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Responding to Bio-Terrorism Requires a Concerted Effort

by Mohamed Athher Mughal

A homeland defense unit at the U.S. Army Soldier and Biological Chemical Command is working with civilian first-responders to improve the nation's capabilities against chemical and biological terrorist attacks.

Under a project called the Military Improved Response Program (MIRP), SBCCOM partnered with and provided civilian first responders and emergency managers practical solutions to improve their preparedness in cases of biological and chemical terrorism. The program's successes underscore how Army scientists and engineers can partner with federal agencies such as the FBI, Federal Emergency Management Agency, Department of Health and Human Services, Environmental Protection Agency and Department of Agriculture.

The MIRP was designed to leverage SBCCOM's science and technology efforts to help first-responders manage the consequences of a chemical or biological event and improve the response capability of Defense Department organizations that provide military support to civilian authorities.

Four functional groups participate in the MIRP effort: health and medical; fire and hazmat; law enforcement and fatality management.

The health and medical group is working to improve the response capabilities against biological warfare by designing a set of alternative medical facilities. These facilities comprise the Modular Emergency Medical System (MEMS), a strategy for flexible expansion of a local medical infrastructure to accommodate large numbers of patients.

The fire and hazmat group is developing recommendations for firefighters and hazmat crews responding to chemical or biological terrorist incidents. This group also performs equipment testing to support fire and hazmat operations.

The law enforcement group is defining the role and conduct of criminal investigations for biological and chemical terrorism. The fatality management group is partnering with the civilian medical examiner and public health communities to determine how military resources can best support the management of mass fatalities resulting from a biological or chemical incident. They are also working with military mortuary affairs organizations to help develop a commander's guide for mass fatality management.

The MIRP's origins date back to fiscal year 1997, when the 104th Congress passed Public Law 104-201. Title XIV—Defense Against Weapons of Mass Destruction—provided for preparedness training against weapons of mass destruction for

civilian first responders. Section 1415 of Title XIV stated, “The Secretary of Defense shall develop and carry out a program for testing and improving the responses of Federal, State and local agencies to emergencies involving biological and chemical weapons and related materials.”

As a result of this legislation and in support of the Defense Department, SBCCOM established the improved response program (IRP). In October 2000, the civilian portion of the IRP was transitioned to the Department of Justice’s Office of State and Local Domestic Preparedness Support. SBCCOM continues to retain a military IRP (MIRP) as part of its new homeland defense business unit.

Prior to the DOJ transition, the IRP conducted numerous analyses designed to identify and demonstrate the best practical approaches to improve the nation’s preparedness for biological and chemical terrorism. The IRP was a multiyear analytical program designed to enhance the preparedness of civilian emergency responders and managers. As such, the IRP maintained a partnership between military experts and civilian responders and emergency managers at the federal, state and local levels. Civilian participants specialized in emergency management, law enforcement, firefighting, emergency medical services, hazardous materials and public health.

The IRP identified, prioritized and developed solutions to the most pressing response issues associated with domestic chemical and biological terrorism.

Medical Consequences

One of the most significant differences between chemical and biological events is the way that medical consequences will unfold over time. The Centers for Disease Control and Prevention’s (CDC) Strategic Plan for Preparedness and Response to Biological and Chemical Terrorism notes that the medical casualties of chemical terrorism will usually be immediate and obvious. Alternatively, biological terrorism will not have an immediate impact because of the delay between exposure and onset of illness.

Because of these time differences in effects, chemical terrorism will usually have an identifiable incident scene while biological terrorism will not. The casualties of chemical terrorism will be readily observable whereas the casualties of biological terrorism may not even know that they are infected until many days after initial exposure.

These significant differences between the consequences of chemical and biological terrorism require that different disciplines of first-responders be engaged in managing the consequences of each kind of incident. Chemical terrorism will likely engage firefighters, law enforcement personnel and emergency medical services converging at an incident scene. Biological terrorism will likely engage public health officials, nurses, physicians and other medical providers treating patients at hospitals and clinics days after the initial event.

The primary consequence of a large-scale bioterrorist attack will be a catastrophically large number of medical casualties. Response systems must be capable of providing the appropriate types and amounts of medical treatments and services. However, the full spectrum of potential consequences is much broader than medical casualties.

A well-conducted bio-terrorist attack will strain the U.S. public health medical surveillance systems. It will also require responders to make quick, accurate medical diagnoses and disease identifications. By definition, a bio-terrorist event is a criminal act that will require a complex criminal investigation. Depending on the agent used in an attack, such an incident could also result in residual environmental hazards that would require mitigation. Considering the potential magnitude of casualties, a significant portion of a metropolitan area's population may have to be medically managed and physically controlled.

The medical treatment, criminal investigation, environmental hazard mitigation, and population control activities will require a coordinated command and control effort extending across federal, state and local jurisdictions.

The biological weapons IRP team identified a myriad of emergency functions necessary for bio-response. To be useful and understandable, these multiple activities needed to be organized into a logical and integrated response system. Thus, the IRP team formulated a generic bioresponse template. The template organizes and integrates the essential emergency response functions necessary for a city to respond effectively to a bioterrorist incident. This generic template serves as a useful starting point for cities and states to prepare their own customized local emergency plans.

Medical surveillance, the first component of the template, should operate continuously to improve the chances of quickly detecting unusual medical events in the local population. Once an anomaly is detected, medical diagnosis is necessary to identify and confirm its cause. Rapid and accurate disease identification is essential to initiate appropriate and timely medical treatments for many bio-warfare agents. Once a disease is identified, the public health community will likely begin an epidemiological investigation to determine the distribution of cases and the sources of the disease outbreak. This information is necessary to control disease propagation and to identify and treat the population at risk.

Concurrent with these medical investigations, the law enforcement community will begin a criminal investigation to assess the threat, safeguard evidence, and identify and apprehend suspects. While the criminal investigation is in process, and pending the specific disease agent, local officials may begin a mass prophylaxis campaign to prevent disease and death in exposed victims. Federal and state assistance most likely would be needed to support local response planning for mass prophylaxis.

Depending on the attack agent, residual hazard assessment and mitigation may be necessary to assess and protect the population from further exposure to potential environmental hazards. In the case of a contagious disease, physical control of the affected population may be necessary to control and minimize secondary infections. Quick dissemination of accurate, authoritative medical information is essential to maintain this kind of control.

The local medical infrastructure's patient capacity will have to be rapidly expanded to accommodate the high volume of patients. Alternative health care centers will have to be established within the affected area. Due to resource constraints, victims will likely have to accept sub-traditional levels of care. Appropriate fatality management strategies will have to be put into place to manage the potentially large number of fatalities. The local community will need to stand-up family support services to provide information, non-medical assistance and crisis counseling to victims and their families.

For an effective response to bio-terrorism, the described emergency functions will need to happen at a rapid pace and in high volume, all while insuring continuous operation of critical infrastructure such as communications, power generation, water and sanitation services. The local emergency operations center (EOC) and, likely, a joint local/state/federal EOC will be necessary to lead and manage the huge number of participants and resources involved.

The overall biological-warfare response template, along with implementation guidelines, is described in detail in "Interim Planning Guide: Improving Local and State Agency Response to Terrorist Incidents Involving Biological Weapons," which is available at SBCCOM's homeland defense Web site, <http://www2.sbccom.army.mil/hld/bwirp/index.htm>.

Response Template

The individual response components of the template warrant further research. The IRP has done a series of follow-on analyses to build on and refine the template. One involved defining the interface between the criminal and epidemiological investigations after a bio-terrorist incident. The law enforcement community will conduct its criminal investigation. The medical and public health community will perform an epidemiological investigation to identify and control the disease outbreak.

Although each community conducts its respective investigation separately and independently, information from each investigation could aid and assist the other. For instance, identifying the source of the outbreak or the time and place of agent release is relevant to and could be a product of both investigations. Because neither community is accustomed to working with the other, it is possible that information that could benefit one or both investigations will not be exchanged.

In an effort to close this gap, the IRP team partnered with the National Domestic Preparedness Office (NDPO) and sponsored an analytical workshop in January 2000. The workshop's goal was to identify methods to establish information sharing relationships between the law enforcement and the public health communities to ensure the timely and appropriate exchange of information during investigations involving bio-terrorism. Using a panel of law enforcement and public health professionals and working through a structured, intensive three-day workshop, the IRP identified what information is needed for each investigation, who should get the information, how each community could improve its information exchange with the other and what critical decision points exist in each investigation. A complete report of the findings is available at <http://www2.sbccom.army.mil/hld/bwirp/index.htm>.

The original template was derived through intensive analysis of five credible biological threat scenarios. By design, these scenarios were confined to infectious but non-contagious agents. Once a practical, comprehensive strategy for response to a non-contagious agent was developed, this strategy had to be modified to accommodate the more complex case of a contagious agent. Response to a communicable disease is substantially complicated by the possible diverse sources of infection and reinfection.

To analyze and develop solutions to this problem, the IRP partnered with the Centers for Disease Control and Prevention (CDC) to conduct a workshop in April 2000. The goal was to refine the CDC smallpox control plan and strategy by applying it against a credible contagious bio-terrorist attack scenario. The workshop focused on the areas of vaccination, quarantine/isolation and medical surveillance.

A panel of experts found that the response template, with certain modifications, is a practical strategy for minimizing the consequences of a bio-terrorist attack with a contagious agent. Some of these modifications include: adding contact-tracing to the epidemiological investigation, implementing protective measures for criminal investigators, establishing community outreach teams to implement mass immunizations at private homes rather than convene potentially contagious persons at public facilities, limiting public gatherings and mass transportation functions, implementing geographic isolation/quarantining, and establishing more stringent handling, burial and disposition requirements for fatalities.

Although the template was derived by a multi-disciplinary group of responders from various jurisdictions around the nation, the IRP wanted to validate and demonstrate its applicability to different sized communities in various regions of the country. To do so, the IRP team conducted workshops with local first responder and emergency management teams in three communities: Wichita, Kan.; Pinellas County, Fla., and Dover, Del. In each community, the template proved a valuable starting point for development of customized emergency response plans.

In addition to validating the template's broad applicability, these on-site community workshops brought out and identified the key emergency management decisions inherent to biological emergency response. The IRP team collated these decisions into two decision trees, one for an announced biological attack, the other for an unannounced attack. Both decision trees, with more detailed supporting decision trees, are described in "Updated Biological Warfare Response Decision Tree and Response Template," can be accessed at <http://www2.sbcom.army.mil/hld/bwirp/index.htm>.

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