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Bioterrorism: Summary of a CRS/National Health Policy Forum Seminar on Federal, State, and Local Public Health Preparedness

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Summary

The September 11th attack and subsequent intentional release of anthrax spores via the U.S. postal system have focused policymakers' attention on the preparedness and response capability of the nation's public health system. The anthrax attacks put a tremendous strain on the U. S. public health infrastructure, an infrastructure that many experts argue has been weakened by years of neglect and under-funding. To better understand the preparedness gaps that exist, as well as the disparate functions and agencies that define public health in this country, the Congressional Research Service (CRS), in conjunction with George Washington University's National Health Policy Forum (NHPF), convened a seminar on October 26, 2001, entitled, *The U.S. Health Care System: Are State and Local Officials Prepared for Bioterrorism? How Should the Federal Government Assist?* This report was supported, in part, by a grant from the Robert Wood Johnson Foundation.

Speakers included William L. Roper, M.D., M.P.H., Dean, School of Public Health at the University of North Carolina; Georges C. Benjamin, M.D., Secretary, Maryland Department of Health and Mental Hygiene; Amy Smithson, Ph.D., Director, Chemical and Biological Weapons Non-Proliferation Project, the Henry L. Stimson Center; and Janet Heinrich, Dr. P.H., R.N., Director, Health Care–Public Health, U.S. General Accounting Office. The panelists presented a detailed overview of public health and the difficult choices the country faces in preparedness planning and rebuilding. The speakers made clear in their remarks that while immediate needs must be met, the importance of planning for the longer-term must not be overlooked. They suggested the need to recognize the multitude of returns on initial investments in public health. For example, if some drug-resistant bacteria were to emerge, independent of any terrorist activity, the capabilities developed to combat bioterrorism would be invaluable.

Based upon their varied experiences, there was general consensus among all the speakers that public health preparedness, while dependent upon federal financial and other assistance, was largely a local matter. They argued that mending the gaps in the current public health fabric will require significant long-term commitments from the federal government, including investments and improvements in: laboratory capacity, regional planning, workforce training, epidemiology and surveillance systems, information systems, communication systems, and media relations.

The panelists stressed that as priorities are set and resources committed, it is imperative that all preparedness efforts be coordinated at all levels of government—federal, state, and local.

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Introduction

The anthrax events that have occurred in the wake of the September 11th terrorist attacks (see box on p. 2) have triggered a heightened state of alert and a series of questions related to the ability of the United States public health system to adequately meet the challenges associated with anthrax as well as smallpox, plague and other possible bioterror threat agents. In response to these questions and concerns, CRS, in conjunction with George Washington University's National Health Policy Forum, sought to provide a forum for congressional staff to hear from leading experts in the field.¹ Speakers for the session included: William L. Roper, M.D., M.P.H., Dean, School of Public Health at the University of North Carolina; Georges C. Benjamin, M.D., Secretary, Maryland Department of Health and Mental Hygiene; Amy Smithson, Ph.D., Director, Chemical and Biological Weapons Non-Proliferation Project, the Henry L. Stimson Center; and Janet Heinrich, Dr. P.H., R.N., Director, Health Care–Public Health, U.S. General Accounting Office.

Over the years, experts have been calling for a more robust public health infrastructure,² for a closer working relationship between the medical and public health communities, and for a broader research and development agenda in this area. Preparing for attacks that might take a number of very different forms has taken on greater urgency since September 11th. Priorities have shifted, and the importance of the public health and safety infrastructure has become a much greater concern.

¹Originally conceptualized as two separate sessions, the first one focusing on the federal role in preparedness and the second on the state and local response capabilities, the meeting that ultimately took place was collapsed into one session due to the Capitol Hill closures associated with the anthrax contamination. When the meeting was finally held, it addressed both the federal as well as the state and local perspectives.

²The seminal 1988 Institute of Medicine (IOM) report, *The Future of Public Health* (Washington, DC: National Academy Press), identified three prongs that define public health and its infrastructure: (1) The Mission of Public Health: the fulfillment of society's interest in assuring the conditions in which people can be healthy [p. 40]; (2) The Substance of Public Health: organized community efforts aimed at the prevention of disease and promotion of health. It links many disciplines and rests upon the scientific core of epidemiology [p. 41]; and (3) The Organizational Framework of Public Health: encompasses both activities undertaken within the formal structure of government and the associated efforts of private and voluntary organizations and individuals [p. 42].

U.S. Anthrax Attacks

Twenty-two cases of anthrax have occurred as a result of the intentional dissemination of *Bacillus anthracis* spores through the U.S. postal system: 11 cases of inhalation anthrax and 11 cases (seven confirmed and four suspected) of cutaneous anthrax. Five of those with inhalation anthrax have died. The remaining 17 patients are expected to make a full recovery. The majority of cases occurred in persons working at postal facilities in New Jersey and Washington, DC, where contaminated letters were handled or processed by high-speed sorting machines, or at media companies in New York City or Florida, where the letters were delivered. At least 300 postal and other facilities have been tested for the presence of *B. anthracis* spores, and more than 32,000 potentially exposed persons have been given antibiotics.

Federal officials have confirmed that the bacterial spores used in the recent attacks in Florida, New York, and Washington, DC belong to the Ames strain, a variant of the anthrax bacterium that has been produced and studied for decades by the U.S. Army's biological weapons program. Although the Ames strain is highly virulent (i.e., effective at causing disease), it is also sensitive to a range of antibiotics. Officials have reported that the spores sent to Capitol Hill were processed into a highly concentrated and very fine, dry powder. In this form, the tiny spores, each about 1-3 microns in diameter, readily aerosolize and are capable of being inhaled deep into a person's lungs where they can trigger the most serious, inhalational-form of the disease.

Though the recent anthrax attacks are small in scale compared to the scenarios envisioned by bioterrorism experts and played out in recent government exercises (e.g., Deep Winter), they have exposed weaknesses in the public health system and shown that it is ill-prepared to deal with a large-scale bioterrorist attack.

The existence of significant gaps in the country's emergency preparedness was made clear by the speakers. Examples of the inadequacies in the public health system that emerged during the anthrax crisis included: the lack of laboratory capacity and the rapidity with which they became overwhelmed, the problems in communicating accurate information to the public, the lack of coordination and timely information exchange among the various components of the health care system, and the lack of coordination and seamless integration between public health, public safety, law enforcement, and the media. The clash of cultures – particularly around information sharing – between law enforcement (keeping information under wraps for security purposes) and public health investigations (broadly disseminating information in order to contain epidemics) was cited as having the potential to undermine the integrity and the ability of public health to accomplish its goals.

The speakers provided an overview of the current state of emergency preparedness at all levels of government, by identifying both the gaps that exist and the steps being taken to close them. A recurring theme underscored by all the presenters throughout the seminar was that closing the preparedness gaps by shoring up the public health system will help protect against the growing threat both from natural events – increasing because of global travel, ubiquitous imported food, and antibiotic resistant pathogens – as well as intentional attacks.

Key among the discussions was how to design the best preparedness “game plan.” The speakers believe the plan should be: one that is well coordinated among all levels of governments and among all the various players; one that spends dollars wisely and efficiently without duplicating efforts already underway; one that depoliticizes public health and one that understands that public health is a local need dependent upon federal dollars; one that recognizes both the short and long-term needs and the fact that rural areas have even less capacity than suburban or urban areas; one that is given immediate priority.

Public Health Preparedness: This One Is For Real

For many years, issues pertaining to public health have seldom been given priority attention. This changed with the first case of inhalation anthrax in Florida in early October. That first case of anthrax, the index case in public health parlance, propelled the public health system into the spotlight and commanded the attention of the entire nation. Public health, explained Dr. William L. Roper,³ is all about protecting the public against threats to their health. At the time this seminar was held, public health had become front-page news, headline information on the 24-hour news shows. But the U.S. public health infrastructure, after years of languishing was described as fragile, thin, and in need of repair. According to Dr. Roper, the nation directs most of its health resources towards medical care (e.g., physicians, hospitals) and biomedical research. The public health system receives only “crumbs,” as compared to other components of the health care system.

He believes the longstanding problem of the lack of attention to and under-investment in public health has been compounded by recent events, including pressures brought on by the current economic slowdown and state budget shortfalls. At the same time, the public health system faces increased demands and heightened expectations in the wake of September 11 and the anthrax attacks.

According to Dr. Roper, the public’s expectations, not surprisingly, called for 100% protection with no risks. The goal of public health is to minimize health risks. This was a particularly challenging aspect of the anthrax events because of the unfamiliarity of the disease among medical professionals. While the science was evolving on an almost daily basis, the learning curve was steep, and public health officials and personnel – at the federal, state, and local levels – were working around the clock to try to contain the anthrax outbreaks and ease the public’s fear. Dr. Roper cautioned against carping about and criticizing the Centers for Disease Control and Prevention (CDC), the lead public health agency at the federal level, and other health officials as they made their way through the nation’s first major bioterror attack. While he praised the dedication of all involved, Dr. Roper voiced his concern over the inevitable emotional and physical burn-out that would ultimately occur among the front-line workers. Adding to the growing list of challenges, Dr. Roper asserted that not only would workers grow weary, but supplies of protective clothing and other gear could be depleted, further endangering health officials and first responders.

³William L. Roper, M.D., Ph.D., is Dean of the School of Public Health at the University of North Carolina. He was director of CDC from 1990–1993.

In order to meet the current public health challenges and to be better prepared for future events (which include both deliberate and naturally occurring public health threats), Dr. Roper stressed the importance of continuing the efforts already underway. Building upon existing training programs⁴ (such as the Public Health Grand Rounds and the Public Health Training Network), improving existing communication systems, and strengthening existing information systems (such as the Health Alert Network⁵) will ultimately upgrade the public health system and infuse it with the resources, tools, and personnel that will be necessary to protect the public now and in the long-term.

Public Health Preparedness: One State's (Maryland) Experience

Dr. Georges C. Benjamin⁶ opened his presentation by reviewing the various types of public health concerns (organisms causing morbidity and organisms causing mortality) and the various ways in which these organisms could present, including natural events, overt events, covert events, high-risk events such as the Olympics or a presidential inaugural, and police actions that discover a risky site (e.g., finding a bioterror lab during a routine drug bust). The challenge facing public health officials is knowing when an attack has occurred, particularly in a bioterror scenario which can take days or even weeks to become obvious.

The key to preparing for such an event is surveillance – finding unprecedented numbers of cases or unusual circumstances, signs that raise the index of suspicion. The impact of surveillance on survivability is huge; Dr. Benjamin cited studies conducted by researchers at the Johns Hopkins University confirming that early warning systems save lives.

Early warning systems are one of many components necessary for successful preparedness. Disasters, Dr. Benjamin maintained, overwhelm health care systems that are already stretched thin. “One of our objectives is to shorten the time from absolute chaos to controlled disorder.” Maryland has taken the following steps to better prepare for public health events, whether a naturally occurring outbreak or the result of a covert release of a dangerous pathogen.⁷ These activities include:

⁴For additional information, go to the University of North Carolina’s School of Public Health Web site, [<http://www.sph.unc.edu>] and click on “bioterrorism.”

⁵A nationwide program, developed by the CDC in partnership with the National Association of County and City Health Officials, the Association of State and Territorial Health Officials, and other health organizations, to establish the communications, information, distance-learning, and organizational infrastructure that will link local health departments to one another and to other relevant organizations.

⁶Georges Benjamin, M.D., is Maryland’s Secretary of Health and Mental Hygiene.

⁷For additional information, go to Maryland’s Dept. of Health and Mental Hygiene Web site [<http://www.dhmh.state.md.us>].

- advance planning;
- ongoing surveillance and pre-incident intelligence gathering;
- establishing a predetermined chain of command and authority (medical personnel are not comfortable working in command and controlled environments);
- building relationships with law enforcement personnel (“have lunch with your FBI agent”);
- establishing rapid, broad communication capabilities (that can identify sentinel events and enhance communications); and
- training personnel (public health staff, laboratory staff, medical providers, medical examiners, as well as mail room and office staff).

In order to minimize the chaos associated with a public health crisis, Dr. Benjamin noted that his priorities included the development of policies concerning decontamination of people and facilities, prophylaxis and vaccination, quarantining and isolation, and the monitoring of rescue workers. Other issues that Dr. Benjamin has planned for in order to minimize confusion during a public health crisis include: capacity building (planning for surge capacity – a sudden, often unexpected increase in service demand – among hospitals and nursing homes), preauthorization for payment (linking to managed care and other payers), community mental health needs, pest and rodent control, waste control, mortuary needs, disease follow-up, and access to vital health records.

Preparedness funding priorities for the state of Maryland center around increasing laboratory capacity (in terms of resources and personnel), strengthening communication and information systems, as well as improving training and education programs for health care workers, the public, and the media. These state set priorities mirror those articulated by Dr. Roper in his remarks. The call for better coordination, better planning, better training, as well as a greater investment in and commitment to those agencies that make up the vast network known as public health was the major theme of all four speakers.

Public Health Preparedness: Lessons From The Field

Dr. Amy Smithson⁸ drew on the research and findings from her Henry L. Stimson Center Report #35, *Ataxia: The Chemical and Biological Terrorism Threat and the U.S. Response*⁹ which contained information based on the combined wisdom of front line operatives interviewed in 33 cities across the country. According to Dr. Smithson’s research, most cities reported being better prepared to handle a chemical, rather than a biologic attack because cities have a sizeable number of HAZMAT (hazardous materials) teams as compared with the necessary resources that would be needed to handle a bioterror incident.

⁸Amy Smithson, Ph.D., is Director of the Chemical and Biological Weapons Non-Proliferation Project at the Henry L. Stimson Center, Washington, DC.

⁹For a full copy of the report, go to [<http://www.stimson.org/cwc/ataxia.htm>].

Although all those surveyed indicated an uneasiness in the level of preparedness on the “medical side of the house” for both chemical and biologic attacks, the primary concern repeatedly raised by the experts was the ability – or inability – of the cities’ public health officials to be able to figure out something was wrong and to isolate the responsible organism quickly enough to be able to contain an outbreak and successfully treat the victims of such an attack.

According to experts interviewed by Dr. Smithson, disease reporting is the first critical step in determining a suspicious cluster of events. Dr. Smithson noted that the current system is reliant upon physicians who are “only human” and given the new awareness of bioterror threats, are going to be asked to identify diseases they have never seen before.

In trying to overcome this obvious hurdle, New York City (NYC) has broken new ground by monitoring all of its emergency services calls (911 calls). Analysts have developed software that can identify disease markers or sentinel events, flagging unusual outbreaks of diseases, for example during unusual seasons. If for instance, a cluster of flu-like cases were to occur during a non-peak flu season time period, this would trigger a red flag that public health officials could investigate. It is the equivalent of a digital early warning system. Over-the-counter drug products are also monitored in New York City, again to spot unusual purchasing patterns during atypical seasons. This effort requires that the resources and capacity to harness and crunch the data are available at the local level. Similarly, New York City has also selected sentinel hospitals that are *always* on alert, always looking for the exotic disease first (an approach not typically utilized in classic diagnostic work-ups). All of these initiatives allow New York City to take the pulse of the system on a continuous basis.

Once an unusual situation is uncovered, notices can be sent out to other hospitals, laboratories, and medical personnel alerting them to a potential outbreak while at the same time seeking additional input from the field. This system is useful not just for covert criminal attacks, but is also vitally important in containing naturally occurring public health disasters such as influenza outbreaks and food-borne related illnesses. This is particularly critical given the global nature of the world today and its effect on the spread of disease.

The New York City surveillance system is unfortunately the exception and not the rule. Dr. Smithson stressed that this level of sophistication is desperately needed across the country. But, this alone is not sufficient. Dr. Smithson noted that a second tool that must be used in tandem with a sophisticated early warning surveillance system involves what a physicist at Sandia National Labs has developed. This tool is in many ways a mirror-image of the NYC system in that the capability to access data from a central data bank is placed directly in the hands of the physicians. If a patient or group of patients present with suspicious symptoms, the doctor can type data (e.g., from diagnostic tests) directly into a hand held device and retrieve information from a central data repository. Together, according to Dr. Smithson, these two tools – which would provide a rolling temporal and diagnostic map in the physician’s geographic area – would arm the front line medical professionals, potentially providing enough time to jumpstart a prophylaxis program that could save lives. The science and technology exist today to implement these capabilities. Up until very

recently, however, the resources and commitment were lacking. Dr. Smithson believes that the window of opportunity to put these programs in place has never been greater.

Another largely ignored but critical component of emergency preparedness that must be improved upon is regional hospital planning. Again, according to Dr. Smithson's research, bona fide regional planning where regular disaster drills are practiced is the exception rather than the rule. During her interviews with hospital administrators, Dr. Smithson learned that the inability to charge medical personnel time to a reimbursable health service largely explained the lack of regular disaster planning and drills. Given the financial disincentives associated with these planning efforts, coupled with the relatively low level threat potential (until recently), it was not surprising that these efforts were deemed low priorities. Respondents said that most plans were drawn up using medical personnel who volunteered their time. Dr. Smithson pointed out, however, that most health professionals volunteering their time tend to work with the uninsured.

Dr. Smithson stressed that in the absence of these regional "game plans," entire local health care systems could collapse. These plans must allow for the maintenance of maternity wards, burn and trauma centers, and critical care units, services which will continue to be in demand regardless of whether a bioterror or other public health crisis ensues. Likewise, the plan must insure an adequate level of supplies (i.e., not assuming that there will be sufficient suppliers for all hospitals but actually conducting the research and mapping out the logistics of which hospital will receive what quantity of which specific supplies.) Other considerations pointed out by Dr. Smithson that warrant attention include figuring out, ahead of a crisis, precisely how the national stockpile of prescription drugs and other medical supplies will be distributed. (This aspect of planning would necessitate the provision of security in the case of mass panic.) In addition, there must be a regional plan regarding prophylaxis strategies; deciding for example, who gets vaccinated when. Another dimension requires local regions to define what assistance they can expect from the federal government, how long it will take until it arrives, and what it will take to fill the gaps until federal assistance arrives. Dr. Smithson strongly stated the opinion that while table-top exercises such as *Dark Winter* are important, they do not go nearly far enough and that it is imperative that real drills be practiced on a regular basis.¹⁰

Dr. Smithson made a plea to the audience that any preparedness package include adequate, well coordinated state and local public health and front line preparedness capacity building. She stressed that this does not necessarily mean more money, but money spent more wisely. She then raised the question of the role of the federal government.

¹⁰Dark Winter was an exercise designed to simulate possible U.S. reaction to the deliberate introduction of smallpox in 3 states during the winter of 2002. The exercise itself was conducted at Andrews Air Force Base on June 22–23, 2001. Former senior government officials played the roles of National Security Council members responding to the evolving epidemic. For more information on Dark Winter, go to [<http://www.hopkins-biodefense.org>].

Public Health Preparedness: The Federal Role

Dr. Janet Heinrich¹¹ summarized the recent findings of a September 28, 2001 U.S. GAO study she directed, *Bioterrorism: Federal Research and Preparedness Activities*,¹² which found that over 20 federal agencies have a role in emergency preparedness. While the role and responsibilities of these agencies cut a wide swath, from detection of disease to the provision of vaccines, from research and development to prevention, coordination at the federal level is severely fragmented. While there are many efforts to coordinate these activities, the outlook so far, according to Dr. Heinrich, is bleak.

Pointing to the vast increase in dollars allocated to preparedness efforts (a 310% increase since FY1998) Dr. Heinrich stressed the need to establish priority spending for these monies. Her call, which was echoed by all those on the panel, was to include training, communication and information systems enhancement, and capacity building at the top of the priority list. Another important aspect of priority setting involves getting the money from the federal purse into the state and local coffers where it is needed most, in other words, deciding which priorities should be funded with federal dollars. The question was raised whether directing federal preparedness money to vaccines and prescription drug stockpiles was the most judicious use of these funds given that state and local public health entities do not rate these items high on their priority lists. GAO found that vaccine and drug stockpiles are seen by many public health officials in the trenches as a short-term “band-aid” fix for a limited number of biologic threats, and not the crucial longer-term commitment needed to shore up the thinly stretched basic public health infrastructure of today. It was pointed out that one key contribution the new office of homeland security could make would be to assist in coordinating the transfer of federal dollars to local level needs.

Questions From The Audience

Questions from the audience covered several themes, most of which revolved around the division of labor and responsibility among the federal, state, and local governments. One audience member questioned whether today’s decentralized public health system is the most appropriate structure for fighting the war on terrorism. It was pointed out that the recent terror attacks were really national attacks, akin in many ways to the attack on Pearl Harbor (in which a national response ensued). The consensus among the panelists was that these issues are local and that a national superstructure would ultimately create a false sense of security and would undermine the ability of an already fractured local public health system to rebuild. The panelists were of the strong opinion that this is *the* opportunity for shoring up and bolstering a permanent state and local capacity and that there was a definite role for the federal

¹¹Janet Heinrich, Dr.P.H., R.N., is Director of Health Care and Public Health issues at the U.S. General Accounting Office.

¹²A copy of the report in its entirety can be found by going to the GAO Web site [<http://www.gao.gov>], clicking on “Find GAO Reports” and entering report number “GAO-01-915.”

government, one that was not solely centered on finances. An example cited was that while the CDC is only one component of the U.S. public health enterprise, it is a vital resource to state and local officials. If, however, experts at the CDC are prohibited from sharing information, the integrity and the ability of the entire public health infrastructure could be at stake. So too might be the health of the public.

Another area that received attention from the audience involved states' capacities to effectively use additional funds that would make their way from the federal coffers into state and local budgets. Concern was expressed among many in the audience that there be adequate accountability as to how the new federal dollars would be spent in the name of bioterror and emergency preparedness. Monies should not be diverted to oncology wards, for example, at the expense of decontamination units.

The issue of incorporating professional standards for front line and medical personnel into education programs was raised in a related round of questions and answers. The panel agreed that where the power of Washington could be brought to bear was in institutionalizing professional standards into existing programs that could be modified to incorporate bioterrorism training. They said it would not be enough for the federal government to dictate exactly how to conduct a particular preparedness related activity. Rather, the states should be given maximum flexibility and control, but at the same time, they must be held accountable.

There seemed to be agreement that while most of the day to day action would continue to take place at the state and local levels, there were several important ways the federal government could enhance preparedness (e.g., financing and conducting technical research and development, financing and maintaining the national pharmaceutical stockpile and coordinating and sharing clinical expertise through the CDC). But to be successful, such commitment must not waver when the anthrax crisis comes to a close. An example of "yo-yo public health funding" commitments cited was the U.S. experience with tuberculosis (TB). When the country faced a serious TB epidemic, monies were provided with the express purpose of ridding the country of TB. But as soon as TB was largely eradicated, the monies were cut. The lack of public health funds for education and prevention contributed to the return of TB, only this time it came back in an antibiotic-resistant form. More monies had to be infused into the system, and eradicating antibiotic-resistant TB remains a public health challenge. The message from the speakers was clear: fighting disease – whether naturally occurring or manmade – will require a consistent, coordinated, long-term commitment.

Conclusion

The distinction between bioterrorism and chemical terrorism, as well as that between radiologic and nuclear terrorism, is critical, for in the differences between them lie the unique requirements for preparedness. While many of the issues and challenges are the same, regardless of the type of terror attack (for example, the ability of the health care system to deal with mass casualties and the "worried well," short and long-term mental health needs, and panic), the nature of an attack will determine the needed response and ultimately the level of preparedness. In the end,

while the initial responses may start out differently, all emergency responses ultimately rely on the same health and safety infrastructure. An infrastructure which has fallen into a critical state of disrepair after years of neglect and budget cuts, according to the speakers at the seminar. As federal and state lawmakers debate and devise strategies for becoming better prepared, there was consensus among all the panelists that whatever form the final plans take, they should be well coordinated, well funded, and long-term.