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### **83. THE IMPROVED RESPONSE PROGRAM**

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#### **INTRODUCTION**

In March 1995, the Aum Shinrikyo cult attacked the Tokyo, Japan, subway system with sarin nerve agent. The incident captured international attention and sensitized world leaders to the threat of terrorist use of weapons of mass destruction (WMD). Recognizing this increasing threat, the Congress of the United States passed the National Defense Authorization Act for Fiscal Year 1997, which provided for preparedness training against WMD for the United State's first responders. Because the Department of Defense (DoD) is experienced in defending against chemical and biological agents, 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 weapons and related materials and emergencies involving chemical weapons and related materials." As a result of this legislation, the U.S. Army Soldier and Biological Chemical Command (SBCCOM) developed an improved response program (IRP).

The IRP is an analytical program designed to identify and demonstrate the best practical approaches to improve the overall preparedness of the United States to respond to domestic acts of terrorism involving C (chemical) B (biological) or CB-related materials. This article describes the IRP's mission, major products, and future.

#### **IRP MISSION**

The U.S. military has unique national resources in CB defense technologies. The IRP uses resources to enhance the overall preparedness of civilian emergency responders and managers to respond to and mitigate the consequences of a domestic CB terrorist event. As such, the IRP maintains a partnership between military CB experts and civilian responders and emergency managers. Civilian participants represent functional specialties including emergency management, law enforcement, firefighting, emergency medical services, hazardous-materials management, and public health.

Through this diverse team, the IRP identified, prioritized, and developed solutions to the most pressing response issues associated with domestic CB terrorism. By engaging civilian emergency managers and responders from the program's inception, the IRP has retained an analytical focus bounded by the real-world needs of these civilian response professionals.

#### **CHEMICAL AND BIOLOGICAL AGENTS, FUNCTIONAL DICHOTOMIES**

According to the Centers for Disease Control and Prevention, a significant difference between C and B events is the way medical consequences will unfold over time. The medical casualties of chemical terrorism would usually be "immediate and obvious."<sup>1</sup> Alternatively, biological terrorism "will not have an immediate impact because of the delay between exposure and onset of illness."<sup>2</sup> 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 know that they are infected until days after initial exposure.

Because of these differences between the consequences of C and B terrorism, different disciplines of first responders will be engaged in managing the consequences of each kind of incident. Chemical terrorism will likely engage firefighters, law-enforcement personnel, and emergency medical services that converge at an incident scene. Biological terrorism will likely engage nurses, physicians, and other medical providers who treat patients at hospitals and clinics days after the initial event. Because of the differences B and C agents, the IRP focuses separately in these two areas.

## **BIOLOGICAL TERRORISM**

### **CHARACTERISTICS OF DOMESTIC BIOTERRORISM**

The overriding consequence of a large-scale, unannounced bioterrorist attack will be the anomalous occurrence of a large number of medical casualties.<sup>3</sup> Response systems must provide the appropriate types and amounts of medical treatments and services. However, the full spectrum of potential consequences is broader than medical casualties.

A well-conducted bioterrorist attack will strain the public-health medical-surveillance systems. It will require responders to make quick, accurate medical diagnoses and disease identifications. A bioterrorist event is a criminal act that requires a complex criminal investigation. Depending on the agent used in an attack, such an incident could result in residual environmental hazards that would require mitigation. A significant portion of a metropolitan area's population may have to be medically managed and physically controlled. The aforementioned medical-treatment, criminal-investigation, environmental-hazard-mitigation, and population-control activities will require a nationally coordinated and integrated command-and-control function.

### **DESIGNING THE BIOLOGICAL WEAPONS (BW) IRP TEAM**

The above considerations influenced the makeup of the BW IRP team. Because the problems inherent in a bioterrorist attack are multifaceted, the final team consisted of more than 60 civilian response professionals, eight federal agencies, six Department of Energy national laboratories, and 11 DoD organizations. Having assembled a strong team, the SBCCOM began to define broad parameters of the overall process for the BW IRP. The process first had to provide a forum to educate the entire team on the offensive and defensive aspects of bioterrorism. Second, the process had to yield an initial set of integrated response activities to manage and mitigate the full spectrum of consequences that would emerge from a large-scale bioterrorist attack.

### **THE BW IRP PROCESS**

The BW IRP process was designed around five 3-day technical workshops. Day one of each workshop consisted of a series of 1-hour tutorials on preselected topics such as the physics of aerosol dispersion, pathogenic microbiology of BW agents, biodetection, medical prevention and intervention, and decontamination of and physical protection against BW agents. Although the topics remained the same, the depth and complexity of the tutorials increased as the team progressed through each of the five workshops. Day two of each workshop began with the presentation of a selected BW terrorist-attack scenario. From Workshop 1 through Workshop 5, the respective terrorist-attack scenarios increased in scale from an attack on a single building to an attack on an entire metropolitan area. After reviewing each scenario, workshop participants identified a series of specific response activities designed to mitigate the emerging consequences of the given bioterrorist-attack scenario.

On day three of each workshop, the team reviewed and integrated the complete set of response activities. The team also analyzed the integrated activities to identify response shortfalls and possible response improvements. Throughout the reviews, the team took a "bottom-up" approach and *let the problem drive the solution*.

### **BW IRP PRODUCTS**

The BW IRP team identified a myriad of response activities spanning multiple functional areas. To be useful and understandable, these activities needed to be organized into a logical and integrated response system. Thus, the team formulated a generic bioresponse template (see table 1) that embodied the concepts and work breakdown structure a city needed to respond to effectively in a bioterrorist event. This template serves as a useful starting point for cities to prepare their own local plans to respond to a bioterrorism.<sup>4</sup>

### **CHEMICAL TERRORISM**

#### **DESIGNING THE CHEMICAL WEAPONS (CW) IRP TEAM**

The SBCCOM possesses world-class technical experts knowledgeable in defense against chemical warfare agents on military battlefields, but not necessarily in civilian environments. SBCCOM needed to involve civilian emergency responders to identify and solve many of the unique difficulties in civilian response to chemical terrorism. This involvement contributed to the ready acceptance of response guidance developed by the chemical weapons (CW) IRP and made the program a success across the national emergency-response community. The CW IRP is organized into four groups that address distinct functional areas in an emergency response. These groups are: law enforcement, public health and safety, emergency management, and emergency response. Each group conducts exercises that help identify the difficulties encountered in civilian response to chemical terrorism. Once identified, these difficulties are addressed using a think-tank approach involving the overall CW IRP.

#### **THE CW IRP PROCESS**

In developing solutions, the CW IRP relies on technical studies conducted by its chemical-defense experts. Solutions often involve novel applications of equipment and techniques that emergency responders already employ in other emergency situations. The CW IRP's unique combination of chemical-warfare-agent expertise and operational know-how in civilian emergency response enable it to develop improved response guidance and methods that are scientifically accurate and operationally practicable. To ensure that new response concepts are workable, they are operationally tested in functional exercises. Civilian responders have found that they can readily incorporate the CW IRP's response concepts into their own response plans.

#### **ACCOMPLISHMENTS OF THE CW IRP**

Improving civilian response to chemical terrorism requires addressing personal protection, decontamination, and medical treatment of chemical-agent victims. The CW IRP team has performed technical initiatives in each of these areas and has developed improved guidance and response methods. The SBCCOM does not dictate emergency-response requirements and procedures. The emergency-response community holds the authority to adopt or reject the CW IRP's improved response guidance and methods. To date, the guidance and methods have helped many jurisdictions develop emergency-response procedures that can maintain the safety of the emergency responders while minimizing the impact of chemical terrorism and maximizing the effectiveness of emergency-response

assets. For decontamination of chemical-agent victims, the CW IRP team examined previous research reports and studies on the removal of chemical agent from the skin and found that rinsing with large amounts of plain water is the best way that firefighters can most rapidly decontaminate chemical-agent victims. The CW IRP team has developed guidance on how firefighters can use their fire-fighting equipment to decontaminate large numbers of chemical-agent victims quickly.<sup>5</sup> Fire rescue personnel were recognized as likely to encounter chemical-agent vapors during early response to a chemical terrorism event, and it was initially not known whether or not brief vapor exposures would be highly lethal to firefighters using normal personal protective equipment (PPE), including a self-contained breathing apparatus. This uncertainty threatened a fundamental firefighter mission—saving lives by rapid reaction.

The CW IRP tested firefighter's PPE and determined how much protection the equipment offers. Using this information, the CW IRP team demonstrated that firefighters could arrive on scene and proceed with reconnaissance and rescue, with known and minimal risk of any significant chemical-agent effects.<sup>6</sup> The CW IRP team showed how firefighters can use positive-pressure ventilation fans to further reduce the risk associated with rescue in an enclosed space containing chemical-agent vapors.<sup>7</sup> Firefighters often use positive-pressure ventilation fans to remove dangerous gases from buildings. The CW IRP team demonstrated that these techniques and procedures apply equally well to chemical-agent contamination.

#### **ON-GOING IRP INITIATIVES**

The IRP team is continuing its efforts to develop improved response capabilities. For biological events, the IRP is validating and improving the BW response template through tests and exercises. The BW IRP team analyzed the overall structure of the bw response template to identify the key decisions that public officials will have to make to respond effectively to a biological threat.<sup>8</sup> The response template was evaluated as a total, integrated response system in three national regions. The regions were of varying populations and geographically dispersed. These evaluations provided feedback on the general applicability of the template and validated how it could be adapted to various localities in different regions and with different population bases. In addition, the bw team is identifying useful "triggers" or "flags" that could guide decision makers in determining if a covert biological attack has occurred.

The BW IRP team is also working to develop biodecontamination techniques, subway biosurveillance technologies, emergency response management software, and biocasualty projection methods to assist civilian emergency managers in assessing the consequences of a bioterrorist attack. Last, the combined BW and CW teams are developing chemical and biological protection measures for buildings.

The CW IRP team is currently working with the law enforcement tactical teams to perform PPE assessments similar to those that have helped fire departments. This work measures the protection that law-enforcement personnel receive from various PPE systems and assesses the risk of receiving chemical-agent symptoms from missions in chemically contaminated environments. This information allows law-enforcement personnel to match PPE configurations with mission activities to effectively manage the risks of potential chemical threats.

The CW IRP team is developing the operational plans for an off-site triage treatment and transportation center (OST3C) to provide medical care of chemical victims. The OST3C plan is designed to keep contamination out of existing medical facilities. An OST3C will help the community deal with large numbers of chemical victims, without dangerously

contaminating and having to close its valuable medical facilities. Once decontaminated and given initial medical care at the OST3C, more severe chemical victims can be safely moved to existing medical facilities.

The CW IRP team is continuing to develop guidance on handling chemically contaminated fatalities and follow-on medical care and handling procedures for victims who suffered acute exposure to chemical agents. These efforts will help medical examiners and professionals safely manage chemical fatalities and exposed victims.

## CONCLUSIONS

The IRP has provided civilian emergency managers and first responders logical response solutions that they can use as a starting point to improve their overall preparedness for CB terrorism. Through the IRP, first responders identified pressing response problems and solutions that work in the real world. The IRP's solutions are based on equipment and expertise already possessed by the first responders.

Continuing IRP efforts will focus on the requirements of military installation responders and response units. From experience, the U.S. military knows that being prepared to defend against CB warfare is the most effective deterrent to such warfare itself. The efforts of the IRP can not eliminate CB terrorist threats. However, it is hoped that improved preparedness to defend ourselves against these threats will lead terrorists to realize that their desired ends will not be achieved because our civilian emergency response community is prepared and capable of effectively defending against such incidents.

## REFERENCES

<sup>1</sup>Centers for Disease Control and Prevention, "Biological and Chemical Terrorism: Strategic Plan for Preparedness and Response," April 21, 2000/Vol.49/No. RR-4, 3.

<sup>2</sup>Ibid.

<sup>3</sup> SBCCOM, "Biological Weapons Improved Response Program (BW IRP) Executive Summary," March 1999. Available: <http://dp.sbccom.army.mil/>.

<sup>4</sup> A more detailed description of the BW response template and its response components can be found in SBCCOM's "Improving Local and State Agency Response to Terrorist Incidents Involving Biological Weapons - Interim Planning Guide," August 1999. Available: <http://dp.sbccom.army.mil/>.

<sup>5</sup> SBCCOM, "Guidelines for Mass Casualty Decontamination During a Terrorist Chemical Agent Incident," January 2000. Available: <http://dp.sbccom.army.mil/>.

<sup>6</sup> SBCCOM, "Guidelines for Incident Commander's Use of Firefighter Protective Ensemble (FFPE) with Self-Contained Breathing Apparatus (SCBA) for Rescue Operations During a Terrorist Chemical Agent Incident," August 1999. Available: <http://dp.sbccom.army.mil/>.

<sup>7</sup> SBCCOM, "Use of Positive Pressure Ventilation (PPV) Fans to Reduce the Hazards of Entering Chemically Contaminated Buildings," July 1999. Available: <http://dp.sbccom.army.mil/>.

<sup>8</sup> SBCCOM, "Biological Weapons Improved Response Program (BW IRP) Response Decision Tree Workshop," August 1999. Available: <http://dp.sbccom.army.mil/>.

## KEY WORDS

Terrorism, biological terrorism, biological agents, chemical terrorism, chemical agents, chemical warfare, weapons of mass destruction, SBCCOM, Improved Response Program, emergency management, emergency medical services, hazardous-materials, public health, medical response, medical surveillance, bioresponse template, personal protection, decontamination, medical treatment

**TABLES AND FIGURES**  
**Table 1. BW IRP Response Template**

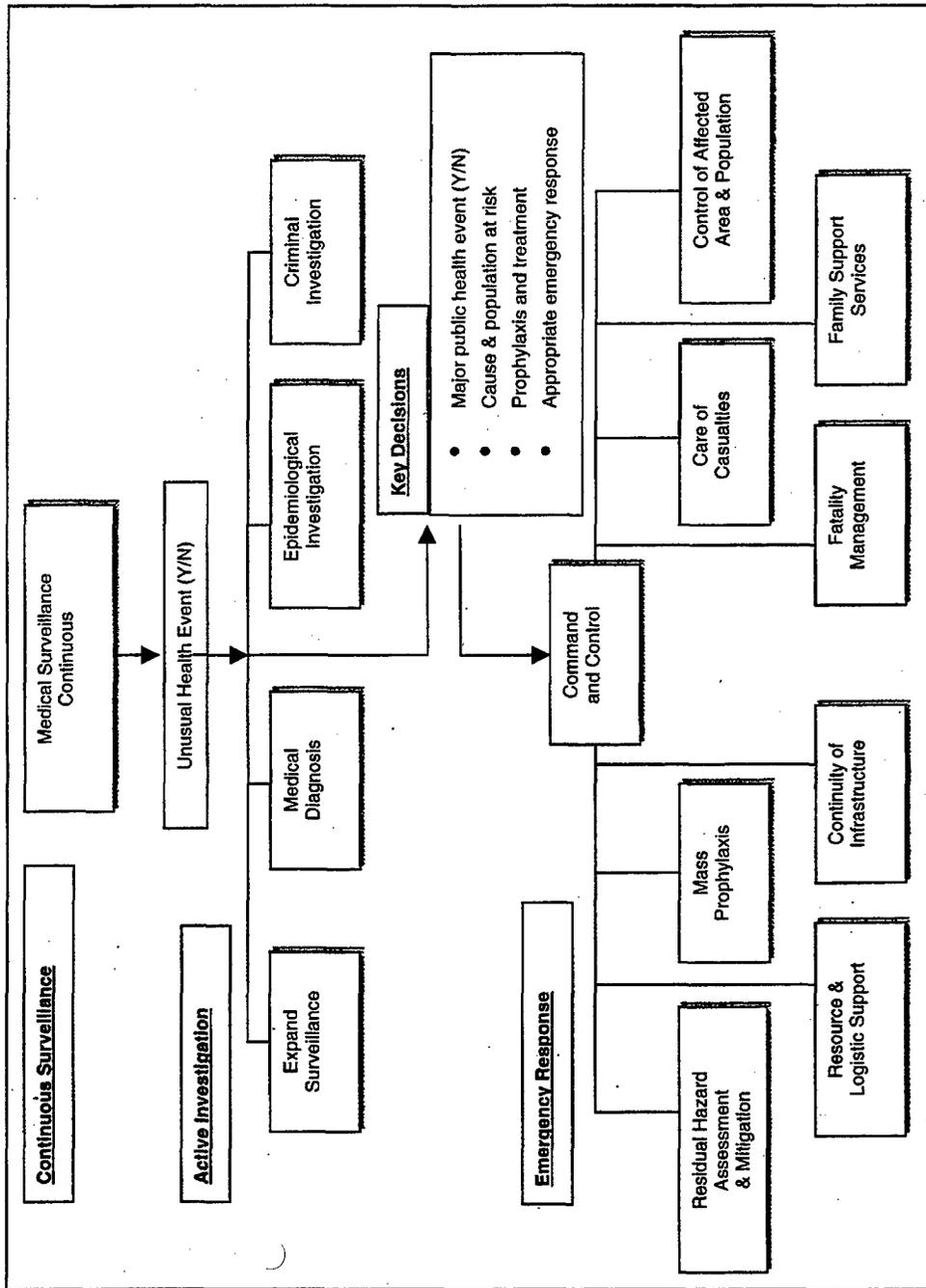


Figure 1. BW Response Template Components and Key Decisions

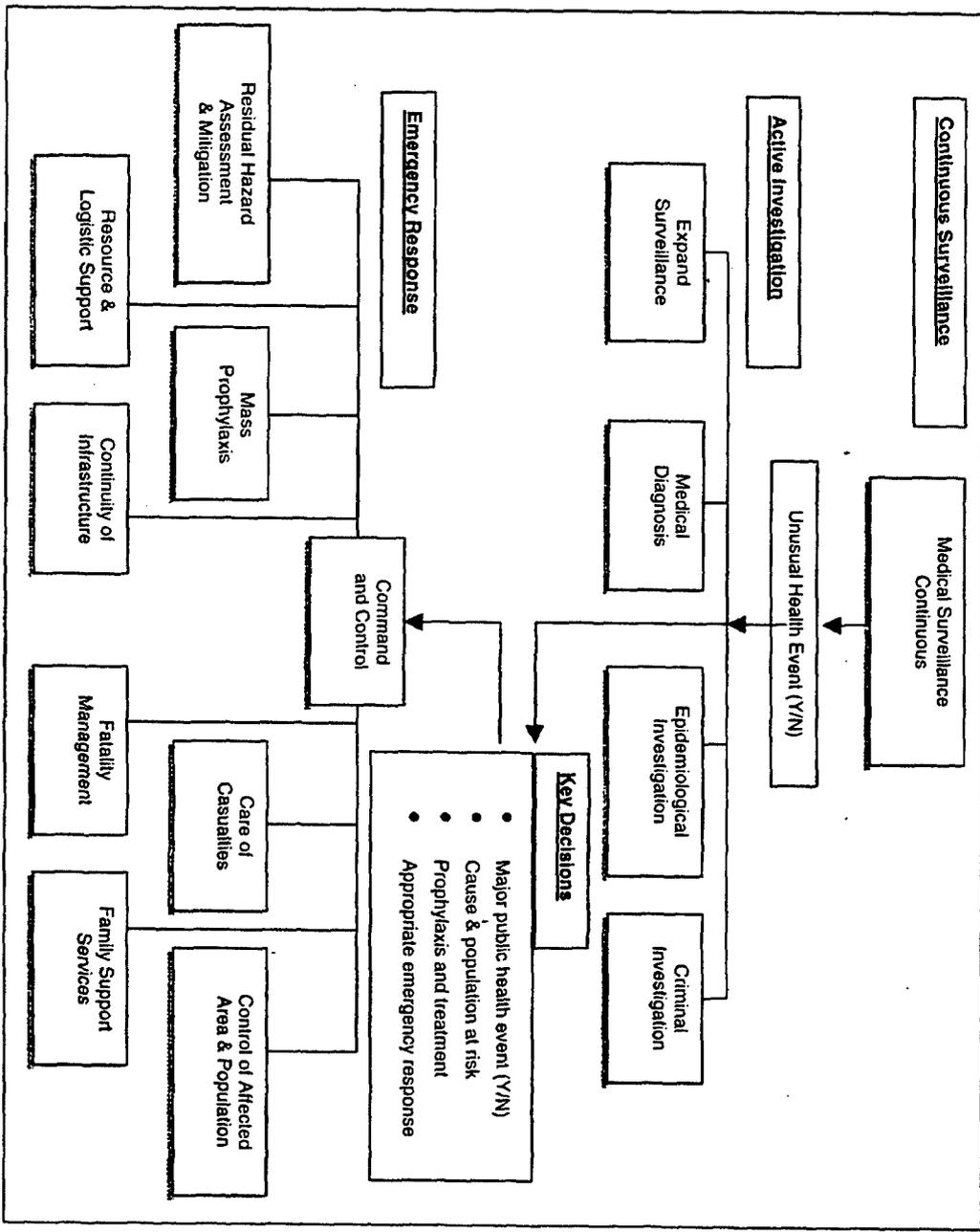


Figure 2. Modular Emergency Medical System

