasures to their employees and their family members).

Pre-positioning to first responders: Pre-event dispensing to first responders could mean that critical personnel and/or volunteers would be issued antibiotics after being identified and trained.

Pre-positioning of medications in households: Pre-event placement of caches of antibiotics or other medical countermeasures (MedKits) in households are to be reserved for use during a declared public health emergency. A pilot study was conducted in St. Louis to test the feasibility of MedKits in households. While some consider the study a success, further studies are needed to ensure safety and prevent misuse before implementing a wide scale MedKit program. The provision of MedKits is currently under discussion with the Food and Drug Administration.

Additional Challenges

Many challenges were discussed throughout the workshop. As will be summarized in greater detail below, David Henry of the National Governors Association, Scott Mugno of FedEx Express, and others highlighted the need to provide liability protection for those who dispense medications, and to ensure that skilled staff, whether medical or nonmedical, are staffing the PODs. Other significant challenges include recruiting and retaining enough personnel or volunteers to meet POD staffing requirements and coordinating across and within the private and public sectors, including law enforcement. Local planners encounter similar obstacles, said Christopher Hoff of Illinois' Kane County Health Department. He underscored the problem of fragmented, disorganized social support systems for vulnerable populations at the local level, not to mention at the state and federal levels. Fragmentation is compounded when serving local groups with special needs, including the elderly, individuals with mental illness, and children. Local staff service providers are already heavily tasked; they suffer from high turnover rates and reduced funding (whether from federal, state, tribal, or local coffers), all of which present obstacles to an organized system of countermeasure dispensing. Hoff envisioned pull mechanisms for able-bodied individuals and push mechanisms for special needs populations. In summary, the integration of federal, state, tribal, and local efforts to distribute and dispense medical countermeasures is essential.

The most difficult issues arise at the local level, according to many workshop participants. Summarizing the discussion, Lisa Koonin of CDC highlighted the major gaps and challenges to be considered (Box 4). The main challenge is that few communities have existing mechanisms to comprehensively dispense countermeasures. Helping them to develop new programs or adapt existing ones is integral to the success of the entire public health undertaking. As suggested by Eva Lee of the Georgia Institute of Technology, conducting preparedness exercises and publishing evaluation results could provide both a starting point and an incentive for improvement. The most important measure of success, expressed by several presenters, is in terms of lives saved. The next section of this workshop summary is devoted to near-term solutions to deal with the challenges in dispensing countermeasures.

BOX 4
Potential Gaps and Challenges in Current Methods of Dispensing Countermeasures

Workforce: Staffing requirements for points of dispensing (PODs) mandate a large number of personnel.

High-touch activity: Each person who receives medications from PODs must have several interactions with POD staff, which takes time.

Need for volunteer training: Volunteers would need training prior to an event, as well as guidance during an event.

Need for medical surveillance for volunteers: Assurance is needed that volunteers remain healthy during POD operations.

Security needs: Crowds must be controlled to maintain order around and within POD facilities.

Patient tracking/registries: Systems are needed to account for all persons served at PODs.

Rapid time frame: Optimally PODs would dispense countermeasures to a large population within 48 hours of the decision to initiate dispensing.

Lack of coordination among agencies in community: Often communication and coordination are lacking within various sectors of the community.

Lack of framework: A framework to engage private-sector templates and tools is not available to guide private-sector engagement.

Liability issues: Private-sector volunteers and entities would need protection against liability to participate in the care of others.

Leadership: In some jurisdictions bioterrorism preparedness is not a top priority and therefore no one is assigned to lead activities if an event occurs.

EMERGING FRAMEWORKS, TECHNOLOGIES, TOOLS, AND INNOVATIONS

Much of the workshop focused on a variety of near-term solutions to promote better, more streamlined means of dispensing countermeasures to affected populations. One panel sought to identify near-term solutions drawing from the adaptation of current public- and private-sector organizations and their planning efforts. Other panels identified novel dispensing methods through new types of public–private partnerships or through push and pull mechanisms. Considering the high degree of overlap across these topics, the rest of this summary focuses on the dominant themes of adapting existing frameworks to augment dispensing sites, increasing staffing for PODs, fostering new types of public–private partnerships, and ensuring liability protection for private-sector partners.

Adapting Existing Frameworks

Countermeasure dispensing is likely to be more successful if it capitalizes on and adapts processes that have already been successful in existing public- and private-sector networks, said panelist James Shortal, the director of business continuity at Cox Communications. One of the greatest logistical hurdles regarding countermeasure dispensing is its need for significant personnel resources regardless of whether staff are paid or volunteer. As previously discussed, the decision to utilize a medical or non-medical POD, as well as other layered strategies discussed below, could greatly impact that number of personnel required. One estimate highlighted during the workshop by Koonin, based on Baccam's presentation, suggested that the Washington, DC, metropolitan area might require 60,000 to 100,000 volunteers to staff PODs. Local public health departments serving these large jurisdictions are extremely unlikely to possess that degree of staffing. Several speakers suggested that because it is infeasible to ensure the availability of such a large number of volunteers, public–private collaboration is ideal. "Think outside the POD" was the exhortation of speaker Koonin, capturing the importance of nontraditional measures to recruit sufficient staff and other steps to dispense countermeasures on a large scale. It was also mentioned that a corporate or large "big-box" retail entity could assist by providing its workforce, physical facility, and logistical support. These entities could be counted on regardless of federal planning grants and have a

vested interest in preserving the community. The ability to integrate advance training and preparation in an identifiable group and entity was superior to just-in-time training of speculative volunteers.

Typical sites for large-scale community activities, such as stadiums and high schools, are other options for locating open PODs. To streamline logistics, Jeffrey Holmes, director of PRTM, spoke of adapting the U.S. Department of Defense's logistics model called SCOR,[6] which has been so successful that it is used outside the military, usually by private industry. These and other programs might be adapted to hasten the supply chain of medical countermeasures (through either push or pull mechanisms). Extra staffing for any of the functions performed at the POD could be obtained through partnerships with temporary staffing agencies, the panelist said. Another tactic involved the use of high-volume retailers.

Kevin Smith, national disaster services specialist for America's Second Harvest, spoke of seeking help from local nonprofit organizations by using the distribution networks they have developed to meet the needs of special populations, including homeless and homebound people and nursing home residents. He spoke of tapping into "Second Harvest," a network of more than 200 food banks throughout the United States. Second Harvest works with local agencies to serve, primarily through pull mechanisms, more than 50,000 pounds of food per month. The ability of nonprofit networks to dispense medical countermeasures critically depends on their current presence in any given community.

Using the nation's vast network of home newspaper delivery contractors is yet another possible approach that could be employed as part of a layered communication and dispensing strategy, suggested John Murray, vice president of circulation marketing for the Newspaper Association of America. Murray pointed out that 1,250 daily newspapers serve approximately 40.5 million homes, businesses, and schools. Many independent contractors who deliver newspapers occasionally deliver product samples, ranging from shampoo boxes to cereal. In a survey of newspaper distributors, Murray said, 71 percent indicated they already deliver product samples or have the capacity to deliver them. Furthermore, newspaper publishers view themselves as deeply embedded in the community and carry an obligation to serve the public. The lead time needed to affix medical countermeasures to their delivery routes would

[6]Supply Chain Operational Reference.

be about 36 to 48 hours, Murray suggested. However, if given notice, Murray said, that time could be shortened.

A key point emphasized by several panelists was that recruiting and retaining extra labor for the dispensing effort hinges on ensuring that the personnel and their families are among the first to receive countermeasures or that they are provided MedKits to store at home in advance. One panelist's experience showed that personnel are far more likely to show up in an emergency if they and their families are assured of being protected. Several events of national significance were cited illustrating this point, including the response to Hurricane Katrina.

This point reinforced the concept of a civil defense for the 21st century, which was highlighted by workshop co-chair Matthew Minson, senior medical advisor in the Office of the Assistant Secretary for Preparedness and Response, HHS. Minson mentioned that one consistent feature in the initial response to the hurricane was that a neighbor or citizen was immediately on hand to support other citizens before formal response organizations arrived. In addition, to further support personal preparedness states like Florida use state tax holidays to encourage purchasing of water and other necessities in advance of a hurricane. Given the imperatives of the CRI, Minson suggested this investment in the public is well advised.

Public–Private Partnerships

Forging novel partnerships between government agencies and the private sector is not just an option but a necessity, spurred by the magnitude of the U.S. population and the gravity of the threat, according to many speakers. Multiple types of public–private partnerships have already begun to flourish, and many more possibilities were raised at the workshop. The partnerships are wide ranging (Boxes 5 and 6), from negotiating complex logistical agreements to creating closed PODs. They typically provide advantages for each party. The structure of the partnerships is equally broad, covering open or closed PODs, and PODs using other push or pull mechanisms. This section highlights the diversity and flexibility of those partnerships, but begins with the fundamental principles underlying them. A summary of ideas that were presented by individuals during the meeting is also highlighted in Box 6.

One principle is that a singular approach to dispensing is unrealistic. The most realistic approach is a layered one that combines several types

of strategies, including short term and long term. One major example of a layered approach is the use of the U.S. Postal Service to provide the first several days' worth of countermeasures in certain areas, followed by other methods (e.g., PODs) to dispense the remainder of the doses needed. Another example is prior placement of MedKits for in-home use at the beginning of a public health emergency, after which countermeasures could be dispensed at PODs or alternative sites, noted speakers Gregory Burel and Linda Neff of CDC. This concept was encouraged by a number of workshop participants, who noted that regardless of the additional methodology, enabling pre-positioning of MedKits would relieve pressure from the public health system during the initial 48 hours. As a point of equity, an analogy was drawn to hurricane response and allowing individuals to use their own cars to evacuate so that public transportation could serve less advantaged members of society. The idea is that those with fiscal means could procure a MedKit for themselves and their families, which would allow public health and the public–private dispensing mechanisms to focus greater attention and effort on getting antimicrobial prophylaxis to those who were not able to acquire a MedKit.

BOX 5
Possible Activities Undertaken Through Public-Private Partnerships

- Coordinating logistics, warehousing, and distribution of countermeasures.
- Setting up open points of dispensing (PODs) for dispensing countermeasures.
- Setting up closed PODs, usually by large employers for their employees and their families, thereby decreasing the volume of people at open PODs.
- Providing temporary labor to staff PODs and perform many other functions.
- Training and screening of volunteers.
- Preregistering individuals to screen for adverse health effects.
- Tracking and registering people who receive countermeasures.
- Providing education and communication for recipients of countermeasures.
- Providing security for open or closed PODs.
- Conducting research and development for new medical countermeasures.
- Providing technical assistance to private organizations to help them establish PODs.

BOX 6
Ideas for Improving Current Planning Efforts

- Create innovative frameworks, models, and partnerships for the public and private sectors to meet the massive challenge of dispensing countermeasures to affected populations within 48 hours of the decision to do so.
- Streamline the design of points of dispensing (PODs) to vastly increase the number of people who receive countermeasures in the quickest possible time.
- Cultivate novel alternative POD designs, especially through public-private partnerships for numerous functions, including reduced pressure on public PODs.
- Harness technology systems to track and register people who receive medicines and their medicine lot numbers.
- Identify in advance those at risk for adverse effects from a given countermeasure.
- Ensure liability protection for private-sector partners to distribute and dispense countermeasures.
- Recruit a large workforce, train them, and ensure back-up to fill in if the regular workforce is inadequate or unavailable during an emergency.
- Perform actual planning exercises that permit and encourage improvised decision making.
- Identify the best methods of communication during a public health emergency as well as where and how to obtain medical countermeasures.
- Provide security at PODs and other dispensing sites.

The use of "pre-positioning," however, is controversial and it was suggested by a workshop participant that perhaps prior placement of countermeasures should be restricted to public health personnel and other first responders, as opposed to the general public. Pre-positioning for first responders could mean that critical personnel and/or volunteers would be issued antibiotics after being identified and trained.

Another possibility is that local pharmacists, through public–private partnerships, could help to screen individuals who may need assistance, clinical evaluation, access to pharmaceutical records, and knowledge of drug–drug interactions, said presenter Mike Simko of Walgreens, a pharmaceutical chain with 6,000 U.S. pharmacies. Moreover, pharmacists have the added advantage of being able to perform immunizations in many states. Immunizations may be critical in a public health emer-

gency and pharmacists may be able to offer their expertise to expand the workforce needed in an emergency. Similar points about the multiple clinical roles played by pharmacists were reiterated by Greg Sciarra of CVS Caremark.

Carter Mecher from the White House Homeland Security Council reinforced the idea that a combination of several partially effective actions, such as a layered strategy, would be needed to address the goal of rapidly dispensing countermeasures to a large population. Another principle is that the field is not starting from scratch. Many local governments, some described below, have already entered into partnerships with the private sector. Those partnerships are beginning to spring up in many localities and are tailored to meet precise local needs, according to speakers Teresa Bates of the Department of Public Health of Tarrant County, Texas, and Robert Mauskapf of the Virginia Department of Health. Bruce Baker, the SNS coordinator for the Maryland Department of Health and Mental Hygiene, described his experience working with a variety of private-sector partners including a major trucking company, Maryland public television, newspapers, and big-box retail stores. A final and interrelated principle is that no single approach will work for every community. Local governments say they are seeking a menu of options from which they can pick and choose to meet their specific needs, several speakers noted.

Any private establishment that can rapidly serve large numbers of customers represents a potential opportunity for a public–private partnership. Potential dispensing sites for open PODs could even include sites such as McDonald's, Starbucks, and Wal-Mart, noted several panelists. Other sites might include restaurants, special pharmaceutical vending machines, retail stores, pharmacies, grocery stores, banks, automatic teller machines, and any other venue with drive-through facilities, Koonin said. She noted that McDonald's serves thousands of customers a day at a single location. By entering into agreements with local governments, these organizations could be innovatively adapted to become predesignated as open PODs. Agreements typically require the private party to provide security, staffing, and recordkeeping (on recipients of the countermeasure and/or the number and nature of any adverse events), among other elements. Developing model agreements (Memorandum of Agreement) for use by state and local governments and HHS would explore Public Readiness and Emergency Preparedness (PREP) Act provisions for liability and emergency protection allowances.

Lynne Kidder of the Business Executives for National Security highlighted the importance of establishing public–private partnerships at the local level, where personal relationships are more easily established and later maintained during an event. Jason Jackson, the Director of Emergency Management for Wal-Mart Stores, Inc., echoed the sentiment that experience has shown that public and private partners are able to work together extremely well during a disaster to solve problems, particularly if the groundwork has been laid in advance to establish a trusting relationship. Jack Herrmann, Project Director of Public Health Preparedness at the National Association of County and City Health Officials (NACCHO), also noted that it is important for local public health departments to reach out to and stay in touch with their current and potential business partners; frequent communication and collaboration can help to reduce the language and cultural differences between the public and private sectors. The CDC may also develop a template Memorandum of Agreement (MOA) to assist local governments and organizations in their efforts to create public–private partnerships, suggested Dulin.

Closed PODs

Closed PODs, which are not open to the public and instead focus on one particular group (such as a company's employees and their families), may be an ideal means for large employers to partner with the public sector. The benefits to each partner are numerous. For the public partner, fewer people would need to be served at nearby open PODs. Pamela Blackwell, Director of the Center for Emergency Preparedness and Response for the Cobb and Douglas Boards of Health in Marietta, Georgia, estimated that the currently planned closed PODs in the metro Atlanta area might reduce the number of people who need access to open PODS in case of an event by 40 to 50 percent, allowing public health to focus on at-risk populations in places such as jails and nursing homes. There is even a multiplier effect, as the household members of the employee may also receive countermeasures at the closed POD. Panelist Shortal noted that, in the case of a 10,000-person corporate headquarters, the total served when their families are included might easily reach 50,000 people, or more. For the employer, a large benefit is that their employees feel more secure that they and their families are protected. Employee security may foster greater loyalty to the company, reduce turnover, and promote swifter return to commercial operations after the emergency,

thereby restoring the company's and possibly the local community's economic viability (Lindner, 2006). However, employer concerns regarding potential liability from dispensing medications would need to be addressed, emphasized Shortal, Mugno, Jackson, Kidder, and other participants from the private sector.

Other benefits of closed PODs were articulated by speaker Karen Drenkard, chief nurse executive of Inova Health Systems in Virginia. Her health system has already become a closed POD by entering into a partnership with the government. That designation enabled her to purchase a cache of medications large enough to cover Inova Health Systems' 17,000 employees. Ensuring coverage for hospital personnel (and their families) is imperative to ensure readiness of critical hospital staff and to minimize absenteeism from staff who may become ill or reluctant to come to work if they do not have countermeasures available to them early in the event.

Drenkard said Inova hospitals' closed PODs have a dispensing capacity of 1,200 people an hour. For staffing at the closed PODs, her organization brought in nonclinical volunteers and trained them in groups of 10 to 20. To recruit more volunteers, Drenkard began a program that taps into nursing, pharmacy, and social work students. She and her staff also developed an "incident command system" with a clear chain of command. As part of a preregistration process, Drenkard set up a layered approach to distribute in advance a 3-day supply of countermeasures to homes of staff and family. The rest of the doses would be dispensed around the time of the emergency. However, provisions and guidance for the dispensing of countermeasures from closed POD had not been completely formulated.

Closed PODs have already proved to be appealing to large employers in Tarrant County in Texas. Panelist Teresa Bates reported that since 2006, she has been partnering with several local businesses and universities to create closed PODs. Her department requires the private-sector partner to have at least 600 employees to participate. As part of the signed agreements between the employer and the health department, the employer is required to provide medical staff and armed security during the event. Her department trains the employers' POD staff as Medical Reserve Corps volunteers.

Preregistration and Prescreening of Individuals

For the broader problems of increasing efficiency and detecting adverse effects of countermeasures, regardless of whether PODs serve the public or private sector, Drenkard recommended a type of preregistration system akin to an E-ZPass,[7] which is used on many highways to facilitate traffic flow by collecting tolls through advance registration. By gathering medical information in advance—with confidentiality protected—an individual could receive medical countermeasures more quickly, and be flagged ahead of time as at risk of suffering a drug–drug interaction or serious adverse effects (and thus receive a possible alternative drug). Medical recordkeeping is important not only to identify adverse effects in individuals, but it is also is an essential means to track whether a particular batch of a given countermeasure is contaminated. By tracing epidemiological patterns of adverse effects, in other words, epidemiologists will be able to determine whether an adverse event is an isolated case or whether it is tied to a contaminated lot of the countermeasure, for which a recall might be necessary.

PODs of any configuration can use information technology to dispense countermeasures in an efficient and swift manner. One potential way to achieve that was suggested by speaker Noah Glass, chief executive officer of GoMobo, Inc., a company that uses innovative mobile technologies to allow consumers to preorder food from restaurants online or via text message. Based on his experience, he outlined a similar system that could rely on cell phones and text messages to help individuals avoid long lines at PODs. Within less than 2 years, a system could be developed to pre-register individuals and families, acquire pertinent medical information, and provide detailed educational materials. At the time of an emergency, a text message or automated call to the owner of the cell phone would be used to assign a location and time at which the head of household (or other household member) should arrive at the POD. Once there the individual would identify the last four digits of a cell phone number or other code in order to obtain a prepackaged set of countermeasures in the amount necessary for the size of his or her household. However, as suggested by a participant, questions remain

[7]E-ZPass is an electronic toll collection system used throughout the northeast United States that allows participants in the program to preregister accounts so that tolls may be deducted from prepayments made by the users. A small, removable sign attached to the middle of the upper windshield allows participants to pass through tolls without stopping, which ultimately improves the flow rates at toll booths.

about the availability of cell phones during an event, so research may need to be conducted to determine how such a system could be developed to ensure it were operational during an event.

Despite the promise of preregistration and prescreening as a way to increase the efficiency of medical countermeasures dispensing in the case of an event, many important questions remain regarding the feasibility of this approach, including how to address privacy concerns as well as the technical challenges of creating, maintaining, and updating such a system.

Staffing Requirements

Public–private partnerships can be used to ensure coverage of additional essential functions at PODs or alternative sites of delivery, the foremost being extra staffing, communication, health education, and security. If insufficient staff are available, private partners that specialize in these areas or temporary agencies may be able to assist by recruiting extra staff as needed. For example, one option that was highlighted by speakers was the possibility of using the knowledge and expertise of pharmacists to help screen and triage persons arriving at PODs. Another example of using existing resources, noted speaker Henry, is to harness a large range of public employees currently serving the public, such as first responders, firefighters, and other types of public employees, including the National Guard. In the Washington, DC, metropolitan area, many jurisdictions already mandate service by public employees in case of an emergency. In addition, individuals serving in the Medical Reserve Corps and Community Emergency Response Teams may also be called upon to assist in these efforts. To describe the opportunities offered by temporary agencies, the workshop heard from Jonathan Means, senior vice president and general manager of central operations and businesses for Kelly Services. Temporary employment agencies have the expertise and systems to recruit staff within a short period of time and have the capacity to set up call centers, for example, to assist in the dissemination of important information.

However, although public–private partnerships offer a mechanism to strengthen capacity, many questions raised were left unanswered. For example, it was suggested that the POD model may require more than double the current public health staffing to implement, but is this an accurate estimate? Another question that remains unanswered is how re-

peated and/or multiple attacks would be handled, and how many staff and resources would be needed to do so.

Security

In many communities, the availability of public-sector security personnel to provide services during countermeasures dispensing is a rate-limiting step. Potential partnerships with private security firms specifically devoted to maintaining public safety and security to provide additional security resources may be a feasible solution to the shortage of public-sector security personnel. Christopher Hetherington, a crisis manager at Citigroup, noted that there are 1.8 million trained private security officers in the United States. The distribution of these private officers is widespread because they are employed at banks and other establishments throughout the country. Just as the Office of Homeland Security already foresees that these officers are a component of their plan to respond to catastrophic events, it is reasonable to anticipate partnerships for protecting the public at PODs and any other alternative sites. Issues regarding recruiting, credentialing, and training of these security personnel would need to be resolved, as would the matter of liability and compensation.

Communication Systems

Finally, communication with the public is a vital function long before, as well as during, a public health emergency. In the case of anthrax exposure, pressure on public and private PODs will be alleviated if exposed individuals know where to go to get medical countermeasures and how to seek medical attention if they are ill. All public health departments, for example, have pre-scripted messages that are ready to be sent out during a public health emergency; yet a multi-layered communication strategy is necessary to reach the greatest number of people. Developing excellent communication systems is an important goal for public–private partnerships, given the multiple avenues through which people now receive their news and education. One speaker observed that the more the public knows, the less likely they are to panic. Speaker Mauskapf spoke of his experience with maintaining strong working partnerships with the media serving his state, Virginia, including the National Association of Broadcasters and local and national newspapers.

Mauskapf indicated that his organization is publishing information about and descriptions of anthrax in four languages. Speaker Neff also pointed out the challenge of communicating with and meeting the needs of non-English-speakers, and subsequently the necessity of developing appropriate communication strategies for non-English speakers. Other speakers pointed out the key role of the Internet for obtaining and updating information during a highly fluid crisis. Paul Freibert, a public health planner from the Kentucky Public Health Department, noted that one of his subcommittees routinely invites the television stations serving his state to be part of the planning process.

LIABILITY PROTECTION FOR CORPORATIONS AND NONPROFIT PARTNERS

During public health emergencies, both corporations and nonprofit organizations are concerned about the extent of their liability protection if they participate in countermeasures dispensing. Fear of liability has been a major deterrent to expansion of public–private partnerships, including research and development, according to Margaret Binzer, a partner at McKenna Long & Aldridge, LLP. She explained that under current federal and state laws, individual volunteers (e.g., "Good Samaritans") and government agencies (including their employees) have strong legal protections in dispensing during national emergencies, yet corporations and other entities lack immunity from liability in these circumstances. Recognition of the problem led to passage of new federal legislation, the Public Readiness and Emergency Preparedness Act of 2005 (Public Law 109-148), also known as the PREP Act.

At the time of passage, the PREP Act was hailed as a far-reaching piece of tort reform, giving liability protections to manufacturers willing to sell countermeasures during national emergencies. It protects manufacturers when selling pandemic products, security countermeasures, drugs, devices, and biological products. It also extends immunity to distributors and program planners, as well as to health care professionals who dispense medical countermeasures (Hoffman, 2008). The trigger for these liability protections is a declaration by the Health and Human Services Secretary that a public health emergency exists or is likely to exist. A Secretarial public health emergency declaration, if appropriately drafted, could provide additional liability protection to the private sector for assisting in the dispensing of medical countermeasures.

Although the PREP Act at the time of its passage seemed proactive to ensure coverage for future emergencies, it has only been used once. What was unforeseen was that the legal process to trigger a Secretarial declaration of a public health emergency has proved cumbersome and time consuming, Binzer said. Since passage of the Act, there has been only one declaration by the Secretary for sale and distribution of a vaccine against the avian flu H5N1, as well as supplements for H7 and H9 influenza vaccines. That so few declarations have been issued has been yet another signal to the private sector to remain deeply concerned about liability exposure, said Binzer and several other participants. A panelist mentioned that a large-scale anthrax attack would undoubtedly trigger a PREP declaration as well as a Presidential Disaster Declaration.

Another significant problem exists at the state level; few state statutes furnish immunity from liability to corporations and other entities when they act as Good Samaritans. In other words, private-sector entities such as hospitals, hotels, retail outlets, stadiums, and other organizations that donate time, space, supplies, and resources to emergency preparedness rarely enjoy liability protection (Hoffman, 2008). Iowa became the first state to extend its statutory Good Samaritan liability protection to corporations and nonprofit entities acting in good faith to provide emergency aid during a public health disaster. Georgia also recently passed similar innovative legislation—the Georgia Corporate Good Samaritan Act of 2008—to extend Good Samaritan protections to other entities besides individuals. Its basic features, which are described in Box 7, could serve as a model for other states. Liability protections are necessary to enlist support of the private sector in public–private partnerships, such as dispensing countermeasures to their employees ("closed PODs"). Similar efforts are under way in other states to explore ways to work within existing state laws to ensure that emergency volunteers and entities have broader immunity from liability during emergency response activities or to establish formal Good Samaritan entity liability protection for businesses.

BOX 7
The Georgia Corporate Good Samaritan Act of 2008

The Georgia Corporate Good Samaritan Act of 2008 provides that:

- Any natural person, association, organization, or private entity (directors, employees, and agents of such organization);
- Working in coordination with and under the direction of an appropriate state agency;
- Who voluntarily without the expectation or receipt of compensation;
- Provides services or goods to another to prevent or minimize harm resulting from an emergency or disaster for which an emergency is declared by the Governor or federal agency;
- Shall not be civilly liable to any natural person receiving such assistance as a result of a good faith act or omission unless the damage was caused by willful wanton negligence or misconduct of such natural person, association, organization, or entity.

SOURCE: Public/Private Legal Preparedness Initiative (2008).

CONCLUSION

In concluding the workshop, Parker's presentation summarized many of the comments made throughout the workshop, that planning and providing for countermeasures dispensing is not just the concern of government, but is a shared public–private responsibility to protect lives in a community. A new civil defense for the 21st century is needed, characterized by a set of shared responsibilities among all levels of government, individuals, and communities. Public health cannot do this job alone—collaboration from the private sector will be necessary to rapidly provide life-saving countermeasures to large numbers of people in a community. Combining multiple strategies to create a layered approach may afford the most resilient and effective system to accomplish this goal.

Parker noted that the United States is just about to reach the goal of having stockpiled sufficient antibiotics to provide post-exposure prophylaxis for 60 million people for 60 days in the event of an anthrax attack. However, Parker continued, if we do not have the mechanisms to get these lifesaving medicines in the hands of Americans after such an attack or multiple attacks within a very short timeframe, we have squandered an opportunity to save lives. Parker noted that an analogy can be found in

the school buses that ended up underwater in New Orleans after Hurricane Katrina. Those school buses, if harnessed early, could have been used to evacuate thousands of New Orleans citizens out of harm's way. Instead, this valuable resource was rendered useless. We must ensure that the same does not happen to the resources in our stockpile, said Parker.

When a strategist considers the potential threats against this nation in the arena of terrorism, two scenarios stand out as "strategic" in their impact: the first is a nuclear attack and the second is a bioterrorist anthrax attack on a large metropolitan area, noted Parker. The effects on this society in terms of loss of life and productivity of life, economic and psychological impact, and sustainability of a way of life would be unparalleled and unprecedented in American history. The efforts of federal, state, and local government have been considerable in preparing for the response to a widespread anthrax incident. It has been the focus of countless hours and untold industry, yet as evidence by the presentations made during the workshop there are a number of efforts underway to improve a communities efforts. However, the nation is not comprehensively prepared to mount the greatest possible defense. One other fact has emerged from the attempt to address this great charge, continued Parker. In a country where the government is a concept of, by, and for the people, its defense, resiliency, and best chance at sustainability depends on the willingness and ability of the people to work with government through a "shared responsibility," and it is imperative that the need for shared responsibility be understood.

Parker said that throughout the workshop he and other speakers, including Minson, Shortal, and Robert Holman from Dallas County Health and Human Services, had discussed this new concept of "Civil Defense for the 21st Century," and suggested the need for partnership between the government and the other key stakeholders—including corporate entities, nonprofits, other organizations, and individuals—is strongly seen in countermeasures response. If we are to save the greatest number of lives, then we must act to ensure that a complementary array of response capabilities are robust, vigorous, and ready, concluded Parker. The work of the IOM Forum, its members, and the workshop panel has been to move forward that principle.

A

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B

Workshop Agenda

Day 1
Monday, March 3, 2008
The Barbara Jordan Conference Center
Kaiser Family Foundation
1330 G Street, NW
Washington, DC

Workshop Objectives

- Identify and discuss the most promising near-term opportunities for improving the efficiency and effectiveness of frameworks designed for medical countermeasure dispensing.
    - What specific challenges arise in the dispensing of antibiotics?
- Discuss what innovations, tools, technologies, and frameworks are available from sectors outside the traditional public health system.
    - What existent resources and infrastructure in medical countermeasure dispensing should be maintained, improved, or serve as a foundation on which to build?
    - What existent resources and infrastructure have potential for application or adaptation to a disaster incident? What action steps are required to integrate these strategies into the current public health system?
    - What resources and further infrastructure investments will be necessary in the short and long terms?

  - How might innovative antibiotic countermeasure dispensing strategies be leveraged and expanded on to improve models for antiviral and vaccine dispensing?
- Explore potential partnerships that are needed to support and conduct improvements of dispensing medical countermeasures.
  - What are the current opportunities and barriers to creating stronger partnerships and how can these issues be addressed?

8:00 am Welcome and Introductions

LYNNE KIDDER, *Workshop Co-Chair*
Senior Vice President
Business Force
Business Executives for National Security

MATTHEW MINSON, *Workshop Co-Chair*
Senior Medical Advisor
Office of Policy, Strategic Planning, and Communications
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

OPENING REMARKS: PRINCIPAL DEPUTY TO THE ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE

8:15 am Medical Countermeasure Dispensing: Goals, Progress, and Challenges

GERALD PARKER
Principal Deputy Assistant Secretary
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

SESSION I: OVERVIEW AND CURRENT PLAN FOR DISPENSING MEDICAL COUNTERMEASURES

Session Objective: Provide an overview of the current threats, progress made, and remaining vulnerabilities in the public health system as they pertain to the dispensing of medical countermeasures, in particular antibiotics. Special attention will be made to the identification of associated gaps in dispensing medical countermeasures in the most effective and efficient manner, including the needs of special populations.

8:35 am Session Overview and Objectives

RICHARD BESSER, *Session Chair*
Director
Coordinating Office for Terrorism Preparedness and Emergency Response
Centers for Disease Control and Prevention

8:40 am Overview of the Current Threat

PRASITH (SID) BACCAM
Senior Scientist
Innovative Emergency Management

8:55 am Overview of Cities Readiness Initiative: Current Dispensing Framework and Gaps

GREGORY BUREL
Director
Strategic National Stockpile
Coordinating Office for Terrorism Preparedness and Emergency Response
Centers for Disease Control and Prevention

9:10 am Modeling Integrated Public Health and Health Care Delivery System Response to Anthrax

NATHANIEL HUPERT
Assistant Professor of Clinical Public Health
Assistant Professor of Clinical Medicine
Weill Medical College of Cornell University

9:25 am Overview of Challenges Experienced by State Officials

DAVID HENRY
Policy Analyst
Homeland Security and Technology
Center for Best Practices
National Governors Association

9:40 am Overview of Challenges Experienced by the Local Officials: Special Population Needs

CHRISTOPHER HOFF
Emergency Response Coordinator
Kane County, IL, Health Department

9:55 am Creative Solutions Using Existing Tools

MICHAEL SCHRAGE
Fellow, Center for Digital Business/Sloan School
Senior Advisor, Security Studies Program
Massachusetts Institute of Technology

10:15 am Discussion

RICHARD BESSER, *Session Chair*
Director
Coordinating Office for Terrorism Preparedness and Emergency Response
Centers for Disease Control and Prevention

10:30 am BREAK

SESSION II: INTEGRATING STRATEGIES: FRAMEWORKS, TECHNOLOGIES, TOOLS, AND INNOVATIONS

Session Objective: Review the innovations, tools, technologies, and frameworks (e.g., inventorying control and tracking, and registries) that are being used by sectors not traditionally included in the public health system. Discuss what action steps are required to integrate these strategies into the current public health system. Examine potential solutions to address:

1. Generate potential strategies to address improvement in current methods of dispensing countermeasures;
2. Explore feasibility of "outsourcing" the dispensing operation to a private-sector entity; and
3. Identify current business capabilities/solutions to develop novel dispensing methods.

10:45 am Session Overview and Objectives

LISA KOONIN, *Session Chair*
Senior Advisor
Influenza Coordination Unit
Centers for Disease Control and Prevention

10:50 am Panel Discussion #1: What current systems and strategies could be adapted to improve the currently planned dispensing methods for countermeasures?

JEFFREY HOLMES, *Panel Leader*
Director
Global Public Sector Practice
PRTM

DAN GUINN
Founder
Director of Compliance
Dispensing Solutions, Inc.

KEVIN SMITH
National Disaster Services Specialist
America's Second Harvest
The Nation's Food Bank Network

KAREN DRENKARD
Chief Nurse Executive
Senior Vice President
Inova Nursing
Inova Health System

MICHAEL KODY
Vice President
Supply Chain Solutions
AmerisourceBergen

11:45 am WORKING LUNCH

- Review opportunity and challenges identified during the morning sessions.
- Participate in informal discussions regarding mechanisms to integrate new strategies into current frameworks.

12:30 pm Panel Discussion #2: What novel dispensing methods could be developed harnessing current business capabilities?

JAMES SHORTAL, *Panel Leader*
Director
Business Continuity
Cox Communications, Inc.

JOHN MURRAY
Vice President
Circulation Marketing
Newspaper Association of America

CHRISTOPHER HETHERINGTON
Corporate Crisis Management Officer
Office of Business Continuity
Citigroup, Inc.

NOAH GLASS
Chief Executive Officer
GoMobo, Inc.

NATHANIEL HUPERT
Assistant Professor of Clinical Public Health
Assistant Professor of Clinical Medicine
Weill Medical College of Cornell University

BRUCE BAKER
Strategic National Stockpile Coordinator
Maryland Department of Health and Mental Hygiene

1:30 pm Panel Discussion #3: Explore feasibility of "outsourcing" the dispensing operation to a private- sector entity.

DONNA GARREN, *Panel Leader*
Vice President
Health and Safety Regulatory Affairs
National Restaurant Association

JASON JACKSON (via telecom)
Director of Emergency Management
Wal-Mart Stores, Inc.

MICHAEL SCHRAGE
Fellow, Center for Digital Business/Sloan School
Senior Advisor, Security Studies Program
Massachusetts Institute of Technology

EVA LEE
Associate Professor, H. Milton Stewart School of Industrial and Systems Engineering
Director, Center for Operations Research in Medicine and HealthCare
Georgia Institute of Technology

MARY STEINER
Preparedness and Response Nurse Coordinator
Oklahoma City–County Health Department

2:30 pm General Discussion

LISA KOONIN, *Session Chair*
Senior Advisor
Influenza Coordination Unit
Centers for Disease Control and Prevention

2:45 pm BREAK

SESSION III: DISPENSING CONSIDERATIONS: PUSH MECHANISMS AND PULL MECHANISMS

Session Objective: Discuss benefits, challenges, and strategies presented by dispensing countermeasures through either push or pull mechanisms.

3:00 pm Session Objectives

STEPHANIE DULIN, *Session Chair*
Chief of the Program Preparedness Branch
Division of Strategic National Stockpile
Coordinating Office for Terrorism Preparedness and Emergency Response
Centers for Disease Control and Prevention

3:05 pm Panel Discussion

LINDA NEFF
Senior Science Advisor
Division of Strategic National Stockpile
Coordinating Office for Terrorism Preparedness and Emergency Response
Centers for Disease Control and Prevention

MARK KEELER
State Coordinator
Strategic National Stockpile Program
Ohio Department of Health

ROBERT HOLMAN, III
Senior Planner
Dallas County Health and Human Services

GREG SCIARRA
Director
Pharmacy Operations
CVS Pharmacy

MICHAEL ROBBINS
Pharmacist
Medical Countermeasures
Public Health Preparedness and Response
Chicago Department of Public Health

3:30 pm Discussion

STEPHANIE DULIN, *Session Chair*
Chief of the Program Preparedness Branch
Division of Strategic National Stockpile
Coordinating Office for Terrorism Preparedness and Emergency Response
Centers for Disease Control and Prevention

SESSION IV: OPPORTUNITIES AND BARRIERS TO PARTNERING WITH THE PRIVATE SECTOR

Session Objective: Explore potential models to improve partnerships between the private sector and federal, territorial, state, and local jurisdictions. Discuss the current opportunities and barriers to facilitating improved partnerships and how barriers may be overcome.

4:00 pm Session Objectives

SCOTT MUGNO, *Session Chair*
Managing Director
Corporate Safety Health and Fire Protection
FedEx Express

4:05 pm Panel Discussion

ANTHONY BEGANDO
Chief Executive Officer
Tenon Consulting, Inc.

MIKE SIMKO
Corporate Manager
Pharmacy Health Information Technology
Walgreens Co.

ROBERT MAUSKAPF
Director
Emergency Operations, Planning and Logistics
Virginia Department of Health

TERESA BATES
Strategic National Stockpile Coordinator
Department of Public Health
Tarrant County, TX

PAUL FREIBERT
Public Health Planner
Office of Emergency & Public Health Preparedness
Louisville Metro Health Department

4:25 pm Discussion

SCOTT MUGNO, *Session Chair*
Managing Director
Corporate Safety Health and Fire Protection
FedEx Express

SESSION V: GENERAL DISCUSSION WITH WORKSHOP PARTICIPANTS AND ATTENDEES

Session Objective: Discuss what opportunities and constraints exist to implementing the frameworks and models discussed during day 1 of the workshop. What resources are required to implement the changes necessary to ensure that the most efficient and effective frameworks are in place for medical countermeasure dispensing? What new ideas have surfaced in this meeting today that should be explored further?

5:00 pm General Discussion with Workshop Participants and Guests

LYNNE KIDDER, *Workshop Co-Chair*
Senior Vice President, Business Force
Business Executives for National Security

MATTHEW MINSON, *Workshop Co-Chair*
Senior Medical Advisor
Office of Policy, Strategic Planning, and Communications
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

5:30 pm ADJOURN

Day 2
Tuesday, March 4, 2008
The Barbara Jordan Conference Center
Kaiser Family Foundation
1330 G Street, NW
Washington, DC

8:30 am Day 1 Review and Day 2 Objectives

LYNNE KIDDER, *Workshop Co-Chair*
Senior Vice President, Business Force
Business Executives for National Security

MATTHEW MINSON, *Workshop Co-Chair*
Senior Medical Advisor
Office of Policy, Strategic Planning, and Communications
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

SESSION VI: WORKFORCE REQUIREMENTS

Session Objective: Discuss the current workforce constraints on the existing public health system, how human resources from other sectors can be leveraged to ensure adequate capacity to dispense medical countermeasures in response to a catastrophic health event, and what measures, including personal protective equipment, are required to ensure the health safety of the workforce. Identify and discuss technologies or system designs that may be used to minimize workforce requirements, while ensuring workforce safety.

8:40 am Session Objectives

JAYNE LUX, *Session Chair*
Director
Global Health Benefits Institute
National Business Group on Health

8:45 am Panel Discussion

JONATHAN MEANS
Senior Vice President
General Manager
Central Operations and Businesses
Kelly Services, Inc.

WESLEY MCDERMOTT
Public Health Emergency Preparedness Coordinator
Fairfax, VA, Department of Health

DAVID BROWN
Director
Global Employee Relations Strategy
The Coca-Cola Company

PAMELA BLACKWELL
Director
Center for Emergency Preparedness and Response
Cobb & Douglas Public Health

9:05 am Discussion

JAYNE LUX, *Session Chair*
Director
Global Health Benefits Institute
National Business Group on Health

SESSION VII: LIABILITY CONSTRAINTS, CONCERNS, AND UNKNOWNS

Session Objective: Explore how liability constraints, concerns, and unknowns may limit the partnerships with the private sector in the dispensing of medical countermeasures. What liability and antitrust protections do existing state and federal laws already provide, and what changes may be necessary?

9:40 am Session Objectives

ERIN MULLEN, *Session Chair*
Assistant Vice President
Rx Response
Pharmaceutical Research and Manufacturers of America

9:45 am Review of the Public Readiness and Emergency Preparedness Act (PREP Act)

MARGARET BINZER
Partner
Government Affairs
McKenna Long & Aldridge, LLP

10:00 am Panel Discussion

SCOTT MUGNO
Managing Director
Corporate Safety Health and Fire Protection
FedEx Express

GUY FARMER
Partner
Labor and Employment Group
Holland and Knight, LLP

SHARONA HOFFMAN
Professor of Law and Bioethics
Co-Director
Law-Medicine Center
Senior Associate Dean for Academic Affairs
Case Western Reserve University, School of Law

10:20 am Discussion

ERIN MULLEN, *Session Chair*
Assistant Vice President
Rx Response
Pharmaceutical Research and Manufacturers of America

SESSION VIII: SECURITY CHALLENGES AND OPPORTUNITIES

Session Objective: Review current security plans and examine the resources available, as well as those that are needed, to ensure appropriate safety and security of assets and individuals during the dispensing of medical countermeasures.

10:50 am Session Objectives

KENNETH KUNCHICK, *Session Chair*
Senior Inspector
U.S. Marshals Service

10:55 am Panel Discussion

HARVEY RUBIN
Director, Institute for Strategic Threat Analysis and Response
Professor of Medicine, Microbiology, and Computer Science
University of Pennsylvania

BOYD STEPHENSON
Manager
Security and Cross-Border Operations
American Trucking Association

JERRY ELLSWORTH
Public Health Security Coordinator
Michigan Office of Public Health Preparedness

LARRY SABBATH
Executive Director
National Armored Car Association

11:20 am Discussion

KENNETH KUNCHICK, *Session Chair*
Senior Inspector
U.S. Marshals Service

SESSION IX: FUTURE DIRECTIONS AND RESOURCE CONSTRAINTS: DISCUSSION WITH WORKSHOP PARTICIPANTS AND ATTENDEES

Session Objective: Discuss what opportunities and constraints exist to implementing the frameworks and models discussed throughout the workshop. What resources are required to implement the changes necessary to ensure that the most efficient and effective frameworks are in place for medical countermeasure dispensing? What new ideas have surfaced in this meeting that should be explored further? Who is not at the table now and needs to be included in further discussions? How can we capture the innovation and ideas discussed during the meeting to rapidly proceed with developing next steps?

11:50 am Panel Discussion: Overview of Opportunities, Priorities, and Resource Requirements Identified During the Workshop

JAMES BLUMENSTOCK
Chief Program Officer
Public Health Practice
Association of State and Territorial Health Officials

LYNN GOLDMAN
Chair, Interdepartmental Program in Applied Public Health
Johns Hopkins Bloomberg School of Public Health

JACK HERRMANN
Senior Advisor
Public Health Preparedness
National Association of County and City Health Officials

LYNNE KIDDER, *Workshop Co-Chair*
Senior Vice President, Business Force
Business Executives for National Security

CARTER MECHER
Director
Medical Preparedness Policy
White House Homeland Security Council

MATTHEW MINSON, *Workshop Co-Chair*
Senior Medical Advisor
Office of Policy, Strategic Planning, and Communications
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

12:15 pm Discussion With Attendees

LYNNE KIDDER, *Workshop Co-Chair*
Senior Vice President, Business Force
Business Executives for National Security

MATTHEW MINSON, *Workshop Co-Chair*
Senior Medical Advisor
Office of Policy, Strategic Planning, and Communications
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

12:45 pm Closing Remarks

GERALD PARKER
Principal Deputy Assistant Secretary
Office of the Assistant Secretary for Preparedness and Response
Department of Health and Human Services

1:00 pm ADJOURN

C

Registered Workshop Attendees

David Abramson
Columbia University National Center for Disaster Preparedness

Terry Adirim
Office of Health Affairs, Department of Homeland Security

Issac Ajit
Maryland Department of Health and Mental Hygiene

George Alexander
U.S. Department of Health and Human Services

Jennifer B. Alton
U.S. Senate Committee on Health, Education, Labor, & Pensions

Wilmer Alvarez
Columbia University National Center for Disaster Preparedness

Tali Bar-Shalom
Office of Management and Budget

Ann Beauchesne
U.S. Chamber of Commerce

Joseph Becker
American Red Cross

Barron Bell

Georges Benjamin
American Public Health Association

Kavita Berger
American Association for the Advancement of Science

Richard Besser
Centers for Disease Control and Prevention

Douglas Boenning
U.S. Department of Health and Human Services

Kathryn Brinsfield
American College of Emergency Physicians

Dennis Brown
U.S. Department of Health and Human Services

Paula Burgess
Centers for Disease Control and Prevention

Pat Bye
Synthosys

Michelle Cantu
Center for Biosecurity of University of Pittsburgh Medical Center

Spencer Cason
Essex Innovation Group

Diane Caves
Centers for Disease Control and Prevention

Norm Coleman
U.S. Department of Health and Human Services

Brooke Courtney
U.S. Department of Health and Human Services

Stephen Cunnion
Potomac Institute for National Security Health Policy Center

Robert Darling
Uniformed Services University of the Health Sciences, U.S. Public Health Service

Kristin Dawson

Lawrence Deyton
Department of Veterans Affairs

Donald A. Donahue, Jr.
Potomac Institute for National Security Health Policy Center

Joe Donovan
Beacon Capital Partners, Inc.

Jeffrey Duchin
Seattle & King County and University of Washington

Stephanie Dulin
Strategic National Stockpile, Centers for Disease Control and Prevention

Jaime Durley
U.S. Department of Health and Human Services

Peter Emanuel
Office of Science Technology Policy, Executive Office of the President

Aaron M. Firoved
Senate Homeland Security & Government Affairs Committee

Brian W. Flynn
Uniformed Services University of the Health Sciences, U.S. Public Health Service

Perry Fri
Healthcare Distribution Management Association

Andrew Garrett
Columbia University National Center for Disaster Preparedness

Asha M. George
U.S. House of Representatives (Majority Staff)

Luke George
National Safety Council

Lynn Goldman
Johns Hopkins University School of Public Health

Craig Haimson
The MITRE Corporation

Julie Hantman
Infectious Diseases Society of America

Richard J. Hatchett
National Institute of Allergy and Infectious Diseases, U.S. Department of Health and Human Services

Jerome M. Hauer
Former Assistant Secretary, U.S. Department of Health and Human Services
The Hauer Group

Robert Hayhurst
Office of the Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services

Pamela Henderson
U.S. Department of Health and Human Services

Jeffrey Holmes
PRTM

Chad M. Hrdina
U.S. Department of Health and Human Services

Bob Irwin
Centers for Disease Control and Prevention

Alex Isakov
Emory University

Jason F. Jackson
Wal-Mart Stores, Inc.

James James
American Medical Association

Paul Jarris
Association of State and Territorial Health Officials

Harvey Johnson, Jr.
Federal Emergency Management Agency

Jerry Johnston
National Association of Emergency Medical Technicians

Robert Kadlec
White House Homeland Security Council

Joseph M. Kaminski
National Institutes of Health

Lisa Kaplowitz
Virginia Department of Health

Lynne Kidder
Business Executives for National Security

James Kirkwood
New York State Department of Health

Donna Knutson
Centers for Disease Control and Prevention

Lisa Koonin
Centers for Disease Control and Prevention

Jon Krohmer
Office of Health Affairs, Department of Homeland Security

Michael Kurilla
National Institute of Allergy and Infectious Diseases, U.S. Department of Health and Human Services

Laura Kwinn
U.S. Senate Committee on Health, Education, Labor, & Pensions

Daniel Lamb
Philips Healthcare

Lara Lamprecht
U.S. Department of Health and Human Services

Jessica Lang
Terrorism Research Center

William Lang
American Association of Colleges of Pharmacy

James Lawler
White House Homeland Security Council

Matthew Lawrence
United Parcel Service of America

Patrick Libbey
National Association of County and City Health Officials

Jodi B. Lieberman
U.S. Senate Homeland Security Committee, Oversight of Government Management Subcommitte

Jayne Lux
National Business Group on Health

Christopher Magee
Centers for Disease Control and Prevention

Monique K. Mansoura
U.S. Department of Health and Human Services

Ronald Maples
U.S. Department of Health and Human Services

David Marcozzi
U.S. Department of Health and Human Services

Maria Marinissen
U.S. Department of Health and Human Services

Wesley McDermott
Virginia Department of Health

Margaret McMahon
Emergency Nurses Association

Carter Mecher
White House Homeland Security Council

Toby Merlin
Centers for Disease Control and Prevention

Matthew Minson
Office of the Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services

Judith Monroe
Association of State and Territorial Health Officials

Denise Mooney
The MITRE Corporation

Scott Mugno
FedEx Express, Inc.

Erin Mullen
Rx Response for the Pharmaceutical Researchers and Manufacturers of America

Robert Nadolski
Emory University/Emory Healthcare

Thomas Neal
The MITRE Corporation

Chris Nelson
RAND Corporation

Lucienne Nelson
U.S. Northern Command

Amy Nevel
U.S. Department of Health and Human Services

Rita E. Norton
AmerisourceBergen Corporation

Jennifer Nuzzo
Center for Biosecurity of University of Pittsburgh Medical Center

Bill O'Connell
National Safety Council

Ann E. O'Connor
Centers for Disease Control and Prevention

Tara O'Toole
Center for Biosecurity of University of Pittsburgh Medical Center

Gerald Parker
Office of the Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services

Cheryl Peterson
American Nurses Association

Steven Phillips
National Library of Medicine

Vanessa Procter
MedImmune, Inc.

Irwin Redlener
Columbia University School of Public Health

Bob Rehm
America's Health Insurance Plans

Luke Ridenhour
Essex Innovation Group, Inc.

Jeffrey Runge
Office of the Chief Medical Officer, Department of Homeland Security

Julie Schafer
U.S. Department of Health and Human Services

Phillip Schneider
National Association of Chain Drug Stores

Roslyne Schulman
American Hospital Association

Susan Sherman
U.S. Department of Health and Human Services

Tom Shipley
U.S. Department of Health and Human Services

James Shortal
Cox Communications, Inc.

Tiffany Smith
U.S. Department of Health and Human Services

John Solomon
New York Public Radio/National Public Radio

Julia Spencer
U.S. Department of Health and Human Services

Boyd Stephenson
American Trucking Association

Linda Stierle
American Nurses Association

Dan Stoneking
Ogilvy Public Relations

Michael Stoto
Georgetown University

Barbara Styrt
U.S. Food and Drug Administration

Michael Swigart
U.S. Postal Service

Robert J. Taylor
SAGE Analytica, LLC

Geoff Tison
Johns Hopkins University School of Medicine

Mark Torbeck
Department of Homeland Security

Marci Van Dyke
U.S. Agency for International Development

Margaret VanAmringe
The Joint Commission

Katherine Wallace
Department of Veterans Affairs

Jacob Ward
Office of Science and Technology Policy, Executive Office of the President

Dorothy Wawrose
U.S. Food and Drug Administration

Ken White
Philips Healthcare

Theresa Wiegmann
AABB (formerly known as the American Association of Blood Banks)

Diane Wray-Cahen
U.S. Department of Health and Human Services

Wayne Young
U.S. Department of Health and Human Services

Linda Yu
Synthosys

Mina Zadeh
U.S. Department of Health and Human Services

D

Organizations Represented

FEDERAL GOVERNMENT

Committee on Health, Education, Labor, & Pensions, U.S. Senate

Coordinating Office for Terrorism Preparedness and Emergency Response (COTPER), Centers for Disease Control and Prevention (CDC)

Department of Homeland Security (DHS): Office of Health Affairs

Department of Veterans Affairs

DHS: Federal Emergency Management Agency

Force Health Protection & Readiness: Department of Defense (DoD)

Homeland Security and Governmental Affairs, U.S. Senate

Homeland Security Committee, U.S. House of Representatives

National Institutes of Health (NIH): National Library of Medicine

NIH: National Institute of Allergy and Infectious Diseases

Office of Management and Budget, Executive Office of the President (EOP)

Office of Science and Technology Policy, EOP

Office of the Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services

Strategic National Stockpile, CDC: COTPER

Uniformed Services University of the Health Sciences, U.S. Public Health Service, DoD

U.S. Agency for International Development

U.S. Food and Drug Administration

U.S. Marshals Service

U.S. Northern Command, DoD

U.S. Postal Service

White House Homeland Security Council, EOP

STATE AND LOCAL GOVERNMENT

Association of State and Territorial Health Officials

Chicago Department of Public Health, IL

Cobb & Douglas Public Health, GA

Dallas County Health and Human Services, TX

Fairfax County Department of Health, VA

Kane County Health Department, IL

Louisville Metro Health Department, KY

Maryland Department of Health and Mental Hygiene

Michigan Office of Public Health Preparedness

National Association of County and City Health Officials

National Governors Association

New York State Department of Health

Ohio Department of Public Health

Oklahoma City–County Health Department

Seattle & King County, WA

Tarrant County Public Health, TX

Virginia Department of Health

PRIVATE SECTOR

AmerisourceBergen Corporation

Beacon Capital Partners, Inc.

Citigroup, Inc.

The Coca-Cola Company

Cox Communications, Inc.

CVS Pharmacy

Dispensing Solutions, Inc.

Essex Innovation Group, Inc.

FedEx Express, Inc.

GoMobo, Inc.

The Hauer Group

Holland and Knight, LLP

Innovative Emergency Management

Kelly Services, Inc.

McKenna Long & Aldridge, LLP

MedImmune, Inc.

The MITRE Corporation

Ogilvy Public Relations

Pharmaceutical Researchers and Manufacturers of America

Philips Healthcare

PRTM

Rx Response

SAGE Analytica, LLC

Synthosys

Tenon Consulting, Inc.

United Parcel Service of America

U.S. Chamber of Commerce

Walgreens Co.

Wal-Mart Stores, Inc.

ACADEMIA AND THINK TANKS

Case Western Reserve University, School of Law

Columbia University Mailman School of Public Health, National Center for Disaster Preparedness

Cornell University, Weill Medical College

Emory University/Emory Healthcare

Georgetown University

Johns Hopkins University, Bloomberg School of Public Health

Johns Hopkins University, School of Medicine

Massachusettes Institute of Technology

Potomac Institute for National Security Health Policy Center

RAND Corporation

Terrorism Research Center

University of Pennsylvania

University of Pittsburgh Medical Center, Center for Biosecurity

University of Washington

NONPROFIT ORGANIZATIONS

American Red Cross

America's Second Harvest – The Nation's Food Bank Network

Inova Health System

The Joint Commission

National Safety Council

New York Public Radio/National Public Radio

PROFESSIONAL ASSOCIATIONS

AABB (formerly known as the American Association of Blood Banks)

American Association for the Advancement of Science

American Association of Colleges of Pharmacy

American College of Emergency Physicians

American Hospital Association

American Medical Association

American Nurses Association

American Public Health Association

American Trucking Association

America's Health Insurance Plans

Business Executives for National Security

Emergency Nurses Association

Healthcare Distribution Management Association

Infectious Diseases Society of America

National Armored Car Association

National Association of Chain Drug Stores

National Association of Emergency Medical Technicians

National Business Group on Health

National Restaurant Association

Newspaper Association of America

E

Biographical Sketches of Invited Speakers, Panelists, Workshop Planning Committee, Forum Members, and Staff

INVITED SPEAKERS AND PANELISTS

Lynne Kidder, M.A. (*Workshop Co-Chair*), is the senior vice president of Business Executives for National Security (BENS). She oversees nation-wide implementation and operations of BENS' Regional Partnership programs, including the facilitation of resilience-focused public–private partnerships, and the development of programs, policies and recommendations for enabling public-private collaboration at all levels of government. In addition to providing management support to BENS-affiliated partnerships in New Jersey, Georgia, Kansas City, Iowa, the San Francisco Bay Area, Los Angeles/Orange Counties, California, and Colorado, she also consults with developing partnership initiatives in a half-dozen other states. Ms. Kidder's previous professional experience includes executive level management in state government and 8 years as professional staff in the U.S. Senate. She also served as the congressional affairs manager for the global engineering and construction firm, Bechtel Corporation. Immediately prior to joining BENS, she was the executive director of the North Bay Council, a nonprofit business leadership group in Northern California, where she led numerous collaborative initiatives between private employers, public officials and other civic leaders. She holds a B.A. from Indiana University, a master's degree from the University of Texas at Austin, and did additional postgraduate study in public administration at George Mason University.

Matthew Minson, M.D. (*Workshop Co-Chair*), is the senior medical officer for Strategic Initiatives at the Department of Health and Human Services (HHS)/Office of the Assistant Secretary for Preparedness and

Response (ASPR). He also serves on the Chancellor's Council for the University of Texas and is a principal member of the National Fire Protection Association's Technical Committee, 471, 472, and 473. Prior to joining HHS/ASPR, Dr. Minson was the director of the Maryland Department of Health and Mental Hygiene, Office of Preparedness and Response. He previously worked as the medical program coordinator for the National Emergency Response and Rescue Training Center located at Texas A&M University, and served on the Oil and Gas Industry's Corporate Emergency Response Team. He also held the position of director of emergency management and medical review for Harris County, TX. He was a Food and Drug Administration (FDA) sponsor-investigator during his appointment at the M.D. Anderson Cancer Center. He has been a CONTOMS physician in support of the Federal Bureau of Investigation, ATF, and the Texas Department of Public Safety. Dr. Minson is an expert on mass casualty medical management. He has responded to a number of disasters, including the World Trade Center, the Columbia Shuttle recovery, several hurricanes, and most recently Hurricanes Katrina and Rita. Dr. Minson received his M.D. from the University of Texas Medical Branch and completed his residency in Anesthesiology at the University of Texas Medical School, Houston.

Prasith (Sid) Baccam, Ph.D., is senior scientist for Innovative Emergency Management (IEM), Inc., Bel Air, MD. IEM is a risk management company providing services to private industry and government agencies. He received his Ph.D. in Applied Mathematics and Immunobiology from Iowa State University. Dr. Baccam was a postdoctoral research associate at the Los Alamos National Laboratory.

Bruce Baker is the Strategic National Stockpile (SNS) coordinator for the state of Maryland. He joined the Maryland Department of Health and Mental Hygiene after a successful career as a Fleet Marine Force Enlisted Warfare Specialist Chief Hospital Corpsman. His prior assignments included: leading chief petty officer of the National Naval Medical Pharmacy; plans operations and medical intelligence officer onboard the USNS Comfort, deployed during Hurricanes Katrina and Rita; medical operations chief for 3rd Battalion 24th Marines; and medical planning chief for the 1st Marine Expeditionary Brigade. He has been awarded four Navy Commendation Medals, five Navy Achievement Medals, six Good Conduct Medals, a Humanitarian Service Medal, and a Sea Service Deployment Ribbon.

Teresa Bates, L.V.N., is the SNS coordinator for Tarrant County (TX) Public Health. She has worked in public health for 8 years and preparedness for 5 years. Ms. Bates is responsible for the development and maintenance of the SNS plan, collaboration with external partners, and oversight of the Corporate Point of Dispensing Program. In 2007 that program was selected as a Model Practice by the National Association of County and City Health Officials (NACCHO). Previously Ms. Bates was a public health nurse in a community immunization clinic. Before entering public health she worked as a critical care nurse at John Peter Smith Hospital. In 1995 she graduated from the John Peter Smith Hospital Vocational Nursing School.

Anthony Begando is the chief executive officer (CEO) of Tenon Consulting Solutions, Inc. Headquartered in Alpharetta, GA., Tenon provides management and operational development consulting services to commercial and public-sector organizations. Mr. Begando is a seasoned executive with broad experience forming, developing, and leading both private and public corporations across several industry sectors. Mr. Begando has worked extensively with Business Executives for National Security and other nonprofit organizations in developing public and private solutions targeted at protecting the community and its assets from the effects of a large-scale disaster or attack. This includes specific initiatives aimed at large-scale pharmaceutical mass dispensing, catastrophic natural disaster response and recovery, and collaborative pandemic disease management initiatives. Through his work at Tenon, Mr. Begando has also spearheaded the development of the Business Operations Center concept, targeted at integrating private-sector capabilities into existing state and local emergency management infrastructures. He served for 3 years as an Army combat medic in Germany. Mr. Begando is a graduate of the University of Redlands, where he studied Economics and Information Systems.

Richard E. Besser, M.D. (*Session Chair*), serves as director of the Center for Disease Control and Prevention's (CDC's) Coordinating Office for Terrorism Preparedness and Emergency Response (COTPER) and is responsible for CDC's public health emergency preparedness and emergency response activities. COTPER is the primary CDC/Agency for Toxic Substances and Disease Registry organization tasked with oversight of terrorism preparedness, response, and protection for the nation

from biological, chemical, radiological, and naturally occurring emergencies. Dr. Besser began his career at CDC in the Epidemic Intelligence Service, working on the epidemiology of foodborne diseases. He has served as epidemiology section chief in the Respiratory Diseases Branch; acting chief of the Meningitis and Special Pathogens Branch in the National Center for Infectious Disease; and medical director of "Get Smart: Know When Antibiotics Work," CDC's national campaign to promote appropriate antibiotic use in the community. Dr. Besser received his B.A. in Economics from Williams College in Williamstown, MA, and his M.D. from the University of Pennsylvania. He completed a residency and chief residency in pediatrics at the John Hopkins University Hospital in Baltimore, MD.

Margaret Binzer, J.D., is a partner in Government Affairs, McKenna Long & Aldridge, LLP. Ms. Binzer is an experienced public policy and legal counselor who focuses on a variety of issues relating to food, dietary supplements, pharmaceuticals, medical devices, biotechnology, food, veterinary drugs, biodefense, pandemic influenza planning, and patient safety. In her role with McKenna Long & Aldridge, she concentrates her practice on health care and matters relating to the FDA. Previously, Ms. Binzer served as senior FDA health counsel to the Senate Budget Committee. She has also served as counsel to the Senate Health, Education, Labor, and Pensions (HELP) Committee. Earlier, Ms. Binzer worked for 7 years in multiple roles at the FDA, including as counsel to the director of the Office of Nutritional Policy. While with the Grocery Manufacturers of America as assistant general counsel, Ms. Binzer represented the grocery industry in the implementation of the Nutrition Labeling and Education Act. Ms. Binzer received her B.A. from Virginia Tech and her J.D. from the Marshall-Wythe School of Law, College of William and Mary, where she was a staff member of the *Administrative Law Review*.

Pam Blackwell, R.N., is the director of the Center for Emergency Preparedness & Response for Cobb/Douglas Boards of Health. Ms. Blackwell has 35 years of experience in emergency medicine and trauma care and served as the state trauma director for Georgia in the Office of Emergency Medical Services (EMS). The Center for Emergency Preparedness supports the "all-hazards" approach to planning and response and also recognizes the current emphasis on threats from biological, chemical, nuclear, radiological, and pandemic influenza incidents.

James S. Blumenstock, M.A., is the chief program officer for public health practice for the Association of State and Territorial Health Officials (ASTHO). His portfolio includes the state public health practice program areas of infectious and emerging diseases, immunization, environmental health, injury prevention, and public health preparedness and security, including pandemic influenza preparedness. Mr. Blumenstock also serves as a member of the Association's Executive Management Team responsible for enterprise-wide strategic planning, administrative services, member support, and public health advocacy. Before his arrival at ASTHO, Mr. Blumenstock was the deputy commissioner of health for the New Jersey Department of Health and Senior Services, from which he retired after nearly 32 years of career public health service. In this capacity, he had executive oversight responsibilities for a department branch of more than 650 staff and an operating budget of approximately $125 million. During his tenure, Mr. Blumenstock also represented the department on a number of boards, councils, and commissions, including the New Jersey Domestic Security Preparedness Task Force. Mr. Blumenstock received his B.S. in Environmental Science from Rutgers University and his M.A. in Health Sciences Administration from Jersey City State College.

David Brown is the director of global employee relations strategy for The Coca Cola Company. Mr. Brown has more than 20 years of varied, international human resources (HR) experience. He joined The Coca-Cola Company in January 2006 and assumed leadership responsibility for the critical need of accelerating the company's employee relations strategy and execution, working in close partnership with the Global Labor Relations Director and Global Human Resources Directors. His responsibilities include developing and deploying company strategies and programs in the areas of health and safety, infectious diseases, and HR policies in general. Mr. Brown is based at The Coca-Cola Company's Corporate Office in Atlanta.

Greg Burel is the senior executive service director, Division of Strategic National Stockpile, CDC. Before joining CDC, Mr. Burel spent 6 years at the Federal Emergency Management Agency (FEMA) Region IV, which represents the Southeastern United States. Serving as the director of the Administration and Resource Planning Division, he oversaw the activities of two branches responsible for the administrative, personnel, financial, acquisition, communications, information technology, facili-

ties, and disaster logistics operations. He worked in numerous declared disasters and emergencies as a logistics chief and Regional Operations Center director. He was responsible for all disaster logistics response and plans in the Southeastern United States. He has evaluated disaster operations both inside and outside of the United States and was a member of the FEMA Logistics Advisory Group. Mr. Burel holds a Bachelor of Business Administration degree from Georgia State University. He is a graduate of the Federal Executive Institute's Leadership for a Democratic Society. He has also completed numerous courses in process improvement, contracting, finance, and incident command.

Karen Drenkard, Ph.D., R.N., M.S.N., C.N.A.A., is chief nurse executive of Inova Health System, an integrated not-for-profit health care delivery system in northern Virginia. The Inova system has five hospitals, long-term care centers, multiple ambulatory settings, and home health services. She is currently serving as the chief nurse executive at Inova Fairfax Hospital/Fairfax Hospital for Children. She has broad leadership experience in nursing and clinical operations, quality improvement, organizational development, and management of large-scale change efforts. Her 20-year nursing history includes clinical experience in medical, oncology, and neurosurgical nursing, with experience as a nursing director, patient care administrator, nursing supervisor, director of patient care delivery systems, and quality management consultant. Dr. Drenkard's current areas of responsibility at Inova include nursing practice, strategic planning for nursing services system-wide, strategic leadership of the chief nurse executive team, patient safety, patient education, and clinical policy setting. She is a 2003 Wharton Nurse Executive Fellow, and a Robert Wood Johnson Nurse Executive Fellow, 2003–2006. In addition to her certification in nursing administration, advanced (C.N.A.A.) Dr. Drenkard is also a certified health care quality professional.

Stephanie Dulin (*Planning Committee Member*), is chief of the Program Preparedness Branch, Division of Strategic National Stockpile, CDC. Before becoming chief in 2006, Ms. Dulin was the Western Team Lead supervising program service consultants servicing the Midwestern and Western states. When Ms. Dulin joined the SNS in 2002, she was a program services consultant assigned to provide technical assistance in Arizona, Illinois, and the City of Chicago. Previously, Ms. Dulin was a CDC public health advisor providing direct technical assistance to the Arizona

Department of Health Services' Breast and Cervical Cancer Early Detection Program. From 1995 to 1998, she held various positions with the state of Florida, Department of Health, Bureau of HIV/AIDS. In total, Ms. Dulin has 21 years of public health programming experience at the federal, state, and local levels of government.

Jerry Ellsworth is the public health security coordinator for the Office of Public Health Preparedness (OPHP), Michigan Department of Community Health. He oversees the protection of the Michigan Department of Public Health, OPHP, the Public Health Emergency Operations Center in Lansing, and the SNS statewide. Mr. Ellsworth acts as liaison and educator for first responders and law enforcement by conducting training activities in public health and hospital bioterrorism preparedness. He retired from the Department of Michigan State Police, Special Operations Division in 2003 as a lieutenant after 26 years of service. At the time of his retirement, Mr. Ellsworth was the commanding officer of the Emergency Support Team, which is the state police version of a special weapons and tactics unit. Mr. Ellsworth holds a B.A. in business and management from Michigan State University.

Guy Farmer, J.D., is a partner at Holland and Knight, LLP, where he practices in the Labor and Employment Group. He is experienced in the representation of clients in a variety of industries, including paper companies, waste management, trucking, health care including hospitals, financial services, education, construction, and government contractors. Mr. Farmer represents employers locally, regionally, and nationally in the full range of employment-related issues. He has defended employers in more than 1,000 cases at both the trial and appellate levels in federal and state courts throughout the country involving allegations of employment discrimination and other employment- and labor-related matters. His litigation and appellate practice has included the defense of employers in cases involving individual claims, claims by federal and state governments, and significant class actions. Mr. Farmer holds a J.D. from the University of Virginia School of Law.

Paul Freibert, M.A., is a public health planner for the Louisville Metro Department of Public Health & Wellness in the state of Kentucky. In this role he coordinates public health emergency preparedness efforts with community-wide emergency planning. Mr. Freibert prepares and delivers community education on disaster planning and preparedness at the local

level. He has also been involved in partnering with numerous public and private agencies in developing community readiness and emergency response plans, including dispensing of the SNS, pandemic flu preparedness, and health and medical response. Mr. Freibert previously worked with the Center for Hazards Research at the University of Louisville, researching, and planning for, the impacts of natural hazard events on populations and the built environment. He earned a Master's in Urban Planning from the University of Louisville School of Urban and Public Affairs.

Donna Garren, Ph.D. (*Panel Leader*), is the vice president, health and safety regulatory affairs for the National Restaurant Association, headquartered in Washington, DC. Ms. Garren is a nationally respected food science specialist. Her extensive background and expertise in food science and nutrition is instrumental in building and enhancing the association's proactive efforts in food safety and nutrition, as well as addressing important regulatory and technical issues facing the nation's 900,000 restaurants. The mission of the Regulatory Affairs Department is to advise and represent the association and its membership on health and safety legislative and regulatory issues impacting the restaurant industry. Topics include public health and sanitation, nutrition food safety, indoor air quality, security, worker protection, building construction, equipment standards, and energy management. Ms. Garren joined the association after 6 years at the United Fresh Fruit & Vegetable Association (United), where she served as vice president, scientific and technical affairs. She was responsible for all produce food safety, food security- and food quality-related issues and activities, science-based regulatory and legislative activities, and technical consultation to United's membership. Before joining United, Ms. Garren worked for Boskovich Farms, Inc., in Oxnard, CA, as director of research and development and product safety. Her duties included the development and implementation of produce food safety programs and management of new product research and development projects. Ms. Garren graduated from Clemson University with a B.S. in Food Science and Nutrition, with a minor in Microbiology. She earned her doctorate in Food Science and Technology from University of Georgia.

Noah Glass is founder and CEO of Mobo, Inc., a remote mobile payments firm. Prior to founding Mobo, Glass was expansion manager at Endeavor Global, an innovative entrepreneurship-based international

development firm. The previous year, Glass worked with Braun Consulting, a strategy and technology consulting firm in Boston, where he helped to create an online ordering system for a major pharmaceutical firm. In 2000, Glass joined the Product Manager team at Shutterfly.com, a digital photo printing company, where he co-developed the Shutterfly Express application materials. Mr. Glass graduated from Yale University with a B.A. with distinction in Political Science.

Lynn Goldman, M.D., M.P.H. (*Planning Committee Member*), is a professor at the Johns Hopkins University Bloomberg School of Public Health in the Department of Environmental Health Sciences and the Department of Health Policy and Management. She is a pediatrician and an epidemiologist who focuses on environmental health policy, public health practice, and children's environmental health. In 1993, Dr. Goldman was appointed as assistant administrator for the Environmental Protection Agency's (EPA's) Office of Prevention, Pesticides and Toxic Substances, a position she held for more than 5 years. Prior to joining EPA, Dr. Goldman served in several positions at the California Department of Health Services, most recently as head of the Division of Environmental and Occupational Disease Control. She has served on numerous boards and expert committees, including the Committee on Environmental Health of the American Academy of Pediatrics, the CDC Lead Poisoning Prevention Advisory Committee, and numerous expert committees for the National Research Council. She is currently vice chair of the Institute of Medicine (IOM) Roundtable on Environmental Health Sciences and chair of the IOM Gulf War and Health Study. Dr. Goldman has a B.S. in Conservation of Natural Resources from the University of California, Berkeley, an M.P.H. from the Johns Hopkins University School of Public Health, and an M.D. from the University of California, San Francisco. She completed pediatric training at Children's Hospital, Oakland, CA.

Dan Guinn is the founder and director of compliance of Dispensing Solutions, Inc. (DSI). DSI is an FDA/DEA registered, state-of-the-art pharmaceutical packaging facility located in Southern California. As the provider of DispenseQuick™ point-of-care pharmaceuticals, DSI prepackages legend drugs, controlled substances (Schedule II, III, IV and V), vitamins, and nutraceuticals into our unit-of-use bottles. DSI also offer private-label and custom packaging services for oral solids, nutraceuticals, vitamins, antibiotics, injectables, schedule II–IV narcot-

ics, and more. Mr. Guinn has extensive experience in the packaging and distribution of pharmaceuticals and the implementation of electronic dispensing programs, in addition to developing a customizable first responder program that provides state, county, and local agencies with prepackaged, bar-coded medication designed for efficient dispensing under emergency situations.

David G. Henry, M.P.A., is a policy analyst at the National Governors Association (NGA) Center for Best Practices. In his role as a policy analyst, Mr. Henry works with the 56 state and territorial state homeland security advisors on matters of homeland security and public health preparedness. He has 10 years of progressive experience in nonprofit and government policy with a focus in homeland security and public health preparedness, congressional affairs, and management. Prior to joining NGA, Mr. Henry was a Capital City Fellow for the District of Columbia. He also served as the public health emergency and bioterrorism coordinator for the Monroe County (IN) government. Mr. Henry holds an M.P.A. in Local Government Management from Indiana University–Bloomington, and has completed coursework in Emergency Management from FEMA's Emergency Management Institute.

Jack Herrmann, M.S.Ed., N.C.C., L.M.H.C., is the senior advisor for public health preparedness at the National Association of County and City Health Officials, which represents the approximately 3,000 local public health departments across the country. He oversees NACCHO's preparedness portfolio, which consists of five federally funded programs aimed at enhancing and strengthening the preparedness and response capacity of local health departments. He is responsible for establishing the priorities for public health preparedness within the organization and serves as the organization's liaison to federal, state, and local partner agencies. Earlier, Mr. Herrmann was assistant professor of psychiatry and director of the Program in Disaster Mental Health at the University of Rochester Medical Center, Department of Psychiatry. During his 17 years with the university, Mr. Herrmann shared a wealth of experience in the fields of disaster mental health, suicide prevention, and employee assistance program (EAP) services. As the founder and former director of Strong EAP, Mr. Herrmann specialized in developing critical response teams for local police, fire, and health care organizations. He has also developed a disaster mental health training curriculum that is required for behavioral health and spiritual care response teams throughout New

York and Maine. Mr. Herrmann has also been a long-time volunteer with the American Red Cross. Since 1993, he has responded to numerous disasters, including the Northridge, CA, earthquake; the explosion of TWA Flight 800 off Long Island; and many hurricanes and floods. He was assigned as the mental health coordinator for the Family Assistance Center in New York City immediately following the attacks of September 11, 2001, and also assisted the Mayor's Office in coordinating the first and second year anniversaries of that event. In 2005 he was deployed as the client services administrator for the Hurricane Katrina relief operation (Louisiana), coordinating the health, mental health, and client casework services for the first 2 weeks following that storm. He held the same position a month later in Louisiana following Hurricane Rita. In 2006, Mr. Herrmann traveled to Lexington, KY, as the mental health manager following the crash of Comair Flight 5191. Mr. Herrmann earned a Master's in Education from the University of Rochester, is certified by the National Board of Certified Counselors, and is a licensed mental health counselor in the state of New York.

Christopher Hetherington, J.D., is the global crisis management officer for Citigroup's Office of Business Continuity. A senior vice president, he started with Citi in June 2006, after more than 2 years serving as the chief of staff for the New York City Police Pension Fund. While working for the fund, he initiated and directed business continuity and disaster recovery strategies, including the establishment of a "hot" site in one of the city's outer boroughs. Mr. Hetherington was a New York City police officer, supervisor, and executive corps member for more than 23 years, retiring in the rank of deputy inspector. For the last 2 years of his police department career, Mr. Hetherington served as deputy commissioner for homeland security in the city's Office of Emergency Management. He holds a Bachelor's from the University of Rochester, a Master's from the Naval Postgraduate School, and a J.D. from St. John's University School of Law.

Christopher Hoff is the emergency response coordinator for the Kane County Health Department in Aurora, IL. He directs planning, exercise, and response efforts for Kane County. Mr. Hoff also works on the national level with the NACCHO Pandemic Influenza Workgroup and on an ASTHO project to develop new guidance on pandemic preparedness with at-risk populations. Mr. Hoff has a Bachelor's in Biomedical Sci-

ence from Marquette University and is currently pursuing an M.P.H. at Northern Illinois University.

Sharona Hoffman, J.D., LL.M., is a professor of law at Case Western Reserve University with a secondary appointment in the Department of Bioethics. She is also the Law School's associate dean for academic affairs and co-director of the Law-Medicine Center. Earlier in her career, she clerked for a federal district court judge; worked as an associate at O'Melveny & Myers, a large Los Angeles law firm; and served as a senior trial attorney at the Equal Employment Opportunity Commission's Houston office. In 2007 Professor Hoffman spent 4 months as a guest researcher at CDC, working on liability and immunity issues related to public health emergencies. She has published more than 25 articles, most of which focus on health law and civil rights law. Her research interests include disability discrimination, biomedical research, health care coverage, race and medicine, the security of electronically stored health information, and emergency preparedness. Professor Hoffman received her B.A. magna cum laude from Wellesley College and her J.D. cum laude from Harvard Law School. In addition, she earned an LL.M. in health law from the University of Houston.

Robert Holman, III, M.S., is the senior planner in the Dallas County Department of Health & Human Services (DCHHS), Public Health Preparedness Division. He first joined the organization as the SNS Coordinator for Dallas County and has worked on bioterrorism preparedness and response planning since 2005. DCHHS response plans cover a range of issues, including pandemic influenza, disease surveillance, medical special needs shelters, and volunteer staging. Mr. Holman has been involved in disaster preparedness and planning since 1998, when he joined the American Red Cross. Beginning as an AmeriCorps volunteer, he advanced to director of emergency planning and coordinated the response plans for the Red Cross's local jurisdiction. He also served as an adjunct professor at the University of North Texas in its emergency administration and planning section, focusing on emergency planning and special populations.

Jeffrey Holmes (*Planning Committee Member*), is the director of PRTM, a management consulting firm, in its U.S. government practice. Mr. Holmes spent 20 years as an Army career officer in logistics prior to joining the commercial sector in several leadership roles. Mr. Holmes

previously served as president of Manugistics' worldwide sales organization. At Manugistics, he built the government aerospace and defense business from a start-up concept to a strategic business vertical, delivering more than 30 percent of the company's software revenues in 2003. He also held senior positions in logistics for Mars Incorporated in the United States, Canada, and Russia.

Nathaniel Hupert, M.D., is a practicing specialist in primary care internal medicine and a researcher in public health and medical decision making in the Departments of Public Health and Medicine, Weill Medical College of Cornell University. Since 2000, Dr. Hupert has directed a series of federally financed research projects on hospital and clinical preparedness for bioterrorism, using the resources of the New York Presbyterian Healthcare System as a model for national planning. In the course of this research, Dr. Hupert created a series of computer simulations to study mass antibiotic distribution and hospital capacity in the event of a large-scale anthrax attack or smallpox release. In 2001 he began collaboration with both New York City's Office of Emergency Management (OEM) and Department of Health to provide critical computer simulation expertise to the city in development of specific emergency response protocols for bioterrorism. He serves as a member of the Medical Management Committee, Bioterrorism Planning Section (OEM) and the Anthrax Modeling Working Group of the HHS Secretary's Council on Public Health Preparedness. Dr. Hupert has lectured nationally on bioterrorism preparedness for the CDC SNS program and the Agency for Healthcare Research and Quality. Dr. Hupert trained at Harvard Medical School, the University of Pittsburgh Medical Center, and the Harvard School of Public Health.

Jason F. Jackson, M.B.A. (*Planning Committee Member*), is the director of emergency management for Wal-Mart Stores, Inc. This department is responsible for mitigating, preparing and planning for, and orchestrating the response and recovery efforts for all forms of business disruptions globally, including natural and manmade disasters, security-related issues, significant epidemiological issues, and other emergencies. Previously, Mr. Jackson served as the senior manager over the Emergency Operations Center reporting to the director of business continuity. Mr. Jackson has worked in the Global Security Division of Wal-Mart since 2002. Just before working for Wal-Mart, Mr. Jackson worked as both a trooper/special agent for the Arkansas State Police and an assistant chief

for the Sylvan Hills Fire Department. Other experience includes several years of work in emergency services (i.e., fire, EMS, and law enforcement) at municipal, county, and state levels. Mr. Jackson holds an undergraduate degree in Emergency Administration and Management from Arkansas Tech University and graduate degrees in both Organizational and Business Security Management and Business Administration (M.B.A.) from Webster University, St. Louis, MO.

Mark Keeler is the program manager and state coordinator of the SNS for the Ohio Department of Health (ODH). He has designed the Ohio SNS program to include medical logistics and mass dispensing and vaccination guidance for all Ohio county health departments, in order to guide them in local preparedness and coordination with the ODH. He previously held the position of vaccine distribution manager for the ODH Bureau of Infectious Disease Control. In that role he designed clinic layouts for seasonal influenza clinics, designed clinic layouts for meningitis emergencies in Alliance, OH, and developed the CDC/Congress- established Vaccines for Children program for the state of Ohio.

Michael Kody, C.P.A., is the vice president of supply chain solutions for AmerisourceBergen. He is responsible for supply chain strategies deployment associated with inbound/outbound efficiencies, inventory management optimization, and technical infrastructure systems support. He is also responsible for optimizing manufacturer contract relationships and major business processes. Prior to joining AmerisourceBergen, Mr. Kody worked at PwC, where he was a business advisory director focused on supply chain process optimization for pharmaceutical companies. He has held office and regional leadership roles for PwC and earned the reputation for developing high-performing teams. Mr. Kody is a graduate of the University of Michigan and is a Certified Public Accountant.

Lisa Koonin, M.N., M.P.H. (*Planning Committee Member*), serves as senior advisor for pandemic preparedness partnerships in the Influenza Coordination Unit at CDC. The unit is responsible for all aspects of CDC's pandemic influenza preparedness activities. Ms. Koonin provides leadership and consultation for these activities as they relate to CDC's partners as well as HHS and other federal agencies. Ms. Koonin also provides direction for major initiatives linking public health agencies and the private sector for improving community-level emergency preparedness and serves as CDC's lead for private-sector pandemic influenza

planning and response. Ms. Koonin previously served as chief of the Private and Public Partners Branch in the Division of Partnerships and Strategic Alliances, National Center for Health Marketing, CDC. Ms. Koonin has also served as director for business partnerships for CDC. She was one of CDC's senior authors of the recently released pandemic Community Mitigation Guidance. Her team has produced numerous checklists and tools for businesses and educational, health, faith, and community-based organizations to use for pandemic influenza planning and preparedness. She also served as CDC's chief for Reproductive Health Surveillance for 12 years. Prior to joining CDC, Ms. Koonin spent 10 years in a variety of clinical and faculty nursing leadership positions. She is a family nurse practitioner and epidemiologist with a Master of Nursing degree and a Master of Public Health degree from Emory University.

Kenneth Kunchick (*Session Chair*), is a senior inspector for the U.S. Marshals Service (USMS). In 2007 Inspector Kunchick took over the role of training officer for the USMS Strategic National Stockpile Security Program. He is responsible for monitoring and setting up training for the USMS inspectors assigned to the program. In 2000, Deputy Kunchick was selected to attend the USMS Special Operations Group (SOG) class in Camp Beauregard, LA. He graduated SOG in 2000 and traveled to various locations throughout the nation in support of various high- threat events and court proceedings. He was also responsible for starting the SOG scuba team and assisted in writing SOP's and setting up training. He has been a guest speaker at many state and local meetings, including serving as a guest speaker for the SNS on their traveling road show in 2003 and for the 2006 SNS Stakeholders Conference in Washington, DC. Mr. Kunchick has 15 years of law enforcement experience and is a graduate of the U.S. Marshals training academy in Glynco, GA.

Eva Lee, Ph.D., is an associate professor in the H. Milton Stewart School of Industrial and Systems Engineering at Georgia Institute of Technology, and director of the Center for Operations Research in Medicine and Health Care. She is also a senior research professor at the Atlanta VA Medical Center. Dr. Lee was awarded a National Science Foundation (NSF)/NATO postdoctoral fellowship on Scientific Computing, and a postdoctoral fellowship from Konrad-Zuse-Zentrum Informationstechnik Berlin for Parallel Computation. In 1996, she received the NSF Presidential Young Investigator Award for research on integer programming and parallel algorithms and their applications to medical diag-

nosis and cancer treatment. She was the first OR/IE recipient for the prestigious Whitaker Foundation Biomedical Grant for Young Investigators, awarded for her work in combining biological imaging and optimal treatment design for prostate cancer. In 2004, she was selected as an Extraordinary Women Engineer. In 2005, she received the INFORMS Pierskalla award for research excellence in health care and management science for her work on emergency response and planning, large-scale prophylaxis dispensing, and resource allocation for bioterrorism and infectious disease outbreaks. Together, Dr. Lee and a Memorial Sloan-Kettering Cancer Center doctor were named winners of the 2007 Franz Edelman award for their work on using operations research to advance cancer therapeutics. Dr. Lee is currently the secretary and treasurer for the INFORMS Optimization Society, and a Subdivision Council member of the INFORMS Health Applications Section. She is co-editor for the *Annals of Operations Research* subseries: *Operations Research in Medicine—Computing and Optimization in Medicine and Life Sciences*. She is also issue editor for *Asia Pacific Journal of Operations Research on Medical and Biological Applications.* She also serves on the Editorial Board for *Cancer Informatics*. Dr. Lee has received seven patents for innovative medical systems and devices. Dr. Lee earned a Ph.D. at Rice University in the Department of Computational and Applied Mathematics, and received her undergraduate degree in Mathematics from Hong Kong Baptist University, where she graduated with Highest Distinction.

Jayne Lux, M.S., is director of the Global Health Benefits Institute of the National Business Group on Health. Previously, she was the director of board operations at the American Psychological Association, where she oversaw the activities of the Board of Professional Affairs. She also served as the liaison to the World Health Organization (WHO) for a collaborative project between the two organizations. Prior to joining the American Psychological Association, Ms. Lux served as a senior technical officer for WHO in Geneva, Switzerland, where she coordinated field trials in 18 countries for the development of the International Classification of Functioning, Disability and Health, a system used world-wide to describe human functioning in the context of health conditions. Additionally, she oversaw field activities in 19 countries for the development of a crossculturally applicable measure of disability. Ms. Lux's earlier experience included 4 years at Washington University School of Medicine, where she directed the Professional Development Office in the Program in Occupational Therapy. For the first 10 years of her career, Ms.

Lux was a supervisory speech-language pathologist in the Brain and Spinal Cord Injury Programs at the National Rehabilitation Hospital in Washington, DC. Ms. Lux is a member of the Global Health Council and the American Speech-Language-Hearing Association. She earned her B.S. and M.S. in Communication Disorders from Pennsylvania State University.

Robert P. Mauskapf, M.P.A., represents the Virginia Department of Health on Virginia's Emergency Response Team, Virginia's Preparedness Working Group, and The Governor's Secure Commonwealth Panel. He serves as his department's SNS coordinator, emergency coordination center director, and exercise coordinator. Before assuming his current duties in 2002, Mr. Mauskapf was as a career Marine Corps officer. He commanded at every operational level, from rifle platoon through light armored infantry battalion commander. He also served as an officer candidate training and recruit training company commander and as a base commander. He completed his military career as chief of staff, Marine Corps Forces Atlantic. Mr. Mauskapf then began working in the private sector as area vice president and regional president for a Fortune 500 company in the transportation, logistics, and distribution industry. Mr. Mauskapf holds a Master's in Public Administration and a Bachelor's in Business. He is a graduate of the Army War College, National Defense University, Armed Forces Staff College, and Defense Language Institute (Vietnamese and Thai) and University of North Carolina's Southeast Public Health Leadership Institute. He is on the adjunct faculties at Virginia Commonwealth University and Strayer University.

Wesley McDermott, M.S.P.H., is the public health emergency preparedness coordinator for Fairfax County, Virginia. In this role Mr. McDermott has contributed to the development of several key innovations in mass dispensing methods. Applying principles of systems engineering and disaster management, Mr. McDermott has led the implementation of volunteer mobilization systems, integrated dispensing modalities, and developed incident management protocols for public health disasters. He is a technical specialist for public health issues with the National Capital Region's All-Hazards Incident Management Team, and a member of the International Association of Emergency Managers. Mr. McDermott previously served as a medical corpsman and flight medic at Army installations in the United States and in Europe. He also has 17 years of experience working as a manager and administrator of

emergency medical services in Alabama, Mississippi, and California. Mr. McDermott holds an M.S. in Public Health from Tulane University and a B.S. in Health Services Administration from the School of Allied Health.

Jonathan Means, M.B.A., is senior vice president and general manager for Kelly Services, Inc. Kelly is a global staffing solutions company with its world headquarters in Troy, MI. Mr. Means joined Kelly in 1996 as a corporate account manager and later assumed the role of senior director, becoming responsible for Kelly's U.S.-based corporate accounts team. In 2001, he became vice president of the Automotive Services Group and in 2004 was promoted to vice president, east region manager of Kelly's Metro Markets Division. In 2005, Mr. Means was appointed to the position of vice president and general manager of the Major Markets Division and promoted to senior vice president in 2007. In 2008 he was asked to lead the newly formed Central Operations & Businesses, focusing on Kelly's Government Solutions unit, as well as the Kelly@Home business unit and its large account operations. Prior to joining Kelly, Mr. Means had more than 7 years of sales and management experience in the automotive supply industry. Mr. Means holds an M.B.A. from Wayne State University and a B.A. from Michigan State University.

Carter Mecher, M.D. (*Planning Committee Member*), is the Director for Medical Preparedness Policy on the White House Homeland Security Council. He supports the development of federal policies to enhance public health, biodefense, and pandemic preparedness. He served as a member of the White House National Strategy for Pandemic Influenza Writing and Implementation Team. He has served as the chief medical officer of the VA's Southeast Network since 1996. As chief medical officer, Dr. Mecher was responsible for all VA health care services in Georgia, Alabama, and South Carolina. Dr. Mecher received his undergraduate degree from the University of Illinois and his medical degree from Chicago Medical School. He completed a medicine residency and fellowship in critical care medicine at Los Angeles County-University of Southern California.

Scott A. Mugno, J.D. (*Planning Committee Member*), is the managing director for FedEx Express Corporate Safety, Health, and Fire Prevention. Mr. Mugno and his department of more than 100 employees develop, promote, and facilitate the safety and health program and culture for all non-flight FedEx Express domestic operations. His department

also provides technical support to the FedEx Express international operations and other FedEx operating companies. Mr. Mugno has been in the environmental, health, safety, or transportation arenas for 20 years. He joined FedEx Express in 1994 as a senior attorney in the Legal and Regulatory Affairs Department, handling a wide variety of environmental, health, safety, and transportation issues. In 2000, Mr. Mugno accepted the managing director of corporate safety position. Prior to FedEx, Mr. Mugno was division counsel at Westinghouse Electric Corporation's Waste Isolation Division and deputy staff judge advocate for the Eastern Region U.S. Army Military Traffic Management command. He has held other legal positions in the Army JAG Corps and in private-practice law firms. Mr. Mugno regularly represents FedEx at various trade and safety association and committee meetings and is a frequent speaker before those and other groups.

Erin Mullen, R.Ph., Ph.D., is the assistant vice president, Rx Response for the Pharmaceutical Research and Manufacturers of America (PhRMA). She oversees and manages the Rx Response program, which is an information-sharing forum composed of pharmaceutical manufacturers, distributors, pharmacies, hospitals, disaster relief agencies, and state and federal government agencies that help support the continuing provision of medicines to patients whose health is threatened by a severe public health emergency. Rx Response is prepared to serve during a severe natural disaster, large-scale terrorist attack, or a pandemic that disrupts the normal supply of medicines. Previously, Dr. Mullen practiced pharmacy in a variety of settings: as a community pharmacist, on the clinical adjunct faculty with the Colleges of Pharmacy at the University of Florida and Florida A&M University, and as a disaster responder. Dr. Mullen graduated from the Massachusetts College of Pharmacy with a B.S. in Pharmacy. She earned her Ph.D. in Microbiology and Immunology from the University of Miami.

John Murray is the vice president of circulation marketing for the Newspaper Association of America (NAA). He is responsible for the circulation marketing department and its efforts to provide marketing support for circulation executives and publishers. This includes facilitating discussion of key issues facing the industry and collecting and sharing the best readership and marketing solutions. He also serves as a resource to NAA's advertising customers on questions regarding newspaper circulation and readership. Mr. Murray joined NAA from the Fort

Wayne (IN) Newspapers, where he served as director of circulation for 7 years. Under Fort Wayne's joint operating agreement, Mr. Murray managed *The News Sentinel*, a 6-day afternoon newspaper and *The Journal Gazette*, a 7-day morning publication. He also served in Fort Wayne as marketing director for 5 years and had assignments in the advertising division. Mr. Murray is a graduate of Louisiana State University with a degree in marketing and economics.

Linda J. Neff, Ph.D., is a senior science officer in CDC's Coordinating Office for Terrorism Preparedness and Emergency Response, a position she has held since 2006. In this position, she serves as the principal investigator on the Home MedKit study, an evaluation of the preplacement of life-saving medicines in individual homes. Dr. Neff has worked in bioterrorism preparedness and emergency response since 2003. She served as senior epidemiologist in the U.S. Smallpox Preparedness and Response Activities and as associate director for preparedness in the National Immunization Program. She has served as the lead for several initiatives to inform national policy for preparedness and emergency response. She is a member of Mu Chapter of the Delta Omega honorary public health society and has received several awards for her work in public health, including the Emily Thompson Memorial Award for her research in women's health. Dr. Neff has authored more than 50 scientific articles and book chapters and has provided key contributions to community health.

Gerald W. Parker, D.V.M., Ph.D., M.S., is the principal deputy to the assistant secretary, Office of the Assistant Secretary for Preparedness and Response at HHS. The office coordinates HHS-wide efforts with respect to preparedness for and response to public health and medical emergencies, and serves as the focal point for coordination with other federal departments, agencies, and offices as well as state and local officials responsible for emergency medical preparedness and the protection of the civilian population. Previously, Dr. Parker worked at the Department of Homeland Security. He has 26 years of distinguished active U.S. Army service as a researcher, team leader, division director, program director, and laboratory director, beginning in 1977 and ending in 2004. Dr. Parker graduated from Texas A&M University with a B.S. in Veterinary Medicine and a D.V.M. He holds a Doctorate in Physiology from Baylor College of Medicine in Houston and an M.S. in Resourcing the National Strategy from the Industrial College of the Armed Forces.

Michael Robbins, Pharm.D., is a pharmacist in medical countermeasures and public health preparedness and response at the Chicago Department of Public Health. Under the Public Health Preparedness and Response Program, Dr. Robbins is the SNS coordinator and CDC Chempack Lead for the city of Chicago. He also serves as lead pharmacist for the Hospital Pharmacy Bioterrorism Subcommittee. Prior to joining the Department of Public Health, Dr. Robbins served as a health scientist and emergency response/technical advisory unit pharmacist for the CDC SNS Program. Dr. Robbins holds a Doctor of Pharmacy degree from the University of Illinois, College of Pharmacy.

Harvey Rubin, M.D., Ph.D., is the director of the Institute for Strategic Threat Analysis and Response at the University of Pennsylvania. He is also a professor of medicine, microbiology, and computer science. Dr. Rubin serves as the course director for the wilderness medicine elective, is the faculty councilor for Alpha Omega Alpha (AOA) medical honor society and the associate dean for student affairs in the School of Medicine. Dr. Rubin is also chair of the School of Medicine Committee on Appointments and Promotions and serves as a member of the School of Medicine Curriculum Committee. He joined the faculty at the University of Pennsylvania in 1983 and became a professor of medicine in 1998. He won the Donald B. Martin, M.D., Teaching Service Award in 1996. Dr. Rubin received his Ph.D. in Molecular Biology from the University of Pennsylvania and his M.D. from Columbia University. He was a house officer in medicine at The Peter Bent Brigham Hospital in Boston and did his fellowship in infectious diseases at Harvard and Brigham and Women's Hospital.

Larry Sabbath, M.A., is the executive director of the National Armored Car Association. For nearly two decades, Mr. Sabbath has counseled associations, coalitions, and corporations on a variety of government relations issues, including labor relations, financial services, environmental regulation, transportation, and privacy. He represents private security firms before Congress and federal agencies. Mr. Sabbath is a Capitol Hill veteran, having served Democratic members of the House of Representatives as staff director for three subcommittees with jurisdiction over issues affecting the Federal Trade Commission, small business, tax, antitrust, transportation, and the environment. Following his legislative positions, Mr. Sabbath joined Sellery Associates, Inc., as vice president. He represented clients in the private security and financial services in-

dustries. In 2005 he opened his own firm, Sabbath Government Relations, LLC. He holds a B.A. in Government and Politics from the University of Maryland and an M.A. in Political Science from the University of Nevada.

Michael Schrage is a fellow with the Massachusetts Institute of Technology (MIT) Sloan School's Center for Digital Business. He is also a senior adviser to MIT's Security Studies Program. He previously held the position of co-director of the Media Lab E-Markets Initiative at MIT. Mr. Schrage advises organizations on the economics of innovation through rapid experimentation, simulation, and digital design. His research and advisory work explores the roles of models, prototypes, and simulations as collaborative media for managing innovation risk. His ongoing work on strategic and just-in-time experimentation is at the core of several corporate transformation efforts. Formerly a director of Ticketmaster, he advises its parent InterActiveCorp., a leading provider of online transaction services worldwide. He has been an advisor/consultant to organizations such as Accenture, Google, Siemens, Wells Fargo, Microsoft, PwC, British Telecom, BP, Mars, and the Global Business Network. Mr. Schrage has presented invited papers on innovation economics for the Chemical Sciences Board of the National Research Council. He performs nonclassified work for the National Security Council, Defense Advanced Research Projects Agency (DARPA), and the Pentagon's Office of Net Assessment on command, control, and cyber-conflict management issues. He also helped set up the MIT/Center for Strategic and International Studies (CSIS) workshops on the design, acquisition, and procurement of complex systems.

Greg Sciarra, R.Ph., is the director of pharmacy operations for CVS/pharmacy. Mr. Sciarra manages the day-to-day operations of all 6,200 pharmacy locations, with a focus on improving service, quality, and productivity. Since 2002, he has been involved in many of CVS/pharmacy's emergency response plans, ranging from a single-store issue to large natural disasters such as Hurricane Katrina. He joined CVS in 2002 as manager of pharmacy operations, a position that involved managing all day-to-day pharmacy operations, including communications, policy and procedures, training programs, and assisting in the development of pharmacy labor standards. In 2003, Mr. Sciarra became director of pharmacy technology and managed a team of 18 people developing technological advancements to CVS's Pharmacy Legacy Sys-

tem, with direct responsibility to the current pharmacy filling system as well as managing pharmacy automation and robotics projects for the entire company. Early in his career, Mr. Sciarra served as a pharmacist and pharmacy supervisor in the New York City area. He is a member of the American Pharmacist Association, the Rhode Island Pharmacist Society, the Healthcare Information and Management Systems Society, and the Advisory Board of *Pharmacy Times*. Mr. Sciarra is a Registered Pharmacist with a degree in Pharmacy from the Albany College of Pharmacy.

James P. Shortal (*Panel Leader*), serves as Director of Business Continuity for Cox Communications, Inc. In this role, Jim is responsible to coordinate the planning and response activities against all threats for Cox's national network of cable TV, high speed internet and telephone services. He has been involved in the business continuity and disaster recovery field since 1989. Prior to Cox, Jim served as Director of Crisis Management and Business Continuity for The Home Depot, responsible for all stores, distribution centers and home offices in the United States, and support of international operations. He has also held several management positions with Wal-Mart Information Systems Division, managed his own business continuity consulting practice, and managed a network of disaster recovery hot sites during his career. Jim has been a speaker at numerous industry forums on emergency management issues, including the National Emergency Management Association, the National Hurricane Conference, numerous State Homeland Security Conferences, and the Rollins School of Public Health.

Michael Simko, R.Ph., is corporate manager of pharmacy health information technology for Walgreens Co. Mr. Simko has been a practicing pharmacist for more than 25 years.

Kevin Smith has worked since 2005 as a national disaster services specialist for America's Second Harvest, The Nation's Food Bank Network. Mr. Smith develops and trains food bank staff for disaster mitigation, preparedness, response, and recovery. He was formerly a three-term chairperson of the Florida Voluntary Organizations Active in Disasters (VOAD) and has served as the chair of the Mass Care Committee of National VOAD since 2006. He won the Distinguished Service Award at the 2002 National Hurricane Conference. Previously, Mr. Smith worked for The Salvation Army, Florida Division. Following September 11, 2001, he helped to establish the overall feeding operation at ground zero

in New York City and supported the Pentagon relief operations with two 48-foot feeding kitchens. He directed the Area Command for The Salvation Army relief to the 2004 hurricanes in Florida and directed recovery operations until joining America's Second Harvest.

Mary Steiner, R.N., B.S.N., is the emergency response nurse coordinator at the Oklahoma City–County Health Department (OCCHD). She is responsible for the development and maintenance of mass prophylaxis plans of operations. Included in OCCHD's dispensing plan of operations are pediatric emergency medication dosage tables that were developed in collaboration with pharmacy professors from the Oklahoma College of Pharmacy. These dosage tables have been posted on the SNS ListServ and have been submitted to the FDA for consideration. Ms. Steiner was formerly an administrator of a public health agency in eastern Colorado. She is a graduate of the University of Colorado Health Sciences Center, School of Nursing.

Boyd Stephenson is the American Trucking Association's (ATA's) manager for security and cross border operations. He joined ATA in 2007. He works with Customs and Border Protection, the Transportation Security Administration, and other government agencies to ensure that programs and rules are implemented in a manner that strengthens security without compromising operational efficiencies in the trucking sector. Before joining ATA, Mr. Stephenson worked in United Parcel Service's Office of Public Affairs. He graduated from Davidson College with a degree in Political Science.

WORKSHOP PLANNING COMMITTEE

Lynne Kidder, M.A., (*Workshop Co-Chair*), see Speaker bio.

Matthew Minson, M.D., (*Workshop Co-Chair*) see Speaker bio.

Ann M. Beauchesne is executive director of the U.S. Chamber of Commerce Homeland Security Division, which works to increase homeland security while maintaining the openness and mobility that are critical to the U.S. economy. She directs the Chamber's policy on emergency preparedness and response, cargo transportation, and critical infrastructure. She also works to identify and facilitate access to government contract-

ing opportunities for member companies in the homeland security area. Prior to joining the Chamber, Ms. Beauchesne worked for the National Governors Association for 10 years. She held a variety of positions, from policy analyst in the Natural Resources Division to program director of emergency management and environment. She also served as director of NGA's Homeland Security and Emergency Management Division, identifying policy priorities for governors and their homeland security advisors. Ms. Beauchesne has written extensively on issues related to homeland security, terrorism, emergency management, natural disasters, and nuclear weapons. In addition, she drafted the first *Governors' Guide to Homeland Security*.

Stephanie Dulin, see Speaker bio.

Perry L. Fri is the senior vice president of industry relations at the Healthcare Distribution Management Association (HDMA). Mr. Fri is responsible for the direction, supervision, and development of industry initiatives that facilitate improved business processes and operational efficiencies in the health care supply chain. Mr. Fri most recently served as vice president of industry relations and program development for the Health Industry Distributors Association (HIDA). Prior to joining HIDA, Mr. Fri was a consultant for The Hale Group. He was also vice president of industry alliances for Instill Corporation, and was the director of supply chain management for NWDA (now HDMA). Mr. Fri holds a B.A. in History from the University of Maryland.

Lynn Goldman, M.D., M.P.H., see Speaker bio.

Jeffrey Holmes, M.S., is the director of PRTM, a management consulting firm, in its U.S. government practice. Mr. Holmes spent 20 years as an Army career officer in logistics prior to joining the commercial sector in several leadership roles. Mr. Holmes previously served as president of Manugistics' worldwide sales organization. At Manugistics, he built the government aerospace and defense business from a start-up concept to a strategic business vertical, delivering more than 30 percent of the company's software revenues in 2003. He also held senior positions in logistics for Mars Incorporated in the United States, Canada, and Russia.

Jason F. Jackson, M.B.A., see Speaker bio.

Lisa Koonin, M.N., M.P.H., see Speaker bio.

Jon R. Krohmer, M.D., F.A.C.E.P., is the deputy assistant secretary and deputy chief medical officer of the U.S. Department of Homeland Security. Previously, he was an attending physician and director of EMS, Emergency Medicine Residency, Department of Emergency Medicine at the Spectrum Health Butterworth Campus in Grand Rapids, and an associate professor, Section of Emergency Medicine, College of Human Medicine at Michigan State University in East Lansing. Dr. Krohmer is the former EMS medical director of Kent County (MI) Emergency Medical Services and was the medical director for the West Michigan Metropolitan Medical Response System, the Kent County Medical Reserve Corps, and the Michigan Region 6 Bioterrorism Preparedness Consortium. He has been active in local, regional, state, and national domestic preparedness activities for many years. Dr. Krohmer has been very active with both the American College of Emergency Physicians (ACEP) (past chair of the EMS Committee and the Trauma Care and Injury Control Committee) and the Michigan College of Emergency Physicians (MCEP) (past president and past chair of the EMS Committee). He has been associated with the National Association of EMS Physicians (NAEMSP) since 1986, and is past president of that organization. He is a founding member of Advocates for EMS and is a past president. He is active in numerous other professional associations and organizations. Dr. Krohmer has received many awards and honors, including the 1998 ACEP Outstanding Contribution in EMS Award, the 2000 MCEP Meritorious Service Award, and the 2003 NAEMSP Ronald Stewart Award for Outstanding Contribution to EMS. He studied as an undergraduate of Ferris State College, School of Pharmacy in Big Rapids, MI. He is a graduate of the University of Michigan Medical School and completed his emergency medicine residency at Wright State University in Dayton, OH, where he was chief resident. Dr. Krohmer also completed a fellowship in EMS and Research at Wright State University. He is a fellow of the ACEP and a diplomate of the American Board of Emergency Medicine.

Patrick Libbey is the executive director of the National Association of County and City Health Officials (NACCHO), the national voice of local public health serving nearly 3,000 local public health agencies nationwide. Under his leadership, NACCHO works to support efforts that protect and improve the health of all people and communities by promoting

national policy, developing resources and programs, seeking health equity, and supporting effective local public health practice and systems. Most notably, Mr. Libbey is recognized for his work in the development of performance standards for public health practice. Prior to joining NACCHO in 2002, he was the director of the Thurston County Public Health and Social Services Department in Olympia, WA. The department includes divisions of personal health and environmental health, as well as assessment, planning, and epidemiology, and social services, including mental health, substance abuse, and developmental disabilities. For more than 20 years, Mr. Libbey was responsible for a mixed urban, suburban, and rural population of 210,000; supervised 115 employees; and managed a budget in excess of $30 million. He currently serves on the National Association of Counties Homeland Security Task Force. In 1993, he received NACCHO's Award for Excellence in Environmental Health and was a co-recipient of the First Annual Jim Parker Memorial Award for Washington state's systematic incorporation of core functions in its public health system. In 2002, he again was a co-recipient of the Jim Parker Memorial Award for work in developing Washington State's public health performance measurements.

Carter Mecher, M.D., see Speaker bio.

Scott A. Mugno, J.D., see Speaker bio.

Erin Mullen, R.Ph., Ph.D., see Speaker bio.

Cheryl A. Peterson, M.S.N., R.N., is a senior policy analyst for the American Nurses Association (ANA). She is responsible for researching and developing association policy related to preparing for and responding to a disaster, whether manmade or natural. Since 1998, Ms. Peterson has been actively involved in disaster planning at the federal level. In addition, she coordinated ANA's response to the tsunami disaster in Southeast Asia and to hurricanes during the 2005 U.S. hurricane season. Ms. Peterson spent 13 years in the Reserve Army Nurse Corps. In 1990, she was deployed during Operation Desert Storm. She also spent 7 years as an active volunteer in the Kensington (MD) Volunteer Fire Department.

Phillip Schneider is a senior executive with the National Association of Chain Drug Stores (NACDS). He is President of the NACDS Foundation

and also Vice President of External Affairs and Program Development for NACDS. The National Association of Chain Drug Stores represents 39,000 community pharmacies operating in the $750 billion retail pharmacy marketplace. As Foundation President, he is responsible for directing the Foundation's pharmacy education, research and charitable activities. In his Foundation role, Schneider has been responsible for raising over $15 million to support Foundation programs and activities. External Affairs and Program Development responsibilities include developing relationships with organizations representing the elderly, consumers and patient advocacy groups, as well as public health education outreach programs. He also is the Founder and Chair of the Board of Directors of the Sun Safety Alliance, an organization focused on educating the public about safe sun safety practices as a means to prevent skin cancer, a disease that kills one person every hour. Before joining NACDS, he was Group Vice President for Corporate Communications for the Medlantic Healthcare Group, a large Washington, DC, based hospital system. Prior to joining Medlantic, he held a variety of public relations positions with corporate headquarters staff of The Dow Chemical Company in Midland, Michigan, and also represented Dow in several major industry associations. In Washington, he currently serves as Chairman of the National Council on Patient Information and Education, and is a member of the Board of Directors of the Public Affairs Council, the national professional association for public affairs. He is the NACDS representative to RxResponse, a private sector coalition to help ensure the continued delivery of medications during major catastrophic events. Additionally, he is a director of the American Foundation for Pharmaceutical Education and also serves in a volunteer capacity with several professional and civic organizations. During the national health care reform debate, Phil played a leadership role in establishing and directing the Small Business Coalition on Health Care Reform (SBC), a coalition of 30 business organizations representing over 650,000 businesses employing more than 6 million individuals.

He began his career as a weekly newspaper editor, and for five years was editor-in-chief of a daily newspaper published in Michigan by the Hearst Corporation. Phil graduated with honors from Central Michigan University, where he earned a Master of Arts in Political Science, a Bachelor of Arts in Journalism and a Bachelor of Science in Political Science. He also was elected to serve two terms on the Midland, Michigan, City Council. While in Midland, he established a community foundation, as

well as served in leadership positions on the Boards of Directors for local Big Brothers, Junior Achievement and United Way programs.

FORUM MEMBERS

Lewis R. Goldfrank, M.D. (*Chair*), has worked at Bellevue Hospital Center and New York University (NYU) Medical Center for the last quarter century. He is currently the first chairman and professor of the newly established academic Department of Emergency Medicine at NYU, where his efforts have led to the development of the university's emergency medicine and medical toxicology residencies. Dr. Goldfrank is also the medical director of the New York City Health Department's Poison Center. His career has been spent working in the public hospitals of New York City, emphasizing the role of emergency medicine in improving access to care, public health, public policy, and medical humanism. He has assisted in numerous projects in South America, Asia, and Europe in the advancement of emergency medicine and medical toxicology, emphasizing his interests in the improvement of global health. Dr. Goldfrank recently has served on three committees (as chair for two of them) dealing with issues of terrorism: civilian medical response to chemical and biological terrorism; metropolitan medical response teams and preparedness for terrorism; and the psychological consequences of terrorism. Educated at Clark University, Johns Hopkins School of Medicine, and the University of Brussels, Belgium, he graduated from the University of Brussels Medical School in 1970. He completed his residency in Internal Medicine at Montefiore Hospital and Medical Center in 1973. He is a member of the Institute of Medicine.

Ann M. Beauchesne, see Planning Committee bio.

Joseph C. Becker is senior vice president of disaster services for the American Red Cross, a human service organization in existence since 1881. The American Red Cross is dedicated to providing relief to victims of disasters and helping people prevent, prepare for and respond to emergencies. Mr. Becker leads the organization's disaster relief. In this role, he has led the Red Cross' two largest relief efforts to date—the 2004 hurricanes in Florida, and the Hurricane Katrina response. He joined the national headquarters staff on January 1, 2004, as the vice president of response. Before assuming this role, he was the executive director of the

Greater Carolinas Chapter of the American Red Cross, starting in February 1997. His Red Cross involvement started much earlier as a member of the chapter Board of Directors from 1992 to 1996. Prior to his employment with the Red Cross, Mr. Becker was part of the management group of Kings Entertainment Company, with five regional theme parks in the United States and Canada, which was acquired by Paramount in 1992. At the end of his 23-year career with the company, Joe was the vice president of operations at Paramount's Carowinds. Born and raised in Cincinnati, Ohio, he received a degree in business administration from Miami University in Oxford, Ohio, in 1979.

Georges C. Benjamin, M.D. became executive director of the American Public Health Association, the nation's oldest and largest organization of public health professionals, in 2002. Prior to that, he was secretary of the Maryland Department of Health and Mental Hygiene, where he played a key role in developing Maryland's bioterrorism plan, following 4 years as the department's deputy secretary for public health services. Dr. Benjamin started his medical career in 1981 in Tacoma, Washington, where he managed a 72,000-patient visit ambulatory care service as chief of the Acute Illness Clinic at the Madigan Army Medical Center. A few years later, he served as chief of emergency medicine at the Walter Reed Army Medical Center. After leaving the Army, he chaired the Department of Community Health and Ambulatory Care at the District of Columbia General Hospital. He was promoted to acting commissioner for Public Health for the District of Columbia and later directed one of the busiest ambulance services in the nation as interim director of the Emergency Ambulatory Bureau of the District of Columbia Fire Department. Dr. Benjamin is a member of several committees, including CDC's director's advisory committee. He is currently serving on IOM's Board on Population Health and Public Health Practice, and has served on several other IOM and IOM/NRC committees: training physicians for public health careers; measures to enhance the effectiveness of CDC quarantine station expansion plan for U.S. ports of entry; evaluation of the metropolitan medical response systems program; and research and development needs for improved civilian medical response to chemical or biological terrorism incidents. He also serves on the boards of Partnership for Prevention and Advocates for Highway and Auto Safety. Dr. Benjamin is a graduate

of the Illinois Institute of Technology and the University of Illinois College of Medicine. He is board certified in internal medicine and is a fellow of the American College of Physicians. He is an IOM member.

Richard E. Besser, M.D., see Speaker bio.

Kathryn Brinsfield, M.D., M.P.H., is the Medical Director, Operational Medicine, Office of Health Affairs, in the Department of Homeland Security. Previously Dr. Brinsfield served as the medical director for Homeland Security, Boston EMS, for the Boston MMRS, and for the DelValle Emergency Preparedness Training Institute. She is co-chair of Massachusetts Surge Committee. She is also the supervisory medical officer for the International Medical and Surgical Response Team, and the Massachusetts–1 Disaster Medical Assistance Team. Dr. Brinsfield responded with these groups to Ground Zero on September 11th, as well as to numerous other deployments. She is an associate professor at the Boston University Schools of Medicine and Public Health. She graduated with honors from Brown University, received her M.D. degree from Tufts School of Medicine, and her M.P.H. degree from Boston University.

Robert G. Darling, M.D., F.A.C.E.P., Capt., M.C., U.S.N. (Ret.) is the Director of the Center for Disaster and Humanitarian and Assistance Medicine (CDHAM), at the Uniformed Services University of the Health Sciences (USUHS), F. Edward Hébert School of Medicine in Bethesda, Maryland. As CDHAM Director he is responsible for the overall management of numerous programs including: healthcare sector reconstruction efforts in Afghanistan, pandemic influenza preparation, mine victims assistance activities in Chad, HIV/AIDS educational initiatives in the Caribbean and South America, and other programs whose overall purpose is to advance the state of preparedness for and knowledge of humanitarian assistance and disasters worldwide. In addition, Dr. Darling has published, consulted, and lectured widely on the medical consequences of biological weapons. In 1996, Dr. Darling became the first board certified emergency medicine physician selected to serve the President of the United States as White House Physician. He served in the Clinton White House until October 1999. After completing his tour as White House Physician, Dr. Darling transferred to the Operational Medicine Division of the U.S. Army Medical Research Institute of Infectious Diseases, where he served as emergency physician and flight sur-

geon for the Aeromedical isolation team. In 2004, he accepted a position as Director of the Navy Medicine Office of Homeland Security, Bureau of Medicine and Surgery, where he was responsible for guiding Navy hospitals and clinics worldwide to prepare for the medical consequences of natural and man-made disasters. He held this position until his retirement from the Navy with the rank of Captain in October 2006. A member of the President's Advisory Council, Dr. Darling was elected to the Adelphi University Board of Trustees in 2004. Dr. Darling holds a M.D. from Uniformed Services University of the Health Sciences and a B.S. in Biology from Adelphi University. He attended the Naval Aerospace Medical Institute where he completed basic flight training and was designated a Naval Flight Surgeon in 1987. He completed his residency in emergency medicine at the Naval Medical Center in 1994. Lawrence Deyton, M.D., M.S.PH became chief public health and environmental hazards officer at the Veterans Health Administration (VHA) in January 2006. He is also associate professor of medicine and of health policy at the George Washington University School of Medicine and Health Sciences, where he holds a weekly clinic at the Washington, DC, VA Medical Center, which cares for veterans with HIV, infectious diseases, and hepatitis C. Prior to his current VHA position, Dr. Deyton had served since 1998 as chief consultant for VHA's public health programs, building policies and programs in HIV, hepatitis C, and emerging infectious diseases on behalf of health care providers and patients in the health system. Before that, he led research programs in the National Institute of Allergy and Infectious Diseases at the National Institutes of Health for 11 years, formulated policy for the Office of the Assistant Secretary for Health of the Department of Health and Human Services for 6 years, and served as a legislative aide with the House of Representatives Subcommittee on Health and the Environment. Dr. Deyton is a graduate of Kansas University, the Harvard School of Public Health, and the George Washington University School of Medicine.

Jeffrey Duchin, M.D., is chief of the Communicable Disease Control, Epidemiology & Immunization Section for Public Health – Seattle & King County, Washington, and associate professor of medicine, Division of Infectious Diseases at the University of Washington. He holds appointments as adjunct associate professor in the schools of Public Health and Community Medicine and Health Services, and Faculty, Northwest Center for Public Health Practice. He is also the director of emergency response for the WAMI Regional Center of Excellence (RCE) in Biode-

fense and Emerging Infectious Disease Research. Dr. Duchin trained in internal medicine at Thomas Jefferson University Hospital followed by a fellowship in general internal medicine and emergency medicine at the Hospital of the University of Pennsylvania. He did his infectious disease subspecialty training at the University of Washington. He is a graduate of the Centers for Disease Control and Prevention's (CDC's) Epidemic Intelligence Service, assigned to the National Center for Infectious Diseases during which time he received the Outstanding Unit Citation for exemplary performance of duty, the Secretary's Recognition Award for exceptional performance in the investigation of unexplained deaths associated with an outbreak of acute illness of unknown etiology in the Four Corners area of the southwestern United States, and the Achievement Medal, Department of Health and Human Services. Dr. Duchin subsequently worked for CDC as a medical epidemiologist in the Divisions of Tuberculosis Elimination and HIV/AIDS Special Studies Branch before assuming his current position. He is a fellow of the American College of Physicians and of the Infectious Disease Society of America (IDSA), where he chairs the IDSA's Bioemergencies Task Force and is a member of the Pandemic Influenza Task Force. He is a liaison representative from National Association of City and County Health Officials to the Center for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP). Dr. Duchin was a member of the Department of Health and Human Services 2004 Tiger Team consulting with Government of Greece on health preparations for the 2004 Olympics, Athens, Greece. Since 1999, when the World Trade Organization Ministerial came to Seattle, he has been actively working to strengthen the ties between public health, clinicians and the health care delivery system and to improve the response of the health care system and clinicians to public health emergencies, including biological terrorism and pandemic influenza. He is active in local, regional and national preparedness planning activities for communicable disease emergencies, recently including pandemic influenza. Dr. Duchin's peer review publications and research interests focus on communicable diseases of public health significance, and he has authored text book chapters on the epidemiology of HIV/AIDS, bioterrorism, and outbreak investigations.

Ellen P. Embrey is the Deputy Assistant Secretary of Defense for Force Health Protection and Readiness in the Office of the Assistant Secretary of Defense for Health Affairs. She oversees Department-wide efforts to develop and implement policies and programs relating to DoD deploy-

ment medicine, force health protection, national disaster support, and medical readiness for 2.3 million Service members. She directs her Health Affairs and TRICARE Management Activity staffs to proactively initiate policies and programs that address deployment-related health threats to the welfare of U.S. Service members and their families, as well as integrate medical lessons learned from previous conflicts into current policy, doctrine and practice. This dynamic process involves all components of the military health care system, emphasizing the relationship between military medicine and the fighting forces it supports. The health care policies and programs overseen or developed under Ms. Embrey's direction have ensured the health care needs were met for the more than 1.4 million Service members who have deployed to Operations Enduring Freedom and Iraqi Freedom since 2001, as well as providing comprehensive deployment health information to their families. Before coming to Health Affairs, Ms. Embrey held a variety of senior and executive level positions in the Office of the Assistant Secretary of Defense for Reserve Affairs (OASD/RA) from 1987–2002, where she worked to ensure that the reserve components of the U.S. Armed Forces, which make up more than half of the U.S. military, were adequately trained, equipped and ready to serve when required. Prior to her OASD/RA assignments, Ms. Embrey held staff and management positions at the Defense Contract Audit Agency Headquarters (1981–1987) and the U.S. Office of Personnel Management (1978–1981). She began her career as a management intern at the U.S. Civil Service Commission (1976–1978), following her graduation from Virginia Tech in 1976 with a Bachelor of Science degree.

Lynn Goldman, M.D., M.P.H., see Speaker bio.

James J. James, M.D., Dr.P.H., M.H.A., is the director of the American Medical Association's (AMA's) Center for Disaster Medicine and Emergency Response. He is responsible for managing and developing a comprehensive medical and public health program for AMA's response to terrorism and other disasters. He works with the Department of Health & Human Services and state and local medical societies to share information, implement communications strategies, and coordinate medical and public health agencies' response in the event of a terrorist attack or other sweeping disaster. Dr. James served as director of the Miami–Dade County Health Department from 2000 through 2002. In this role, he was responsible for overseeing public health programs throughout the county,

and was instrumental in dealing with the anthrax-related incidents that occurred after the September 11, 2001, terrorist attacks. Under Dr. James's leadership, Florida developed a comprehensive plan to respond to future bioterrorist events. He was appointed to Florida Governor Bush's Domestic Security Task Force and as lead health agent for preparedness and response for Region 7, which encompasses the counties of Miami–Dade, Broward, Palm Beach, West Palm Beach, and Monroe. During his tenure, the Miami-Dade Health Department was awarded the Governor's Sterling Award in 2002, which is conferred on businesses and organizations in Florida to acknowledge performance excellence in management and operations. Dr. James served for 26 years with the U.S. Army Medical Department in a variety of roles, including surgeon general (Eight Army, United States Forces Korea) and commanding general (William Beaumont Army Medical Center). He is an epidemiologist and is board-certified in preventive medicine. He holds a doctorate in medicine from the Cincinnati College of Medicine and a doctorate in public health from UCLA School of Public Health. He also holds a master's degree in healthcare administration from Baylor University. He attended the Armed Forces Staff College and the Industrial College of the Armed Forces.

Harvey E. Johnson, Jr., M.S., U.S.C.G., retired Vice Admiral became the deputy administrator and chief operating officer of the Federal Emergency Management Agency (FEMA) in April 2006 after serving as commander, Pacific Area of the U.S. Coast Guard, since June 2004. Mr. Johnson has a wealth of emergency and crisis management experience, including support to Admiral Thad Allen and the Coast Guard's Hurricane Katrina response efforts by coordinating and deploying West Coast resources. His operational experience includes various Coast Guard efforts, including search and rescue, freighter grounding, and vessel breakup and pollution response for the motor vessel Selendang Ayu and the tank vessel Seabulk Pride in Alaskan waters. In addition, he participated in multiple Naval War College, Lead Shield, and Rogue Vessel exercises in response to simulated maritime homeland security threats, and the management of hundreds of Coast Guard law enforcement, search and rescue, and pollution response cases in the Pacific. Prior to this assignment, he was the commander, Seventh Coast Guard District, and served as the director, Homeland Security Task Force-Southeast, where he directed Operation Able Sentry, the Department of Homeland Security's response to the crisis in Haiti. In addition to these duties, he served as the

executive director of the Coast Guard's transition into the Department of Homeland Security, and director of operations capability and director of operations policy. Mr. Johnson received a B.S. degree at the U.S. Coast Guard Academy in 1975. He earned an M.S. degree at the Naval Postgraduate School in 1983, and an M.S. degree in management at the Sloan School of Management at the Massachusetts Institute of Technology in 1993.

Jerry Johnston, B.A., REMT-P, is the emergency services (EMS) director at Henry County Health Center (HCHC) in Mt. Pleasant, Iowa, a countywide all-ALS system. In addition to his duties in Henry County, he also manages a BLS/ALS/Critical Care transport service located in Burlington, Iowa, which is partly owned by HCHC. In 1998, HCHC EMS was the recipient of NAEMT's Paramedic Ambulance Service of the Year award. In 2001, he was the recipient of NAEMT's William Klingensmith EMS Administrator of the Year award. He has been employed by private as well as hospital based EMS systems. While his current role is that of administrator, he has held positions of EMT-B, EMT-I, staff paramedic, training officer, EMT-B training program and continuing education coordinator, and paramedic instructor. He has instructed all levels of EMS providers, as well as BLS, ACLS, and PALS. Mr. Johnston serves on a variety of local, state, and national organizations and associations. He has presented at numerous regional, state and national EMS conferences. He is currently president of the National Association of EMTs, an organization in which he has served on the Board of Governors, Executive Council, and Board of Directors, and as treasurer and president elect. He is a past president of the Iowa EMS Association, was the first chair of NAEMT's Pediatric Prehospital Care Executive Council, and is a past BLS national faculty member for the American Hospital Association. Mr. Johnston holds a B.A. degree in business management and economics, and is a nationally registered paramedic.

Robert Kadlec, M.D., M.T.M.&H., M.A., is the special assistant to the President for homeland security and senior director for biological defense policy in the White House Homeland Security Council. Prior to his appointment, he was the director for Biodefense and Public Health at PRTM Management Consultants. Previously, he served as staff director for the Senate Subcommittee on Bioterrorism and Public Health, where he oversaw the drafting of the Pandemic and All-Hazards Preparedness Act (PL 109-417). The law, signed by President Bush on December 19,

2006, improves the functioning of Project BioShield of 2004 and reauthorizes the Bioterrorism Preparedness Act of 2002. Before that, he served as director for BioDefense Preparedness and Response at the White House Homeland Security Council from February 2002 until March 2005, where he was responsible for coordinating medical issues pertaining to the threat of bioterrorism with the National Security Council and the Federal Interagency. He conducted the BioDefense End-to-End Assessment and was instrumental in drafting Homeland Security Presidential Directive 10, The National BioDefense Policy for the 21st Century. In his military career, he was assigned to the Joint Special Operations Command at Fort Bragg, North Carolina, and the 16th Special Operations Wing at Hurlburt Field, Florida. He also served in senior advisory roles in the Office of the Secretary of Defense for Policy and the Central Intelligence Agency. Dr. Kadlec holds an M.D. and an M.T.M.&H. (tropical medicine and hygiene) from the Uniformed Services University of the Health Sciences; an M.A. in national security studies from Georgetown University; and a B.S. from the United States Air Force Academy. He is board certified in Aerospace and Preventive Medicine. He is a graduate of the Air War College.

Lynne Kidder, (*Workshop Co-Chair*) see Speaker bio.

Jon R. Krohmer, M.D., F.A.C.E.P., see Planning Committee bio.

Michael G. Kurilla, M.D., Ph.D. is the director of the Office of Biodefense Research Affairs and associate director for Biodefense Product Development for the National Institute of Allergy and Infectious Diseases (NIAID). His primary role is to provide overall institute coordination for product development of medical countermeasures against bioterror threats. At the University of Virginia, he was an assistant professor of pathology as well as co-director of the Laboratory of Molecular Diagnostics and associate director for clinical microbiology. Dr. Kurilla moved to the private sector working in anti-infective drug development at Dupont Pharmaceuticals, Bristol-Myers Squibb, and Wyeth. He subsequently joined NIAID as a medical officer. In 2005, he was named to his current positions within NIAID. He received his undergraduate degree in chemistry from the California Institute of Technology. He earned his M.D.-Ph.D. from Duke University. Dr. Kurilla took his postgraduate medical training in pathology at the Brigham & Women's Hospital in Boston, Massachusetts, and a postdoctoral fellowship with Dr. Elliott

Kieff at Harvard Medical School as a Life Sciences Research Foundation fellow, followed by a Markey Scholar Award.

Patrick Libbey is the executive director of the National Association of County and City Health Officials (NACCHO), the national voice of local public health serving nearly 3,000 local public health agencies nationwide. Under his leadership, NACCHO works to support efforts that protect and improve the health of all people and communities by promoting national policy, developing resources and programs, seeking health equity, and supporting effective local public health practice and systems. Most notably, he is recognized for his work in the development of performance standards for public health practice. Prior to joining NACCHO in September 2002, he was the director of the Thurston County Public Health and Social Services Department in Olympia, Washington. The department includes divisions of personal health and environmental health, as well as assessment, planning, and epidemiology; and social services, including mental health, substance abuse, and developmental disabilities. For more than 20 years, Mr. Libbey was responsible for a mixed urban, suburban, and rural population of 210,000, supervised 115 employees, and managed a budget in excess of $30 million. He currently serves on the National Association of Counties Homeland Security Task Force. In 1993, he received NACCHO's Award for Excellence in Environmental Health and was a co-recipient of the First Annual Jim Parker Memorial Award for Washington State's systematic incorporation of core functions in its public health system. In 2002, he again was a co-recipient of the Jim Parker Memorial Award for work in developing Washington State's public health performance measurements.

Jayne Lux, M.S., See speaker bio.

Margaret M. McMahon, R.N., M.N., C.E.N., F.A.E.N., is the emergency clinical nurse specialist at AtlantiCare Regional Medical Center - Mainland campus, in Pomona, New Jersey, former editor of Disaster Management & Response journal, and currently a Senior Clinical Editor for the Journal of Emergency Nursing. Ms. McMahon served on active duty and the reserves in the U.S. Army Nurse Corps, retiring as a Lieutenant Colonel. During her military career she served in a variety of positions, including Chief Nurse of a Neuro KE Team, Training Officer, Nuclear, Biological, & Chemical Defense Officer, and Assistant Nurse Manager – Receiving & Emergency, Da Nang, South Vietnam. Ms.

McMahon is a long time member of the Emergency Nurses Association, and served as National ENA President in 1987. She has over 40 years of professional nursing experience in clinical, administrative, and educational roles and has lectured and published extensively on disaster and emergency care topics. Ms. McMahon received her nursing diploma from Philadelphia General Hospital School of Nursing, her B.S. in Nursing from the University of Pennsylvania, and her Master of Nursing from the University of Washington. She is board certified in Emergency Nursing, a member of Sigma Theta Tau International Nursing Honorary, and a fellow of the Academy of Emergency Nursing.

Judith A. Monroe, M.D., is chair of the Association of State and Territorial Health Officials (ASTHO) and vice chair of the ASTHO National Preparedness Policy Committee. In December 2006, she traveled to Israel with a delegation from ASTHO for preparedness training with the first international delegation in the history of ASTHO and the start of an ongoing exchange with that country. She was appointed in March 2005 by Governor Daniels as the Indiana state health commissioner and medical director of Medicaid, and is a member of the National Governors Association Health Care Practice Task Force and Center for Best Practices Healthy Communities Work Group. She is a family physician at St. Vincent Hospital, whose medical staff she joined in 1992, serving as director of the Family Medicine Residency Program and the Primary Care Center until 2005. Dr. Monroe was clinical director with the Department of Family Medicine at Indiana University School of Medicine from 1990 to 1992. From 1986–1990 she also served in the National Health Service Corps, providing health care in rural Appalachia, during which she was featured with former Surgeon General C. Everett Koop in a documentary on the heath care crisis in America. She is chair of the Executive Board of Indiana Tobacco Prevention and Cessation, and a member of the Boards of Indiana Health and Information Exchange, Area Health Education Cooperative, and Reach Out and Read. Dr. Monroe received her undergraduate degree from Eastern Kentucky University and is a graduate of the University of Maryland School of Medicine. She did her postgraduate training at the University of Cincinnati, and is a fellow of the American Academy of Family Practice.

Erin Mullen, R.Ph., Ph.D., see Speaker bio.

Tara O'Toole, M.D., M.P.H., is CEO and director of the Center for Biosecurity at the University of Pittsburgh Medical Center (UPMC), and professor of medicine and of public health at the University of Pittsburgh. UPMC's Center for Biosecurity is an independent organization dedicated to improving the country's resilience to major biological threats. Prior to founding the center in 2003, Dr. O'Toole was one of the original members of the Johns Hopkins Center for Civilian Biodefense Strategies and served as its director from 2001 to 2003. She has served on numerous government and expert advisory committees dealing with biodefense. In 2004, she was elected Chair of the Board of the Federation of American Scientists, and in 2006 she was appointed to the Board of the Google Foundation's International Networked System for Total Early Disease Detection. From 1993 to 1997, Dr. O'Toole served as assistant secretary for Environment Safety and Health at the Department of Energy. Prior to that, she was a senior analyst at the Congressional Office of Technology Assessment, where she directed studies of the health impact of pollution resulting from nuclear weapons production, among other projects. Dr. O'Toole practiced general internal medicine in community health centers in Baltimore from 1984 to 1988. She is board certified in internal medicine and in occupational and environmental health. She has a bachelor's degree from Vassar College, an M.D. from the George Washington University, and an M.P.H. from Johns Hopkins University. She completed internal medicine residency training at Yale and a fellowship in Occupational and Environmental Medicine at Johns Hopkins University. At the National Academies, Dr. O'Toole served on the Working Group on Biological Weapons Control, and is currently serving on the Committee on Technical and Privacy Dimensions of Information for Terrorism Prevention and Other National Goals.

Gerald W. Parker, D.V.M., Ph.D., M.S., see Speaker bio.

Sally Phillips, R.N., Ph.D., joined the staff of CP3 in September 2001 as a Senior Nurse Scholar. She managed a portfolio that ranged from her primary area of bioterrorism to multidisciplinary education for safety and related health care workforce initiatives. Prior to joining the AHRQ staff, Dr. Phillips was a Robert Wood Johnson Health Policy Fellow and Health Policy Analyst for Senator Tom Harkin for 2 years. She brought a wealth of expertise in the area of multidisciplinary education, patient safety legislative initiatives, and curriculum with health professions education to her role at AHRQ. Dr. Phillips joined the AHRQ staff in Sep-

tember 2002 as the Director of the Bioterrorism Preparedness Research Program, now the Public Health Emergency Preparedness Program. She is an accomplished author, consultant, and speaker on public health and medical preparedness and response research initiatives. Dr. Phillips holds a Ph.D. from Case Western Reserve University in Cleveland, Ohio.

Steven J. Phillips, M.D., has served as deputy director for research and education at NLM/NIH since 1999. He is also the principal advisor to the chairman for medical affairs at Global Security Institute. In 2002, he became a founder and the chief medical officer of Cardiovascular Hospitals of America, LLC. He retired from that position in 2001, but remains an NIH contractor. He has been the principal investigator for numerous research projects. Dr. Phillips has enjoyed a highly successful career as a board certified general and thoracic surgeon, and is a business entrepreneur who has established several important programs and laboratories, and has been granted six patents. He established a cardiac surgery program at the University of Oregon to Des Moines, Iowa, which today is the Iowa Heart Center, a private medical group with a highly profitable business that has grown to more than 55 physicians and 300 employees specializing in cardiovascular disease. He developed a funded cardiovascular research laboratory at the College of Veterinary Medicine, Iowa State University. During the past 30 years, his team has implanted the first artificial heart in Iowa, performed the first heart transplant in central Iowa, and invented the technology for percutaneous cardiopulmonary bypass. Dr. Phillips received the Governor of Iowa Science Medal for his scientific efforts and he served as the national science advisor to the Iowa Department of Health. He retired from active medical practice in 2005, but he has active medical licenses in Iowa and Colorado. He is a graduate of Hobart College and Tufts University School of Medicine.

Jeffrey W. Runge, M.D., is the first assistant secretary for the DHS Office of Health Affairs. He is also the department's first chief medical officer, for which he serves as the principal advisor to the secretary for public health and medical issues across the department. He is board certified in emergency medicine and holds the title of clinical professor of emergency medicine, University of North Carolina at Chapel Hill. At DHS, he is responsible for coordination with other federal departments and agencies and the Homeland Security Council on issues of biodefense and medical preparedness. From March to August 2006, Dr. Runge served as the acting under secretary for the DHS Science and Technol-

ogy Directorate. In 2001, he was appointed by President Bush as the twelfth administrator of the National Highway Traffic Safety Administration, the federal agency responsible for the nation's highway and vehicle safety programs. Prior to this, he practiced and taught emergency medicine as assistant chairman of the Department of Emergency Medicine at Carolinas Medical Center in Charlotte. He was also the director of the Carolinas Center for Injury Prevention and Control, where he spearheaded injury prevention initiatives that were national in scope. His academic interest is in the field of trauma care and injury prevention. Dr. Runge earned his B.A. (magna cum laude) in 1977 from the University of the South, Sewanee, Tennessee, and received his M.D. degree from the Medical University of South Carolina in 1981.

Phillip Schneider, see Planning Committee bio.

Roslyne Schulman, M.H.A., M.B.A., has been a senior associate director for policy development at AHA since January 1999. In this capacity, she is responsible for policy development related to hospital preparedness for disasters. She is the co-lead of the AHA's staff team for hospital readiness and helps to lead AHA's efforts in this area. Ms. Schulman is AHA's liaison to CDC's Healthcare Infection Control Practices Advisory Committee. In addition, she has primary policy development responsibility in a number of other areas, including the Emergency Medical Treatment and Active Labor Act; Medicare hospital outpatient, physician, and ambulatory surgical center payment policy, and other Medicare Part B issues; Medicare contracting reform; rural health clinic issues; FDA policy issues regarding drugs, blood and devices; and other areas. Recently, she was principal investigator for AHA's federal contract with the Health Resources and Services Administration on hospital implementation issues and solutions on Emergency Systems for Advanced Registration for Volunteer Healthcare Professionals, and served as an ex-officio member of the Hospital Incident Command System National Working Group. From 1992–1999, she worked for the American College of Emergency Physicians as regulatory representative, and from 1990–1992, she was a legislative assistant with the American Group Practice Association. Ms. Schulman received her M.H.A. and M.B.A. from the University of Pittsburgh in 1989, and her B.S. from the University of Pennsylvania in 1984.

Linda J. Stierle, M.S.N., R.N., C.N.A.A., B.C., is chief executive officer of the American Nurses Association (ANA) and the American Nurses

Foundation. In this capacity, she develops and implements programs designed to meet the vision and goals of the association. She was instrumental in the creation of ANA's newest constituency for nurses in the uniformed services, the Federal Nurses Association (FedNA). In 2002, President Bush appointed her to a 5-year term on the Board of Regents of the Uniformed Services University of the Health Sciences, on which she currently serves as vice-chair. She was a long-time member of the Texas Nurses Association until February 2000. Ms. Stierle retired as a brigadier general in the U.S. Air Force Nurse Corps. She began her military career in 1970 as a staff nurse in intensive care. During her career, she held various clinical and management positions, including chief nursing officer at Lackland Air Force Base in San Antonio, Texas, the Air Force's largest medical center (1,000 beds) and at the 48th Tactical Fighter Wing Hospital, Royal Air Force, in Lakenheath, England. Ms. Stierle has both regional and national headquarters corporate experience. From 1995 until her retirement in 2000, she was assigned to Bolling Air Force Base, Washington, DC, as director, medical readiness, and was the twelfth Chief of the U.S. Air Force Nurse Corps. She is a member of the consumer advisory board of the American Academy of Family Physicians. She earned her M.S. in nursing from the University of California, San Francisco; her B.S. in nursing from Incarnate Word College, San Antonio, Texas; and a diploma in nursing from Spartanburg General Hospital in Spartanburg, South Carolina.

Margaret VanAmringe, M.H.S., is vice president for Public Policy and Government Relations at the Joint Commission, and heads the Joint Commission's Washington, DC, office. She is responsible for developing strategic opportunities for The Joint Commission in both the public and private sectors. To accomplish this, Ms. VanAmringe works with health care professional organizations, government agencies, the Congress, consumer organizations and large purchasers of health care. The Washington office is office is the Joint Commission's interface with the federal government and with public policy issues, such as patient safety, building a national health information infrastructure, emergency preparedness, and quality of care. It is also the office concerned with Medicare and Medicaid oversight of quality and its relationship to private sector accreditation; relationships with the Department of Defense; the Veterans' Administration; and the Public Health Service agencies. Prior to taking a position with the Joint Commission, Ms. VanAmringe was director for research and dissemination and liaison at the Agency for Health Care

Policy and Research (now the Agency for Health Research and Quality) in the U.S. Public Health Service. There she established programs to communicate health services research findings to a wide array of professional and public audiences. She established the agency's first health information dissemination program to bring practical information gleaned from health services research into the hands of consumers and their families, and to have more health services research information indexed into the National Library of Medicine. She also established an external grants program to explore effective methods for disseminating new medical information to physicians, and for changing medical treatment behavior to reflect evidence-based medicine. Between 1989 and 1990, Ms. VanAmringe was a legislative fellow in the office of the majority leader, Senator George Mitchell. From early 1987 through 1989, she held various positions in the Immediate Office of the Secretary, Department of Health and Human Services, including senior advisor, and acting deputy chief of staff. While there, she provided advice on the full range of social and health policy issues. Before joining the secretary's staff, she spent ten years working in the Health Care Financing Administration (now CMS), HHS, where she was Director of the Office of Survey and Certification, the component which was then responsible for developing health and safety standards for health care organizations reimbursed by Medicare/Medicaid, and for assuring that such federally funded entities met the government's expectations for delivering quality care. She also worked in the contractor oversight division that dealt with payment operations. Ms. VanAmringe holds a Master of Health Sciences degree from the Johns Hopkins School of Hygiene and Public Health.

Theresa L. Wiegmann, J.D., is director of public policy and special counsel for the AABB (formerly known as the American Association of Blood Banks). She represents AABB before Congressional offices and federal agencies, where she advocates the interests of the transfusion medicine and cellular therapy communities on a variety of public health issues, including blood safety and availability, Medicare inpatient and outpatient reimbursement, patient safety initiatives, and disaster preparedness. Prior to joining the AABB in 1998, she practiced in a Washington, DC, law firm specializing in Food and Drug law and health-related legislative and regulatory matters. Ms. Wiegmann received her bachelor's degree from Duke University and her law degree from George Washington University.

IOM STAFF

Bruce M. Altevogt, Ph.D., is a senior program officer on the Board on Health Sciences Policy at the IOM. His primary interests focus on policy issues related to basic research and preparedness for catastrophic events. He received his doctorate from Harvard University's Program in Neuroscience. Following more than 10 years of research, Dr. Altevogt joined The National Academies as a science and technology policy fellow with the Christine Mirzayan Science & Technology Policy Graduate Fellowship Program. Since joining the Board on Health Sciences Policy, he has been a program officer on multiple IOM studies, including *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem*, The National Academies' *Guidelines for Human Embryonic Stem Cell Research: 2007 Amendments*, and *Research Priorities in Emergency Preparedness and Response for Public Health Systems*. He is currently serving as director of the Forum on Medical and Public Health Preparedness for Catastrophic Events, the Neuroscience and Nervous System Disorders Forum, and as a co-study director on the National Academy of Sciences Human Embryonic Stem Cells Research Advisory Committee. He received his B.A. from the University of Virginia in Charlottesville, where he majored in biology and minored in South Asian studies.

Andrew M. Pope, Ph.D., is the director of the Board on Health Sciences Policy at the IOM. With a Ph.D. in physiology and biochemistry, his primary interests are in science policy, biomedical ethics, and the environmental and occupational influences on human health. During his tenure at The National Academies and since 1989 at the IOM, Dr. Pope has directed numerous studies on topics that range from injury control, disability prevention, and biologic markers to the protection of human subjects of research, National Institutes of Health (NIH) priority-setting processes, organ procurement and transplantation policy, and the role of science and technology in countering terrorism. Dr. Pope is the recipient of the National Academy of Sciences President's Special Achievement Award and the IOM's Cecil Award.

Marnina Kammersell, M.A., is a research associate at the Board on Health Sciences Policy. In addition to her work with the Forum on Medical and Public Health Preparedness for Catastrophic Events, she is currently assisting with the IOM's review of the Title X Family Planning Program. Prior to joining the IOM, she was a health science policy ana-

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Alex Repace is a senior project assistant on the Board on Health Sciences Policy. Currently, he is supporting the Roundtable on Translating Genomic-Based Research for Health. Previously, he worked for the Board on Army Science and Technology for the National Research Council. He also has experience in research grants administration in the areas of biological and physical sciences. Mr. Repace has a B.S. in Microbiology from University of Maryland at College Park and training and experience in public health.

Heather Kaiser is pursuing her Master of Public Health with a focus on health policy and public health preparedness from the Johns Hopkins Bloomberg School of Public Health. She is currently serving as a Board on Health Sciences Policy intern at the IOM to work on preparedness activities. She is also a medical student at the University of Cincinnati College of Medicine, and she will fulfill the remainder of her M.D. requirements on completion of her M.P.H. With increased exposure to medicine on a broader perspective while pursuing her M.P.H., Ms. Kaiser has continued to grow more ardent in her desire to contribute to furthering the practice of clinical medicine in the context of population-based research and policy formulation. In particular, she has developed an appreciation and inquisitiveness for improving health beyond individual patient encounters through preventive and protective measures.