Day Three: Regional Resiliency and Health Challenges in the Aftermath of Nuclear Terrorism

Report and Recommendations from
Day Three: Regional Resiliency and Health Challenges In the Aftermath of Nuclear Terrorism
Hosted by the National Center for Disaster Preparedness
Columbia University Mailman School of Public Health
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Executive Summary

On February 23, 2010, in New York City, the National Center for Disaster Preparedness at Columbia University Mailman School of Public Health (NCDP) convened a unique roundtable of experts to discuss the impacts on a major U.S. city and the surrounding region, of the detonation by terrorists of a 10-kiloton improvised nuclear device. Aware of the immediate impact of such a major catastrophic event, participants were nonetheless asked to focus on potential conditions and challenges in the affected region three days following the attack. The goal of the roundtable was to understand the nature and scope of these challenges and to frame questions considered essential for appropriate planning.

Day Three was premised on the notions that (a) while nuclear terrorism is a low probability event, it is by no means far-fetched; (b) consequences would be devastating and (c) emergency response planning to date falls far short in terms of assuring regional readiness at an appropriate scale.

A summary of the proceedings of this "not for attribution" conference comprises the body of this report. Key points made and questions raised during the course of the discussions include:

1. There was consensus among the participants that **no American city or region, even with abundant state and federal government and military support, has sufficient health care infrastructure and resources to handle the anticipated injuries and illness from the detonation of a 10-kiloton nuclear device**.

2. Participants agreed that a detonation likely would cause a difficult to control **spontaneous mass evacuation**, that evacuees would try to get at least 10-20 miles or more away from the detonation site, and that such an exodus would have significant adverse impacts on the communities through which it passed.

3. It was noted that federal, state and local responsibilities following a detonation are not adequately defined or integrated into a regional response plan, and that in general, the **roles, functions and planning needs of the surrounding communities do not receive appropriate attention**.

4. Several experts cited emerging evidence that the radioactivity of fallout decays very quickly and that **common urban structures can provide substantial protection from radiation**. Relatively short periods of "sheltering in place" followed by evacuation will be the most appropriate strategy to assure optimal survival.

5. Participants identified several **priorities that should receive substantial attention and significant additional resources:** regional communications capacity, IND-specific regional training and comprehensive exercises, hospital and health system capacity and coordination and intergovernmental coordination for an effective regional response.

In view of the panel discussions, NCDP, the roundtable's host, recommends that the following questions be addressed in future exercises and planning initiatives for possible IND detonations:

- It is assumed that the aftermath of an IND event, local, regional and national conditions may be extremely dynamic in unpredictable ways. **Is the response system equipped to switch gears dramatically and abruptly?**

- After 9/11, the federal government acted promptly to secure the nation against a follow-on attack, temporarily freezing most transportation and commerce. **How will incident commanders prevent such actions from interfering with the "just in time" supply chains on which state health and emergency management departments rely to maintain their supplies and equipment, and on which private sector logistics contractors rely to execute federal agencies' response plans?**

- Communications that persuade people to shelter in place during the first few hours, and in places with high protective factors, are critical. **Can the government get these messages out fast enough to take advantage of this window, especially if there has been an electromagnetic pulse? Do the messengers have sufficient credibility and public trust across a wide range of diverse communities?**

- **If the national government plans to have federal military and civilian personnel supplement local law enforcement resources and response efforts, does it have a communications plan in place to explain this as it is happening?**

- A mass self-evacuation could congeal highways, secondary roads and local streets spreading outward from the regional center, including many abandoned cars that have run out of gas. Such gridlock would compromise plans to mobilize first responders and transportation resources, move victims to treatment facilities, deploy local law enforcement, establish mobile hospitals and distribute state and federal relief and response supplies to where they are needed. **Who would take charge to address transportation paralysis? Would federal and state governments feel inhibited from violating property rights—driving tow trucks over lawns, commandeering parking lots, breaking into abandoned cars—in order to clear lanes for the necessary supply and response vehicles? Would the National Guard or military be willing or able to air lift in heavy equipment to participate in such an effort?**

- **How might a mass evacuation affect food supplies, water, sanitary and health systems and public order in communities at the destination communities and en route?**

- Without clear protocols, legal protections and command structures, who will make the decisions to (a) reopen hospitals initially closed due to fallout contamination; (b) create surge bed capacity through accelerated discharge of current patients; (c) triage patients and arrange for their movement to appropriate treatment facilities; (d) invoke and administer alternative standards of care; (e) provide palliative care and religious services for victims triaged to the "expectant" category; and (f) transport and provide custody for the bodies of decedents?

- The congregation of the "worried well" and citizens seeking information, solace or safety; inflows of people requiring decontamination; inadequate hospital security plans; and inconsistent or ill-chosen statements by public officials, all could impair functioning hospitals' ability to provide patient care. What will incident managers do to minimize such failures?

- What could incident commanders do if (as expected) many medical personnel, first responders, law enforcement personnel and volunteers do not report to the scene or assist victims due to widespread fear or misunderstanding of radiation and its effects? Or if they discover that estimates of available personnel have been inadvertently inflated by double counting (e.g., counting a nurse as a hospital employee, MRC member AND as a National Guard member)

- Are there duplicative requisition and approval processes that delay or compromise the overall federal response? Do high level federal demands for situational awareness and data interfere with efforts on the ground?

- Federal agencies view their role following an IND as "reacting" and "supporting" rather than directing, but what would federal leaders do if local leadership isn't forthcoming, for example, if state and/or local leadership is physically incapacitated, politically paralyzed or overwhelmed by the event?

- If sheltering in place is deemed necessary for an extended period—particularly in high rise buildings—how might this complicate the role of agencies like the Red Cross in delivering emergency food and water supplies? This is particularly pertinent if there has been an EMP that disabled elevators, refrigeration and other essential power-dependent infrastructure?

This report was prepared by NCDP and summarizes the key issues considered during the day-long meeting. Although there was substantial consensus among participants around the following issues, the roundtable did not entertain or make formal recommendations.

Key Issues and Consensus Findings Regarding Regional Preparedness for "Day Three"

1. Common Rationales for Avoiding Regional Planning and Preparedness must be Re-examined.

Introductory speakers opened the proceedings by acknowledging that even in the face of compelling evidence and a strong political consensus that nuclear terrorism is a significant national security issue, some observers do not consider preparing a regional response to nuclear terrorism a good idea or good use of resources. They discussed many of the reasons commonly offered for avoiding the subject, including psychological denial, fatalism, and an outdated and inaccurate Cold War notion that a ground-level detonation of a 10-Kt IND would vaporize everyone and everything. Many local emergency preparedness and response officials unconsciously subscribe to this notion and react to the idea of regional planning for an IND event with a variant of "it doesn't matter; we're all dead, anyway."

Some officials are daunted by the cost of preparing for such an incident when the U.S. faces so many other urgent and expensive challenges. Other potent barriers to a regional planning effort include the enormous number of federal agencies with jurisdiction over and responsibilities for nuclear terrorism preparedness, the siloization of many agencies and funding streams, and the complexity of Congressional oversight of nuclear and security issues.

The detonation of an IND in a large city would be a disaster on an epic, unprecedented scale, causing far more damage, casualties and injuries than anything America had experienced previously. Hospitals, emergency response, transportation, communications and other critical infrastructure systems would be affected—possibly overwhelmed—and physical and psychological effects would be widespread. The loss of electricity, water, and basic communications would be a huge burden for rescue, recovery, and for daily living among the survivors. Yet there would be many survivors, and just a little greater awareness of what the public and the responders need to do could dramatically improve the outcome.

As one panelist described it, almost any improvement to the status quo of regional planning and preparedness could save tens or hundreds of thousands of lives. In his view, the key challenges of responding to an IND are minimizing avoidable exposures to radiation, reaching the victims, identifying those who can benefit from treatment, and then connecting them with America's huge medical resources. The goal is to avoid a "nuclear Katrina," in which people who could have survived through self-protective actions or with available medical treatment, died unnecessarily.

Several participants indicated that learning to deal flexibly with out-of-sequence, unplanned consequences is one of the most essential parts of emergency response planning and training. One commented that "we need to expect chaos," that incident

command would be severely downgraded and decisions would need to be made rapidly. Another offered the perspective that "you actually can't plan, from my opinion, for what you're talking about. You can plan for an array of possibilities. But you actually don't know."

2. Regional Actors Must Piggy-back IND Planning and Preparedness on All Hazards Preparedness

Speakers recommended building regional capacity and preparedness for an IND event incrementally, through ongoing training, collaboration and exercises. Wherever possible, all levels of government should deliberately build into their planning for non-nuclear events specific issues that they anticipate would arise following an IND detonation, and use those exercises as opportunities to crystallize issues and lessons that are germane to a regional IND response. As one participant stated, "practice makes you better at any event. And so you role a piece of this into any practice you do." For example:

- A major city may develop a plan and conduct exercises related to a potential 48-hour system-wide electrical blackout. Such an exercise could address some of the issues associated with the electromagnetic pulse from an air burst of an IND.

- Planning the emergency response to a major gas explosion in a large public facility or office building could illuminate many of the hospital and medical surge issues that would arise in the context of nuclear terrorism.

- Building complex triage issues into such plans and exercises—how to invoke and administer altered standards of care, how and where to transport victims requiring immediate treatment if there was transportation gridlock, how to provide palliative care and religious services to "expectant" victims, and how to address relatives' reactions to triage decisions—also would yield invaluable lessons.

3. Many Lives Can Be Saved Beyond a One Half Mile Radius from a 10 Kiloton Urban Ground Burst

If a ground level detonation occurred on a work day in the downtown of the largest American cities, over 100,000 people would die immediately within a radius of approximately one half mile. Further out, in a zone extending roughly .5 mile to 1 mile, there would be a large number of life-threatening injuries from the initial blast and the dynamic wind effects of the nuclear shockwave, including broken glass, façade damage in buildings, extensive flying rubble and debris in the urban canyon. Although the physical destruction in this zone would hinder evacuation and limit responders' access and mobility, many of the expected injuries could be successfully treated if medical resources were accessible. Furthermore, prompt protective action by the public could avoid most radiation-related illness in this zone. Still further out (1 to 3 miles out), injuries would result largely from window breakage and the buckling of large, flat surfaces and the fallout plume also would be a hazard. The

injuries in this zone are not yet-well modeled or understood, but the number of immediate injuries is assumed to be relatively light.

An air burst would change everything. Under certain conditions, a detonation above ground level would generate an "electromagnetic pulse" (EMP). One participant suggested that the EMP from a 10 Kt air burst could knock out all electronics and cause severe damage to power and telecommunication system in an area 2-3 times the radius of the major blast damage, and for an indeterminate period of time. A regional scale EMP could only arise from events far outside the terrorism scenario—the detonation of a one megaton device high in the stratosphere.

An EMP would cripple both emergency communications and emergency response for an unknown period of time. Describing the likely impact on hospitals and other health facilities, one presenter observed: "If you're a medical professional, you're back to practicing medicine with a stethoscope and a mercury thermometer, not even a digital thermometer. You won't have power and you won't have instrumentation, until it's rebuilt. Medical personnel will have to use rudimentary 18th century-style medicine."

Panelists also confirmed that compared to a ground detonation, an air burst would deliver a greater portion of its energy as thermal energy, resulting in a much higher number of life-threatening burn injuries, a scenario for which the United States as a whole has minimal surge capacity and no clear path to increasing that capacity. Panelists considered the possibility that many burn victims would not receive any treatment.

4. Radiation Illness from Fallout May be More Preventable than Previously Thought

People can see fallout coming at them and seek shelter. The particles are readily visible, the size of a grain of salt or sand, and are too large to inhale. Although people cannot unknowingly be in the presence of fallout or inhale it, exposure to the invisible radiation that fallout particles emit is extremely dangerous, and taking shelter promptly is urgent. Panelists provided two essential findings about the fallout hazard.

First, fallout's radioactivity diminishes very quickly, i.e., within one half hour after particles have landed on a roof, sidewalk, car or other surface.

Second, buildings and other common urban structures provide shielding effects based upon their construction materials. Increased distance from exterior walls, roofs and other places where the fallout has landed also provides protection. Civil defense ratings for structures give approximate protection factors (some panelists considered these ratings conservative). A single story wood frame house may have a protection factor of only 2 or 3, while the basement of a multi-story office building may have a much greater protection factor of 200-300.

If all those who survived the initial blast could shelter in an underground parking lot, there would be no significant radiation exposure or illness among that population. But sheltering even in structures with much lower protection factors would radically reduce morbidity and mortality. Prolonged sheltering might not be necessary. Individuals could start to evacuate anywhere between 5 and 24 hours after the blast, depending upon the degree of protection provided by their sheltering facility, the location of the fallout plume and other health and safety hazards in the area.

Yet fear of radiation is a fundamental impediment to effective response.
Attendees discussed how lack of information and misinformation about radiation inhibit the public and emergency response personnel, and that there is a widespread attitude towards radiation that it is an "invisible death" that cannot be protected against. Survey data consistently show that radiation is the most feared and least understood hazard. Emergency responders report that they're less familiar or comfortable with radiation than any other hazard, and that they question their professional preparation for radiation risks.

Medical personnel must be better educated about radiation so that they will report for duty when needed, treat people requiring decontamination, be able to accurately assess and interpret radiation risks, and lead recovery and rescue efforts. If irradiated health facilities are to be reclaimed, medical personnel must be secure and confident of the physical plant safety in order to do their work and treat patients.

One participant characterized the readiness of local hospitals and emergency management departments to deal with radiation-related response issues as "less than full operational preparedness but considerably more than simply awareness." In the context of this discussion, panelists were informed of efforts in some localities to create radiological reserves corps, consisting of health physicists, radiation safety technicians and scientists with specialized radiation expertise. One participant noted that the Conference on Radiation Control Program Directors already has given a small number of grants for that purpose.

An attendee asked about how hospitals that are set up to decontaminate one or two people per day could be expected to scale up by many orders of magnitude in order to play their expected role in mass decontamination efforts. "How do we go from 1 to 1,000?" This prompted some discussion of whether decontamination is actually as complex and time-consuming a process as some believe, especially as radioactivity would decay quickly. One participant opined that removing one's clothes, shaking out one's hair and showering will amount to a "full decontamination." He added "I don't believe decon is going to be a significant issue for these patients." Psychologically though, medical staff would need to feel comfortable treating patients who have been exposed. Both education and radiation meters can greatly help reduce health provider's discomfort with decontamination activities.

5. Hospital surge capacity is insufficient to respond to an IND

Many participants agreed that current hospital surge capacity is nowhere near what would be necessary in this scenario. To make matters worse, in some cities, major hospitals and burn and trauma centers—the treatment resources most needed following an IND—are concentrated downtown, in the zone of presumed near-total destruction.

Many hospitals cannot afford to build much spare capacity into their systems. Like many other enterprises in a globalized economy, they hold small inventories of equipment and supplies on the expectation of getting daily "just in time" deliveries and having access to small surge capacity. Following an IND, limited on hand supplies, coupled with staff concerns about radiation safety and disrupted transportation networks and impassable highways, would vastly limit hospitals' ability to acquire the supplies and assemble the necessary workforce.

Participants discussed potential strategies for increasing regional surge capacity, such as building networks of cooperating hospitals and health facilities and involving and integrating the private medical system into the training and educational infrastructure for public hospital networks and emergency responders. One panelist, however, cited a preparedness exercise (unrelated to INDs) in which 130 hospitals were required to cooperate for just one day. "The system crashed," the presenter said bluntly. In practice, hospitals may partner with one or two other organizations, but they do not routinely engage with the large numbers that would be involved in this case.

Noting that following disasters, hospitals typically attract not only patients (and well people) seeking medical care, but also people seeking loved ones, reassurance, shelter or companionship, participants argued that after an IND event, people would overwhelm functioning hospitals, burden them with extraordinary security and public safety demands and make it impossible for them to provide tertiary care.

Hospitals often devote inadequate resources to security on the assumption that law enforcement will fill that role during a true emergency. In general, however, police departments have not prepared for that, and hospitals would need to undertake much more planning in order to be able to secure themselves by Day Three.

Participants discussed the general lack of protocols to test that the level of radiation in closed hospitals has dissipated, to certify that those facilities are once again safe for occupancy and to overcome significant fears of radiation among health care providers and patients alike. Some attendees noted the likely difficulties of moving large numbers of patients to remote hospitals and questioned the feasibility of mobile hospitals as a real, scalable resource.

Participants believed that large numbers of people would volunteer to assist in this kind of crisis, but that it would be an immense challenge to deploy—i.e., feed,

shelter, transport, train and equip—such an army of volunteers safely and effectively. Some participants noted that the potential reserve pool of medically trained volunteers is consistently overestimated due to double counting (for instance, one nurse might be counted as hospital staff, on the state registry, and as a Medical Reserve Corps resource).

6. Triage and Altered Standards of Care Must be Established Now

After an IND attack, large numbers of injured patients could present and overwhelm medical facilities. Many participants were concerned about effective methods to do triage within this mass trauma setting. Issues included how triage standards may have to change based on volume and types of injuries faced or based on available medical resources. Altered standards of care bring up legal, regulatory and ethical issues that have not been adequately addressed.

Estimates of triage outcomes in at least one major IND simulation placed nearly twenty percent more victims in the "expectant" category than in the "immediate" category. Depending upon the setting, either category could far exceed the most optimistic hospital bed surge capacity. This estimate highlighted the issue that upon an IND, treating expectant victims in hospitals could deny treatment to people whose lives can be saved with immediate care. Alternate settings such as low-tech, medium scale facilities would be needed to deliver palliative care and religious services for the "expectant" victims.

One participant, anticipating the on-the-fly enlistment of volunteers in relief efforts, strongly urged the adoption of altered standards of care and related legal protections. She said that when the disaster occurs, "the reality is that you're not going to have doctors and nurses, but the people who are there at the time. And so we need to have plans as to how we can use lay people to provide medical care." Another participant informed the conference that the Department of Health and Human Services recently has contracted with the Institute of Medicine to produce a study on this topic.

A panelist raised the issue of how extraordinary losses of capacity in the hospital system, coupled with extraordinary demands on functioning hospitals, would negatively affect outpatient healthcare such as nursing homes, dialysis units and same day surgery clinics, and also how such outpatient facilities potentially could contribute to IND surge requirements. This highlights an issue that largely went unaddressed: as all regional (and perhaps even national) medical resources instantaneously would become scarce following an IND detonation, the ethical issues in allocating those resources immediately would become urgent and require prompt resolution.

7. Planners Must Anticipate Spontaneous, Highly Disruptive Self-Evacuations

Based upon the experience of the 1979 Three Mile Island accident, in which virtually nobody stayed at the officially designated shelter, conference participants

agreed that upon an IND event, the vast majority of those who are able would attempt to evacuate the urban core, on their own and in their own vehicles, and would travel much farther than they actually need to. Therefore, official messages that counteract what appears to be a strong and pervasive "flight" instinct are critical.

Depending upon the city in which the attack occurred, communities up to 150 miles away would feel the impact of this mass displacement. Attendees observed a presentation of a map-based modeling tool that predicts community population surge following an urban disaster and gives surrounding communities more information on which to plan and prepare for an influx of evacuees. The tool considers a variety of factors such as road networks, number of hotel rooms and other resources that may make a particular peripheral community a potentially desirable destination.

Tens or hundreds of thousands of people fleeing the city center would drain food, water and gasoline from communities as they passed through or chose to shelter there. Participants focused on the need and opportunities for advance planning and collaboration between the urban center and the surrounding communities that might be at the receiving end of the evacuation. One noted that in the context of hurricane and pandemic planning, his municipality and several surrounding counties already had established teams to help identify and anticipate potential impacts of a mass movement out of the city.

A mass evacuation in personal cars most likely would compromise official plans for mobilizing responders, transporting patients and delivering state and federal supplies and equipment. Traffic congealment could completely shut down highway and road networks and block the exit and entry routes into the city center. Strategies for moving large numbers of patients to distant medical facilities must take this likely gridlock into account. Traffic congestion also could impede the movement of personnel and supplies into the crisis zone for re-supply efforts. A panelist called Day 3 "the re-load" period for both personnel and supplies, since the first responders would need respite and many on-hand supplies would have run-out.

During a discussion of alternatives to surface evacuation of patients, a participant asked for clarification of the rate at which the military and National Guard could evacuate patients by air. One panelist noted that the number of patients per day would vary based upon the nature and severity of the patients' illnesses and injuries, how far the patients needed to be transported and whether or not there was interstate or international movement. One other consideration, which initially took some participants by surprise, would be whether or not it was considered acceptable to have any patients expire in transit. For some, this was an unexpected and unfamiliar reappearance of the altered standards of care issue.

8. Intra-Regional and Federal-Regional Integration Is Still Badly Lacking, Not Well understood by Emergency Planners

There was significant difference of opinion among conference participants as to whether adequate regional planning had taken place on the federal, regional or local level. At one extreme, some felt that virtually no planning had taken place. At the other, people argued that extensive planning already has led to the creation of adequate systems and structures. There was concern that local and regional agencies rely too heavily on the federal government and may have a false sense of security that the federal government immediately would come to the rescue. There was consensus that local governments need to accept their role in an IND response and plan for 1) sheltering in place, 2) evacuation, 3) assessing their own capabilities and resources, and 4) management and support. One participant speculated that "local health departments will probably be stumbling because they have not accepted their role in response to a nuclear detonation."

An important topic related to regional decision-making is how the state government and regional actors would interact with federal agencies in order to determine where to deploy and how to deliver federally-provided relief and response assets. Participants agreed that high level state officials would lead this process. However, even the states that have devoted substantial efforts to this question may have answered it only in part. The specific state and federal staff who will make those decisions know each other, know where they all are located and know their respective roles in the process. Furthermore, some states have put in place mechanisms to quickly mobilize trucks to pick up federal assets delivered to state airports. But detailed decision rules and processes for actual logistics decisions are not yet in place. Opinions also varied considerably as to whether unified command would be necessary or possible following an IND attack.

9. Local, State and Regional Agencies Must be Able to Lead Response

Panelists noted that the "movie version" of the federal government swooping in to take control and commandeer the regional response effort is grossly inaccurate. Local first responders will be first people at the scene and the last people to leave. As part of a "tiered response," in which state and federal resources are brought to bear only when local governments request assistance, the federal government always would act in a support role, not a leadership role. The Department of Defense, in particular, would be the last agency in and the first agency out. Some participants questioned how this reactive federal posture would deal with a leadership vacuum at the state and/or local level.

It was noted that during an actual disaster response the process is not necessarily sequential. Requests, authorizations and allocations often occur in "parallel processes," and are repeated again and again as needs arise. Federal agencies that would play a major role in response efforts—DHS, HHS, DOD—require very specific, needs-driven requests from its state and local interlocutors, rather than

open-ended, imprecise requests to send supplies and equipment. Additionally, on Day 3, the White House, the media and the general public all would be "numbers hungry" to gauge the magnitude of the disaster and ground the disaster in existing federal policies and laws. Panelists indicated that the federal government is aware that satisfying procedural and information requirements is a burden on local, state and regional government at the moment of maximum stress and most constrained resources, and will work with those governments to put in place arrangements before disasters occur.

10. Once the Federal Government Decides What, When and to Whom, It Can Deliver Supplies and Personnel Quickly. But it Could Not Make Those Decisions Quickly Following an IND.

One panelist reported that transportation planning and coordination had improved greatly in recent years. There are now established systems that can get supplies and medical teams to a disaster site in 12 or 24 hours, respectively. But it can take much longer than that to make the decision to send equipment or people somewhere. The United States has little experience with no warning, catastrophic events and the federal response systems are better attuned to situations (such as hurricanes) where agencies may have five or six days notice to mobilize and prepare. The recent experience in Haiti demonstrated how hard it is for the federal government to get adequate situational awareness of a sudden complex disaster, to make decisions about deploying limited resources and to ramp up relief efforts quickly.

11. Communications and Messaging Are Critical but Underdeveloped

A cross-cutting topic was the paramount importance of public behavior and responses to official communications in determining the effectiveness of any regional response to an IND. Generally, participants believed that communications and information would have a profound effect on public reactions and responses. In one participant's words, "Public information issues, communication, messaging really need to be at the very heart of planning, preparedness and response to a nuclear detonation event."

Incomprehension of terms such as "shelter in place" and "informed evacuation" would limit public compliance with official directives. Participants suggested that well-crafted, positive "do this" messages are more effective in eliciting the desired response than "don't do that" messages, that the general public (and especially minority communities) is quite fatalistic about nuclear terrorism and that planners and officials must weaken such fatalism in order to make people more likely to undertake the protective actions.

Participants repeatedly emphasized the importance of preparing for effective communications by practicing, and by cultivating long-standing relationships and partnerships with community and religious organizations. They also reiterated the importance of *not* sending inaccurate, confusing or panicked messages. As one conference participant phrased it, "your main resources are confidence and time but

both of these are wasting resources, they erode on you."

There was some consensus that federal and state government risk messaging are inconsistent and uncoordinated, for instance, conflicting advice on whether it is best to shelter immediately or evacuate immediately. Participants discussed the desirability of state and local officials knowing in advance the content and sequence of high level emergency messages that would emanate from the federal government, and whether such messages would come from the President, the Secretary of Homeland Security or other officials.

Citizen preparedness is a key issue, but effective strategies have been elusive. Public education about risks and hazards would seem to be the ideal solution, but experience shows that education campaigns are ineffective if people aren't receptive to the information. To further this concept one participant acknowledged, " People are going to make decision contrary to what we want them to do if we're not working with them in advance…." Furthermore, "the people who have the messages to deliver need to understand what the communication infrastructure looks like." This poses a special challenge for a topic that very few people are willing to discuss, let alone prepare for in a substantial way.

Resources and Starting Points

Some resources and starting points were suggested by participants:

Publications:

- Planning Guide for Response to a Nuclear Detonation, 2009 (www.hps.org/hsc)
- Key Response Planning Factors in the Aftermath of Nuclear Terrorism, 2009 (www.hps.org/hsc)
- Rural Preparedness Planning Guide (NORC, walshcenter.norc.org)
- FEMA's National Fallout Shelter List, last updated in 1992. Despite its publication date, many buildings on the list would still be available for use.

Federal or Regional Coordinating Agencies

- Metropolitan Medical Response Systems (MMRS) There are 125 MMRS programs that cover approximately 70% of the population.
- MDMS This HHS division has 10 regional offices.
- NYC Office of Emergency Management (OEM) Regional Liaison Team

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About the National Center for Disaster Preparedness

Founded in 2003, the National Center for Disaster Preparedness (NCDP) is an academically-based resource center dedicated to the study, analysis and enhancement of the nation's ability to prepare for, respond to, and recover from major disasters, including terrorism. The NCDP has a wide-ranging research, training and education, and advocacy agenda, with a special interest in megadisasters. NCDP senior staff and faculty have testified at Congressional hearings, conducted briefings for senior government officials, and have presented at numerous scientific conferences and meetings.

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