

# CRB



CALIFORNIA  
STATE LIBRARY  
FOUNDED 1850

**California Research Bureau**

900 N Street, Suite 300  
P.O. Box 942837  
Sacramento, CA 94237-0001  
(916) 653-7843 phone  
(916) 654-5829 fax

## **Responding to Bioterrorism: Assessing California's Preparedness**

*By Raymond A. Zilinskas, Ph.D.  
and  
Jason Pate, MPM, EMT-1*

*Done at the Center for Nonproliferation Studies  
Monterey Institute of International Studies  
Monterey, California 93940*

Report prepared for the California Research Bureau  
with funding provided by the  
California HealthCare Foundation

**MARCH 2002**

**CRB 02-004**

# **Responding to Bioterrorism: Assessing California's Preparedness**

*By Raymond A. Zilinskas, Ph.D.  
and  
Jason Pate, MPM, EMT-1*

**ISBN 1-58703-151-5**



# Contents

<b>INTRODUCTION</b> .....	<b>1</b>
<b>BACKGROUND</b> .....	<b>4</b>
<b>OVERVIEW OF CALIFORNIA BIOTERRORISM RESPONSE</b> .....	<b>7</b>
STANDARDIZED EMERGENCY MANAGEMENT SYSTEM (SEMS).....	7
California Terrorism Response Plan (CTRP).....	8
<b>RESPONSIBILITIES OF AGENCIES AND ORGANIZATIONS IN CALIFORNIA BIOTERRORISM RESPONSE</b> .....	<b>11</b>
<b>CALIFORNIA STATE AUTHORITIES</b> .....	<b>11</b>
Legislation.....	11
Governor’s Office of Emergency Services (OES) and California Terrorism Response Plan (CTRP).....	12
Emergency Medical Services Authority (EMSA).....	13
California Department of Health Services (DHS).....	13
California Master Mutual Aid Agreement.....	15
Civil Support Teams (CSTs).....	15
<b>LOCAL AUTHORITIES</b> .....	<b>15</b>
Metropolitan Medical Response System (MMRS).....	16
Local Public Health Departments.....	17
Local Metropolitan Area Efforts.....	18
<b>FEDERAL AUTHORITIES</b> .....	<b>18</b>
Office of Homeland Security (OHS).....	18
Nunn-Lugar-Domenici Domestic Preparedness Program.....	19
Centers for Disease Control and Prevention (CDC).....	19
Federal Bureau of Investigation (FBI).....	20
Federal Emergency Management Agency (FEMA).....	20
<b>NON-GOVERNMENTAL ORGANIZATIONS</b> .....	<b>20</b>
<b>ROLE SEQUENCING OVER TIME</b> .....	<b>21</b>
<b>RECOMMENDATIONS TO IMPROVE BIOTERRORISM PREPAREDNESS IN CALIFORNIA</b>	<b>23</b>
BIOTERRORISM RESPONSE PLANNING.....	23
LONG-TERM STUDY OF BIOTERRORISM.....	24
<b>ACKNOWLEDGEMENT</b> .....	<b>27</b>
<b>ANNEX 1</b> .....	<b>29</b>
<b>CALIFORNIA TERRORISM RESPONSE PLAN:</b> .....	<b>29</b>
Purpose, Scope, and Objectives (as Shown on Page 1 of the Plan, Available From <a href="http://www.oes.ca.gov">http://www.oes.ca.gov</a> ) and Organizational Chart.....	29
Purpose.....	29
Scope.....	29
Objectives.....	29
<b>ANNEX 2</b> .....	<b>31</b>
<b>FOUR CASES OF BIOLOGICAL TERRORISM</b> .....	<b>31</b>
The Rajneeshees.....	31
The Aum Shinrikyo Cult.....	31
Biological Event in Dallas, Texas.....	32
Letters Laden with <i>Bacillus anthracis</i> Spores, September – October 2001.....	33
<b>ANNEX 3</b> .....	<b>35</b>
<b>GLOSSARY</b> .....	<b>35</b>
<b>ANNEX 4</b> .....	<b>39</b>
<b>CRITICAL BIOLOGICAL AGENTS AS LISTED BY THE CDC</b> .....	<b>39</b>
Category A.....	39

Category B.....	39
Category C.....	40
<b>ANNEX 5.....</b>	<b>41</b>
STAGES OF A BIOTERRORIST ATTACK.....	41
Preparatory Stage .....	41
Attack Stage.....	41
Casualty Presentation Stage.....	42
Quarantine .....	42
Triage, Treatment, and Disposition Stage.....	43
Resolution Stage.....	44
<b>ANNEX 6.....</b>	<b>47</b>
SEQUENCING TIMELINE.....	47
<b>ANNEX 7.....</b>	<b>49</b>
ACRONYMS AND THEIR DEFINITION.....	49
<b>ANNEX 8.....</b>	<b>51</b>
IN FORCE AND PENDING FEDERAL LEGISLATION RELATED TO BIOTERRORISM AS OF MARCH 1, 2002 .....	51
BIOTERRORISM PREPAREDNESS ACT OF 2001, S. 1765 .....	51
PUBLIC HEALTH SECURITY AND BIOTERRORISM RESPONSE ACT OF 2001, H.R. 3448 .....	51
DEPARTMENT OF DEFENSE APPROPRIATIONS BILL, H.R. 3338.....	51
BIOTERRORISM PREPAREDNESS ACT OF 2001, H.R. 3310 .....	51
BIOTERRORISM PROTECTION ACT (BIOFACT) OF 2001, H.R. 3255 .....	51
DEADLY BIOLOGICAL AGENT CONTROL ACT OF 2001, S. 1661 .....	51
ANTITERRORISM LEGISLATION, H.R. 3162 .....	52
BIOTERRORISM ENFORCEMENT ACT OF 2001, H.R. 3160.....	52
BIOWEAPONS CONTROL AND TRACKING ACT OF 2001, S. 1706.....	52
DEADLY BIOLOGICAL AGENT CONTROL ACT OF 2001, H.R. 3306 .....	52
PATHOGEN RESEARCH, EMERGENCY PREPAREDNESS AND RESPONSE EFFORTS ACT OF 2001, S. 1635 ....	53
<b>ANNEX 9.....</b>	<b>55</b>
ENDNOTES AND REFERENCES.....	55

## INTRODUCTION

In 1995, two unprecedented events focused the attention of policymakers, academics, and analysts on the threat of terrorism involving weapons of mass destruction (WMD). In March 1995, members of the Japanese cult Aum Shinrikyo released sarin nerve agent in the Tokyo subway, demonstrating that chemical weapons are within reach of some terrorist groups. In April 1995, domestic terrorists bombed the Alfred P. Murrah Federal Building in Oklahoma City, bringing the threat of terrorism capable of generating mass casualties to the American heartland.

In response to these events, as well as other developments demonstrating the international proliferation of WMD, beginning in approximately 1996 the U.S. government elaborated policies to address the threat of WMD terrorism. The resulting massive efforts to improve the ability of governments at the local, state, and federal levels to defend against and, should defense fail, manage the consequences of terrorism involving the use of WMD have been repeatedly criticized as being redundant, overlapping, and poorly coordinated. Much of this criticism appears to be justified by the findings of several exercises, such as *Topoff* and *Dark Winter*, during which the response mechanisms of local and federal government agencies were put to the test by simulated biological attacks involving either contagious or non-contagious pathogens.<sup>1</sup> The findings of these exercises showed uniform results—local resources would be quickly overwhelmed if a mass-casualty event were to occur, and assistance efforts by the involved state governments and federal government would be seriously hampered by the inability of agencies to communicate with one another and settle jurisdictional issues.

In September 2001, the first of seven letters containing spores of *Bacillus anthracis* (the bacterium that causes anthrax) was mailed to a Florida publisher. By the time this biological letter bomb campaign ceased in November 2001, 22 persons were sickened, of whom five died. As this is written, it is not known who perpetrated the attacks and for what purpose. What is known is that this campaign, which in terms of public health caused a very small number of casualties, revealed many of the inadequacies of state and federal response plans for terrorist attacks with biological weapons. In particular, there are significant problems with how well local and federal authorities are prepared to respond to biological terrorism and how well the work of the many agencies who have roles in responding to biological events is coordinated.

Although there have been some training exercises involving simulated bioterrorist events that would generate mass casualties, California has so far not suffered an actual bioterrorist attack. Thus, the provisions of the updated California Terrorism Response Plan (CTRP),<sup>2</sup> which is an annex to the State Emergency Plan, have not been realistically tested. The CTRP's scope is to provide "...direction to state agencies and local governments within California involved in protecting public safety, and preparing for and responding to terrorist events" (the purpose, scope, and objectives of the CTRP are reproduced in Annex 1). As can be imagined, the CTRP defines the roles of numerous agencies, offices, and organizations in the general terrorism preparedness effort. What the CTRP does not do is to address bioterrorism, except in general terms. In fact, the CTRP tends to group chemical and biological terrorism together under one heading.

Further, it does not mention terrorism against animals and plants. In view of the different characteristics of chemicals and microorganisms, which necessitate differing response mechanisms to chemical and biological attacks, most knowledgeable security experts find it advisable to address the two separately.

The etiology of some bioterrorist attacks will be obvious. For example, were there to be a large-scale outbreak of inhalation anthrax anywhere in the U.S., public health and police investigators would be certain to consider it to have been deliberately brought about. In this obvious situation, terrorism response plans developed by local and federal agencies can be implemented immediately. However, in most cases when a disease outbreak occurs, none of those who initially respond to this event, be they primary health providers, emergency service personnel, veterinarians, or plant pathologists, are likely to know its etiology. Usually, unless there is clear evidence to the contrary, it will be assumed that a disease outbreak has a natural origin. The biological attack carried out by the Rajneeshees is illustrative (see Annex 2). The point is that since a disease outbreak is at first likely to be believed to have a natural origin, the terrorism response plans available to local and state authorities are not likely to be implemented. Instead, plans developed by public health authorities or agricultural services to meet the threats and exigencies of naturally occurring diseases are likely to be put into effect. It is only later, as epidemiological evidence indicates that an outbreak's etiology is likely to have been a deliberate act, that local police and the FBI would be so informed and authorities would decide whether to implement terrorist response plans. As can be realized, it might well be that a state's terrorism response will not be implemented when a disease outbreak brought about by terrorists first becomes manifest, but rather when it is well underway. This "backing in" into implementation is likely to lead to confusion among agencies having important responsibilities under such a plan. The implication of this observation, which is discussed further below, is that it might be worthwhile for the state of California to have a public health response plan that also addresses bioterrorism rather than a terrorism response plan that includes bioterrorism.

Recognizing the substantial differences between biological and chemical terrorism, this report focuses on bioterrorism (see Annex 3 for Glossary) and California's preparedness for bioterrorist attacks. It has six sections and nine annexes. First, the Introduction sets the context for this report. Second, the background section sets forth assumptions on what constitutes a bioterrorist attack and lists bioterrorist scenarios. Third, we provide an overview of California's preparedness for bioterrorism, including descriptions of the Standardized Emergency Management System (SEMS) and the CTRP. The fourth section includes brief descriptions and discussions of the agencies and organizations given key responsibilities for bioterrorism response in the CTRP. Fifth, the roles of agencies and organizations over the time that a bioterrorist attack occurs and is managed are analyzed; i.e., where and how agency roles overlap and occur simultaneously. It is important to note that the report's intent is not to assess any organization's effectiveness but rather provide an overview of the network of responders. By doing so, this report provides a basis for policy recommendations, which comprise the sixth section of this report.

The report's nine annexes contain specialized information. Thus, Annex 1 lists the purpose, scope, and objectives of the CTRP; Annex 2 briefly describes four known bioterrorist events; Annex 3 has a Glossary where technical terms are defined; Annex 4 lists biological threat agents as determined by the Centers for Disease Control and Prevention (CDC); Annex 5 discusses the stages of a bioterrorist attack; Annex 6 is a diagram of role sequencing over time; Annex 7 lists acronyms and their definition; Annex 8 contains a listing of federal legislation that was in force or pending as of March 1, 2002; and Annex 9 includes endnotes and the references cited in the text.



## BACKGROUND

Three assumptions underlie this report's consideration of a bioterrorist attack. The bioterrorists will: (1) use one or more types of bacterial, fungal, or viral pathogen to achieve their objectives (see Annex 4 for a listing of human pathogens); (2) endeavor to disseminate a sufficient quantity of the pathogen over or onto the target population to cause illness or death to most of its members; and (3) use such means of delivering the pathogens as aerosol dissemination, contamination of food or water, direct application to a targeted individual, or contagion by previously infected individuals. With these assumptions in mind, there are five scenarios for bioterrorist attacks. Terrorists can use:

- incapacitating or low-lethality pathogens to disable members of a targeted human population;
- lethal pathogens to kill members of a targeted human population;
- pathogens or stimulants to cause disorder and/or anguish among a targeted population;
- pathogens to sicken or kill a population of animals; or
- pathogens to kill a population of plants.

It is important to list these scenarios in order to make clear that one set of agencies or organizations would be involved in responding to a bioterrorist attack on humans, but another set (with some overlap) when the target is agriculture.<sup>3</sup> This report does not consider hoaxes.

It bears noting that the terrorist use of chemical weapons would create a markedly different situation than if biological weapons were employed. In particular, the effects of chemical weapons will be discerned almost immediately after the agent is dispersed; i.e., within a few minutes of a chemical agent having been dispersed, nearby persons will exhibit signs of intoxication and, if the concentration of the agent is high enough, some of them will become unconscious and fall to the ground. The rapidity with which chemical agents act obviously has implications for first providers. Usually, if the heavily affected individuals are not immediately and correctly treated, they will die before reaching an Emergency Medical Department (EMD). In addition, since many of the chemical weapons agents are persistent, persons who become contaminated with such an agent will emanate fumes. These persons must be thoroughly decontaminated, or they will give off fumes that can affect first responders and EMD staff. Conversely, were a biological attack to occur, there will always be an incubation period during which the pathogen is propagating within the victim's body, but the victim shows no sign of illness. For example, if a person inhales a large quantity of *Bacillus anthracis*, a period of three to six days will pass before that person exhibits the first symptoms of anthrax. To complicate matters, at an early stage of most illnesses the symptoms usually are general, thus making it almost impossible for an EMD to make an accurate diagnosis until time has passed and indicative symptoms appear. Usually there will be no need to decontaminate someone who is affected by a biological weapon (BW) since the causative pathogen is unlikely to be present in sufficient quantity on the victim to present a threat to others. Further, a biological attack may utilize a contagious pathogen, such as *Yersinia pestis* or a

hemorrhagic fever virus. If so, secondary spread of the pathogen is likely to occur, creating a very difficult situation for first responders, health providers, and public health services.

It can be realized from the foregoing that the type of first responder to a chemical event would be different from a biological event. For a chemical event, the first responders will be firefighters, paramedics, and police (which would also be the case for attacks where conventional weapons and high explosives are used). However, those who would first respond to a biological attack are likely to be EMD staff, primary care physicians, and persons staffing physician offices.



## **OVERVIEW OF CALIFORNIA BIOTERRORISM RESPONSE**

In this section, we briefly describe and discuss the key elements of California terrorism response planning.

### **STANDARDIZED EMERGENCY MANAGEMENT SYSTEM (SEMS)**

Beginning on October 20, 1991 and lasting for three days, a fire destroyed approximately 1,580 acres and over 2,700 structures in the East Bay Hills, Oakland. The fire took 25 lives and caused over \$1.68 billion in damages. It was the most expensive fire disaster in California history. In the aftermath, there was much criticism of how firefighters and other responders had managed this disaster. Responding to this criticism, the California legislature adopted a law that directed the Governor's Office of Emergency Services (OES) to coordinate with other state and local agencies to establish SEMS. Thus, by law state agencies must use SEMS when responding to emergencies or disasters involving multiple jurisdictions and multiple agencies. Since training is essential to maintain the effective use of SEMS at all levels of government, OES has developed a course of instruction that can be used by personnel at agencies having responsibilities in disaster response and relief.

SEMS is a management system that provides an organizational framework for the coordinated function of response agencies. The legislature designed SEMS to be flexible and adaptable by agencies to meet any of the many types of disasters that can occur in California. SEMS can operate at five levels, though in actuality only the level or levels required to respond to a particular emergency is or are activated. The five levels are:<sup>4</sup>

- **Field:** commands responders and resources to carry out tactical decisions and activities in direct response to an incident or threat;
- **Local:** manages and coordinates response and recovery activities within local jurisdictions;
- **Operational Area:** manages and coordinates information, resources, and priorities among local governments and special districts within the geographical boundaries of a county and serves as a coordination and communication link between the local level and regional level;
- **Regional:** manages and coordinates information and resources among operational areas within the mutual aid region and between operational areas and the state level. The regional level and state level coordinate overall state agency support for emergency responses; and
- **State:** manages state resources in response to the emergency needs of the other levels, manages and coordinates assistance among mutual aid regions and between the regional and state levels, and serves as a coordination and communication link between the five local and state levels and the federal disaster response system.

SEMS incorporates the Incident Command System (ICS), which was originally developed by the fire services to provide a standard system for managing emergencies.

ICS provides a common organizational framework within which agencies can work collectively at the scene of an emergency. There are five primary functions within the ICS management structure:

- **Command:** the Incident Commander (IC) is responsible for on-scene command of an incident or an event;
- **Operations:** responsible for the coordinated tactical response directly applicable to, or in support of the mission(s) in accordance with the Incident Action Plan (a written or oral plan drafted by the IC that establishes goals and defines the operational period);
- **Planning/Intelligence:** responsible for the collection, evaluation, and documentation of information about the development of the incident and the status of resources;
- **Logistics:** responsible for providing facilities, services, personnel, equipment, and materials in support of the incident; and
- **Finance/Administration:** responsible for all financial and cost analysis aspects of the incident, and for any administrative aspects not handled by the other functions.

SEMS allows the ICS to grow or shrink according to the demands of the particular emergency. For example, were five persons to become seriously ill in a village, a public health official from a county or city may be designated as IC, and he or she probably would require little assistance beyond what can be provided by a local hospital. On the other hand, if an outbreak of foot-and-mouth disease affected several animal pens simultaneously, a Veterinary Coordinator may be assigned as IC from the California Department of Food and Agriculture or the University of California, Davis, and be provided with a sizeable staff, including an Assistant Coordinator, with representation from OES, National Guard, Highway Patrol, etc. In general, as the number of persons working under a supervisor exceeds five, another level of supervision can be created to maintain an optimum ratio between managers and workers. As the emergency decreases, the ICS can shrink as appropriate.

### **California Terrorism Response Plan (CTRP)**

The CTRP, which is an annex to California's State Emergency Plan, supercedes the Nuclear Emergency/Terrorism Response Plan of 1991. Its stated purpose is to provide a basis for all state agencies to develop procedures for responding to terrorist incidents involving nuclear, chemical, and biological weapons. The director of OES notes that the CTRP "should be used by local government in conjunction with the Local Planning Guidance on Terrorism Response."

The CTRP also establishes the State Strategic Committee on Terrorism (SSCOT), which is chaired by the director of the OES. It is tasked to "provide[s] advice to OES management during validated terrorist threats or actual incidents" (the term "validated" is not defined). SSCOT is comprised of individuals possessing various kinds of expertise who meet at least quarterly, maintain continuous communications between meetings, and

are available for rapid consultations should the need arise. The core membership of SSCOT can be augmented according to need by specialists from other agencies, such as OES, Department of Justice, National Guard, Emergency Medical Services Authority, Department of Health Services (DHS), Department of Food and Agriculture, and others. The responsibilities of SSCOT include: (1) serve as a forum for state terrorism planning and policymaking; (2) take part in the development and updating of the State Terrorism Plan, Terrorism Strategic Plan, and other publications related to terrorism; (3) oversee the use of grants addressing terrorism and develop a comprehensive strategy to secure grants for state agencies and other entities; and (4) provide a forum for the exchange of information on terrorism trends and technologies.

In the aftermath of the first anthrax case caused by spores delivered by letter, Governor Gray Davis issued an executive order for the SSCOT to set up several subcommittees, including one called "Protection of Public Health."<sup>5</sup> The committee presented a confidential report to the Governor on October 25, 2001, the contents of which had not been released as of this writing.<sup>6</sup> In addition, SSCOT was at the same time directed to "develop recommendations for prevention and response to terrorist acts in California ...by October 30." Initial recommendations were submitted at the end of October. The final SSCOT report was conveyed by OES Director Dallas Jones on February 22, 2002.<sup>7</sup> It contains a listing of 131 recommendations, which cover defenses against possible biological, chemical, conventional, cybernetic, and nuclear terrorist attacks against both human and agricultural targets. Of these recommendations, the largest number pertains to "Public Information and Education." According to the OES website, nine recommendations would require federal action. The others are under review or in the process of being completed.

An important subgroup of the SSCOT is the State Threat Assessment Committee (S-TAC), which provides "an on-going capability for rapid assessment of information regarding the potential impacts from specific terrorist's threats and incidents." S-TAC's most important responsibility is to provide real-time threat assessments and convey the findings of these assessments to the Governor, state constitutional officers, and legislative leaders. The core membership of S-TAC consists of representatives from OES, Department of Justice, National Guard, Highway Patrol, and FBI, but this membership may be augmented from other agencies as necessary depending on circumstances. Thus, were a bioterrorist event to occur, we would expect that one or more representatives from the DHS or Department of Agriculture as appropriate would immediately be asked to join S-TAC.

The CTRP adopts the federal concept for terrorism response, which includes crisis management and consequence management. Crisis management is defined as "the law enforcement response to the causes of terrorist incidents, terrorists, and their weapons" and typically includes traditional law enforcement missions, such as intelligence, surveillance, forensics, etc., and technical support missions, including agent identification, transfer and disposal, decontamination, and others. The CTRP submits that the federal government has preeminent authority in crisis management, with the FBI as lead agency.

Consequence management “addresses the consequences of terrorism, the effects upon people and their property and communities.” The State of California and local agencies have preeminent authority to manage the consequences of terrorism. Under SEMS, on-scene authority rests with the IC and local emergency services organizations. As necessary, the federal government may provide assistance with FEMA as the lead agency. CTRP notes that crisis and consequence management can occur simultaneously during a threat of actual terrorist attack. If so, the FBI and FEMA would initiate crisis and consequence management actions concurrently, with FEMA consulting with OES. Once a terrorist incident has occurred, state and federal agencies will coordinate their responses according to the California-Federal Emergency Operations Center Guidelines.

The CTRP has a special section titled “Chemical/Biological Terrorism Response Plans,” which specifies that California’s technical response to chemical/biological incidents is guided by the Hazardous Materials Incident Contingency Plan (HMICP). The HMICP is written primarily for state agencies to guide them in understanding the state’s role in hazardous material emergencies. Secondarily, the HMICP may be utilized by local and federal governments, and private organizations to clarify their roles and relationships concerning hazardous material emergencies. OES is the lead state agency for any terrorist event involving chemical and biological weapons. The CTRP has lengthy sections on agency roles and responsibilities and state resources that can be brought to the forefront in case of a terrorist attack, but lack of space does not permit a further discussion of this important document.

# RESPONSIBILITIES OF AGENCIES AND ORGANIZATIONS IN CALIFORNIA BIOTERRORISM RESPONSE

The roles and responsibilities of key agencies and organizations listed in the CTRP in regards to bioterrorism are reviewed in this section. (See Annex 1 for an Organizational Diagram.) Our discussion includes relevant legislation in force and under consideration.

## CALIFORNIA STATE AUTHORITIES

This section lists the key players at the state level and describes their roles in a bioterrorist response. It also outlines current and pending bioterrorism-related legislation in California. In general, state structures are designed to provide guidance to local planning efforts and to serve as a mechanism to involve state assets as required during a response.

### Legislation

This section reviews the key statutory elements of California's response planning for bioterrorism and briefly describes each piece of legislation. This aspect of response is critical to crisis management in that the statutes provide a basis for the criminal investigation of the incident. The statutes play several roles. First, they may serve as a deterrent to potential bioterrorists. Second, even though there are federal statutes governing bioterrorist incidents (see Annex 8), state-level legislation allows for the prosecution of perpetrators where federal law may be inadequate. Finally, such legislation is tangible evidence that California's policymakers are paying attention to the issue. One statute is in force, and three others are under consideration by legislators.

AB 140: *the Hertzburg-Alarcon California Prevention of Terrorism Act* was adopted by the Assembly and Senate in September 1999 and passed into law on January 1, 2000. This law makes it a crime for any person, with specified exceptions, to: possess, develop, manufacture, produce, transfer, acquire, or retain any type of chemical, biological, radiological, or nuclear weapon (i.e., a WMD); use a WMD against a person, animal, food or water supplies, crops, or public natural resources; threaten to use WMD resulting in an isolation, quarantine, or decontamination area; or attempt to develop WMD.

SB 611: *Biological Agents and Chemical Weapons*, was authored by Senator Richard Alarcon and is in inactive status in the Senate as of February 15, 2002. This bill would make it a felony, punishable by 15 years to life in state prison, for any person, without lawful authority, to: knowingly develop, produce, stockpile, transfer, acquire, retain, or possess any biological agent, toxin, or delivery system for use as a weapon; or to use a chemical weapon. This bill would also make it a felony punishable by up to ten years in state prison to threaten to commit a crime with a biological agent, toxin, delivery system, or chemical weapon.

SB 1298: *Funding for Domestic Bioterrorism Preparedness/Public Health Emergencies*, was authored by Senator Deborah Ortiz and was introduced on January 18, 2002. This bill would declare the intent of the legislature to identify federal and state funds that shall



be used for purposes of building the capacities of local health departments to prepare for and respond to public health emergencies. According to the legislature, the motivation for the bill is based on several factors. First, California's public health infrastructure is lacking in its ability to respond to biological threats or other emergencies. The system has been allowed to atrophy over the past several decades, leaving the public more susceptible to serious outbreaks of infectious disease. Second, threats of emerging infections and bioterrorism could be addressed more effectively with adequate funding infused into the public health system. Additional ongoing resources are needed to train additional public health staff, expand information and communication systems, and enhance public health laboratory capacity. Third, state and local public health departments require additional resources and funding to enhance their ability to respond to and prepare for future potential acts of biological terrorism or public health emergencies.

SB 1287, *Weapons of Mass Destruction* was authored by Senator Alarcon and was introduced on January 16, 2002. This bill would serve as an addendum of sorts to AB140. The additions would: expand the definition of WMD to include mass transportation vehicles under specified circumstances; penalize the use of WMD which damages not only persons, animals, food and water supplies, and natural resources (as AB 140 maintains), but also major infrastructure, landmarks, or economic activity; penalize the threatened use of WMD which results not only in an isolation, quarantine or decontamination area (as specified by AB 140), but also one that results in widespread fear, business closures, or transportation disruption; and make it a crime to possess or to expose any other person to a false or facsimile weapon of mass destruction, punishable in varying degrees. Under a different law, it is currently a crime to expose another person to a false conventional bomb.

### **Governor's Office of Emergency Services (OES) and California Terrorism Response Plan (CTRP)**

The OES has the lead for managing the consequences—preparedness, alert, warning, response, and recovery—of terrorism, including bioterrorism, at the state level. Reporting directly to the Governor, OES coordinates all aspects of terrorism response planning for the state government, including, in theory, for bioterrorism. According to OES, the FBI leads crisis management efforts and coordinates the law enforcement investigation with the support of state and local agencies. The FBI is responsible for the coordination of the federal government's response. State and local authorities have primary responsibility for consequence management, including treatment of casualties, rescue efforts, and community protection. In a terrorist incident, including bioterrorism, these decisions are made by a unified command that includes the FBI, local law enforcement and fire services, and public health authorities. In addition, OES maintains the California Specialized Training Institute (CSTI) in San Luis Obispo, which provides first responders with courses on emergency planning, preparedness, terrorism, hazardous materials, and other relevant topics.<sup>8</sup> OES and the CTRP are discussed in detail on page 8 of this report.

## **Emergency Medical Services Authority (EMSA)**

EMSA was created in 1980 and was charged with providing coordination and leadership in developing and maintaining emergency medical services (EMS) systems throughout the state, including managing statewide medical care systems and disaster medical response. In addition, EMSA assists OES with all EMS elements of the state's medical disaster plan. EMSA is responsible for responding to medical disasters and coordinating the mutual aid program.<sup>9</sup>

EMSA's emergency preparedness programs principally target first responders such as emergency medical technicians, paramedics, nurses, physicians, and administrators who provide medical care to the general public. Though the day-to-day EMS functions are carried out by local jurisdictions, EMSA has specific responsibility to: establish EMS training certification and licensing statewide; investigate and discipline first responders when necessary; encourage EMS improvements statewide; coordinate disaster planning statewide, including for terrorism; provide general standards for EMS operations statewide; and develop and maintain data systems.

In addition, EMSA coordinates California's Disaster Medical Assistance Teams (DMATs). DMATs are part of a national network of response teams composed of civilian volunteers from the medical health professions. As a component of the National Disaster Medical System (NDMS), DMATs are partly funded by the federal government and constitute an important element of a cooperative asset-sharing program among federal agencies. Though primarily a state asset under EMSA, DMATs can be federalized and activated to provide supplemental or replacement medical care and other services to communities impacted by a disaster.

Of the more than 20 DMATs nationwide, seven have their headquarters in California: Los Angeles, Orange County, Sacramento, San Bernardino, San Diego, San Francisco, and a Mental Health Specialty team in Southern California.

## **California Department of Health Services (DHS)**

Under the coordination of OES and the State Emergency Plan, DHS is charged with the responsibility for coordinating statewide disaster public health assistance in support of local operations. DHS has primary responsibility for public and environmental health operations and has a major supporting responsibility to EMSA for disasters involving mass casualties.

DHS is mandated with the responsibility to develop and maintain the Joint Emergency Operations Center (JEOC) which, in a major disaster, acquires medical and public health supplies, equipment, and personnel as needed to support the disaster medical response under the statewide medical/health mutual aid system. The JEOC also serves as the central point for coordination of the Department's emergency response and recovery activities, information, and resources. With specific regards to bioterrorism DHS has the responsibility to: ensure the safety of public water supplies; provide public health laboratory services to assist state and local agencies as requested; provide surveillance,

prevention, and control of infectious diseases; in coordination with federal, state, and local agencies and other researchers, conduct epidemiological investigations as appropriate to assess the impact of the emergency on public health; ensure that Medi-Cal beneficiaries and DHS-funded primary care clinics impacted by the disaster have the coordination and assistance needed; provide emergency supplies of “death certificates” and “permit for disposition of human remains” forms and training in their use; and provide personnel on request to assist the Department of Social Services at the Disaster Application Centers or to assist OES or other state or local agencies as appropriate.

DHS also maintains the Emergency Preparedness Office (EPO) under coordination of the Environmental Management Branch (EMB). The EPO carries out a large portion of DHS responsibilities such as: coordinating the 24-hour duty officer program to ensure that the department is prepared to respond to public health emergencies; representing DHS to OES, EMSA, U.S. Public Health Services, FEMA, and other state, federal, and local agencies; planning for and ensuring that DHS staff receive training in emergency programs and participate in emergency exercises; planning for the JOEC and the DHS Emergency Coordination Center (ECC); reviewing the emergency communications needs of the automated highway system (AHS) programs;<sup>10</sup> acting as liaison to DHS emergency radio stations; arranging for emergency identification for DHS employees who will need to enter the disaster area; maintaining communication with all DHS programs with emergency responsibilities and consulting them as requested; updating the DHS Emergency Plan and Procedures annually; activating the JEOC and/or the ECC when appropriate; ensuring that any emergency information from OES is disseminated to the appropriate agencies or people; acting as liaison between the DHS Executive Staff and the Emergency Operations Center; facilitating post-disaster cost recovery activities in coordination with the Financial Management Branch; and coordinating the preparation of after-action reports and recommendations by all DHS programs that respond to the disaster to ensure that lessons learned from the response are incorporated in the department’s emergency plans and procedures.

In late 2001, the DHS’ Licensing and Certification Program and Division of Communicable Disease Control led an effort to develop the California Hospital Bioterrorism Response Planning Guide;<sup>11</sup> the other agencies that participated were the EMSA and OES. The overall objective of the Planning Guide is to “assist hospitals in preparing for a possible bioterrorism event.” It has three primary sections: (1) overview of bioterrorism and roles of hospitals in managing emergency biological events; (2) detailed descriptions of the bioterrorism agents identified by the CDC; and (3) attachments that specify such practical details as a communication plan, forms for medical records review, charts with disease syndromes, and a list of text and Internet references on bioterrorism. A draft of the Planning Guide was released in October 2001 for review by interested parties, which was to have been completed by November 30, 2001. As of this writing, the final Planning Guide was not available.

## **California Master Mutual Aid Agreement**

Signed in 1950 by California's incorporated cities and all 58 counties, the agreement ensures that cities, counties, and/or the state join together to provide voluntarily additional resources to local jurisdictions whenever local-level resources are over-committed or inadequate. In an emergency, local jurisdictions would always retain control of their resources and/or personnel, but would give and receive help as needed. Emergency assistance provided through the agreement includes, but is not limited to, medical assistance, fire emergency assistance, evacuations, ambulance services, law enforcement, coroner services, and search and rescue systems.

To facilitate the coordination and flow of mutual aid, the state has been divided into six regional offices throughout California under OES. In addition, a state or local coordination center within or near the affected area may be activated to help coordinate the response pertaining to the agreement. This would include designating one or more support areas where resources can be received, stockpiled, allocated, and delivered to the appropriate locations.

## **Civil Support Teams (CSTs)**

The CSTs were established to respond to a WMD incident by: 1) determining the nature of an attack (or incident); 2) providing technical advice on response operations; and 3) supporting the arrival of state and federal military response assets. There are two CSTs in California, both of which consist of at least 22 highly trained, full-time members of the Army or Air National Guards. One CST is located in Hayward and serves Northern California, while the second is in Los Alamitos and serves Southern California.

Of the 32 teams nationwide, 24 have completed their training and are certified to be fully operational. They have also received sophisticated equipment including mobile analytical laboratories for field analysis of chemical or biological agents and unified command suites that have the ability to provide communications interoperability among the many first responders that may be on scene. As of January 2002, both of California's teams had been certified and were operational.

Though the CSTs are funded, trained, and evaluated at the federal level—and even operate under federal doctrine—they perform their mission primarily under the command and control of the governors of the states in which they are located. Operationally, they are under the command of the adjutant generals of the individual states and therefore comprise part of the state response.

## **LOCAL AUTHORITIES**

This section lists the key players at the local level and describes their role in a bioterrorist response. In an overt bioterrorist event, the response at the local level would look similar to a response to a hazardous materials incident, and the local IC (usually a fire

department official) operating within a unified command structure as defined by the ICS would be in charge of the response. Local jurisdictions in some cases have developed step-by-step response guidelines that follow CDC and FBI recommendations. However, often the threat credibility assessment element of the guidelines is left to the FBI.

### **Metropolitan Medical Response System (MMRS)**

The Metropolitan Medical Response System, formerly called the Metropolitan Medical Strike Teams, was created in 1996 and is managed by the Office of Emergency Preparedness (OEP) of the U.S. Department of Health and Human Services (DHHS). The primary focus of MMRS is to develop or enhance existing emergency preparedness systems to manage a WMD terrorist incident, including a bioterrorist event. Through a contractual relationship with the federal government, the goal is to coordinate the efforts of local law enforcement, fire, HAZMAT, EMS, hospital, public health and other personnel to improve response capabilities and to ensure that the medical response system overall is prepared for a WMD terrorist attack. By the end of year 2002, 120 jurisdictions across the United States will have implemented MMRS plans in their communities, including 18 in California: San Jose, Los Angeles, San Diego, and San Francisco (1997); Long Beach, Oakland, and Sacramento (1999); Fresno, Santa Ana, Anaheim, and Riverside (2000); Stockton, Huntington Beach, and Glendale (2001); and Bakersfield, Fremont, Modesto, and San Bernardino (January 2002).

In general, MMRS is designed to: focus on immediate site-specific response capability; enhance existing capabilities; develop overall systems plans; raise awareness of WMD agents; develop enhanced capability to operate in contaminated environments; develop specialized treatment protocols for WMD victims; integrate biological preparedness into the overall planning process; develop plans for mass prophylaxis of exposed and potentially exposed populations; develop plans for mass patient care; develop plans for mass fatality management; and develop plans for environment surety. In order to achieve these goals, the MMRS will maintain the following capabilities: ability to conduct initial identification of agents; ability to perform operations in OSHA levels A, B, and C personal protective equipment avoiding secondary responder casualties; capabilities to implement enhanced triage, treatment, and decontamination capabilities at the incident site and definitive care facilities; maintenance of local caches sufficient to treat 1,000 patients exposed to chemical agents; ability to transport "clean" patients to area hospitals for definitive care; ability to maintain a viable health system; ability to transport patients to participating NDMS hospitals throughout the nation; maintenance of mechanisms to activate mutual aid support from federal, state, and local emergency response agencies; and ability to integrate additional response assets into the ongoing incident command structure.

At the local level, the program is unique in that it: requires development of response plans unique for each city; creates integrated immediate response structure; creates additional local and regional support network; brings together response systems of surrounding jurisdictions in the planning process; integrates with local mass-casualty response plans; brings together and encourages city planning agencies to interact in the planning process at a level where they are not usually involved; encourages and initiates

hospital nuclear, biological, and chemical planning; creates an interface between primary care providers and the public health community; and encourages local healthcare providers to develop appropriate medical treatment protocols.

### **Local Public Health Departments**

California is comprised of 58 counties. However, in matters concerning public health, there are 62 public health departments: 55 county, three city and county (Napa, San Francisco, and Siskiyou), and four city health departments (Berkeley, Pasadena, Long Beach, and Vernon). Should a bioterrorist attack occur in California, the government of the affected county, and/or city, would be responsible for instituting ICS and appointing the IC. Under California law, during a declared state of emergency or local emergency, local public health officers are granted widespread authority to take “any preventive measure that may be necessary to protect and preserve the public health from any public health hazard during any ‘state of war emergency,’ ‘state of emergency,’ or ‘local emergency.’”<sup>13</sup> If humans were to be the target of an attack, the county or city public health departments, and their health officers, would be in charge because they are the first line of defense in all matters affecting public health. If animals or plants were the target, the affected county’s department of agriculture would be in command.

In case of human diseases, California’s 62 local health departments’ network of laboratories is available for diagnostic testing of samples taken from humans. The “flagship” state-of-the-art public health reference laboratory was opened in April 2001 in Richmond. If animals or plants were affected, samples would be analyzed at one of the five laboratories belonging to the California Animal Health and Food Safety Laboratory System (located in Davis, Fresno, San Bernardino, Tulare, and Turlock), which is administered by the School of Veterinary Medicine, University of California, Davis.<sup>14</sup> In addition, San Diego County operates its own veterinary laboratory.

Were a major health event to take place, whether of natural etiology or resulting from a bioterrorist attack, most cities that have their own health officers probably would cede authority to the county health officer. Were a county government to declare a “local emergency,” this status would apply to all cities in that county. Were more than one county to be affected by a human disease outbreak, the OES would become the lead coordinating agency in the response. Counties would assist one another according to the California Master Mutual Aid Agreement.

Although the DHS provides guidance and advice to the local departments when requested, it can intercede and take control of the public health aspects of a response, which would likely take place in the context of OES coordination. This could occur as a result of the Governor proclaiming a state of emergency over any city or county. While only the Governor is empowered to issue such a proclamation, a city mayor can request that such a declaration be made by the Governor.

Most, if not all, California counties and major cities are aware of the threat of WMD terrorism and have made or are making plans to meet it. According to the California State Association of Counties (CSAC), this is placing a heavy financial burden on county

governments; a burden that will grow. Thus, the CSAC estimates that California counties spent \$90 million above anticipated budgetary expenses during the fiscal year 2001-2002, and estimates that an additional \$500 million will be spent for this purpose in the immediate future. The CSAC claims that these “needed funds would be used on such activities as security for key public facilities, public safety and fire services, hazardous materials response, county hospitals, public health information and emergencies, and information technology and communications systems.”<sup>15</sup>

It is not possible here to discuss the various initiatives by county and state governments to address WMD terrorism. A quick review of the county government Internet home pages listed by the CSAC indicates that most of them have written information sheets on bioterrorism.<sup>16</sup> But special note should be made of a fine information packet for physicians prepared by the County of Santa Clara a year before the events of autumn 2001.<sup>17</sup>

### **Local Metropolitan Area Efforts**

Some California metropolitan areas have developed multi-jurisdictional groups to address the emerging terrorist and bioterrorist threats. The Los Angeles Task Force on Terrorism (LATFOT), and the San Francisco Counter Terrorism Task Force (SFCTTF) are working groups composed of police officers and intelligence analysts that seek to provide early warning of terrorist threats. Threat analysis and credibility determination are parts of this primarily law enforcement responsibility.

In addition, the Bay Area Terrorism Working Group (BATWG) and Los Angeles County Terrorism Early Warning Group are designed to involve officials from law enforcement, fire services, public health, local governments, non-governmental organizations, and others. These groups provide a mechanism for members of different segments of the response community to meet each other, interact regularly, and more effectively respond to the bioterrorist threat.

### **FEDERAL AUTHORITIES**

This section outlines the key federal assets available to California during a response to bioterrorism.

#### **Office of Homeland Security (OHS)**

The OHS, responsible for developing and coordinating a comprehensive national strategy to address the threat of terrorism, maintains a Special Advisor on State Security in Sacramento to serve as liaison between the Assistant to the President for Homeland Security and the California Governor.<sup>18</sup> This advisor advises the Governor on antiterrorism efforts in California and coordinates with local and state agencies to fulfill California’s antiterrorism needs.<sup>19</sup>

## **Nunn-Lugar-Domenici Domestic Preparedness Program**

The Defense Against Weapons of Mass Destruction Act of 1996, or Nunn-Lugar-Domenici amendment to the National Defense Authorization Act for FY 97, called for the implementation of a training program for first responders to deal with WMD terrorist incidents.<sup>20</sup> This program, generally known as the Nunn-Lugar-Domenici Domestic Preparedness Program, which commenced in 1997, provides first responders throughout the nation—fire, police, emergency medical technicians, and others—with a series of training exercises, courses, and equipment designed to help them to prepare for WMD terrorist incidents. Training includes classroom overviews of WMD materials and terrorism; chemical training functional exercises; and biological terrorism tabletop exercises.

The Department of Defense implemented this program until October 2000, when program management and implementation authority was transferred to the Department of Justice in an effort to build more flexibility into the program. The California cities that have received Nunn-Lugar-Domenici funding are Anaheim, Bakersfield, Fremont, Fresno, Glendale, Huntington Beach, Long Beach, Los Angeles, Modesto, Oakland, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Jose, Santa Ana, and Stockton.

## **Centers for Disease Control and Prevention (CDC)**

The CDC serves as a consultant for California's DHS as well as for other related agencies at both the state and local levels. Through programs such as the Epidemic Intelligence Service (EIS) Program and the National Center for Health Statistics, the CDC provides information and analyses to state and local governments to help them develop appropriate policies and response guidelines. In addition, the CDC is charged with leading a nationwide preparedness training and education program for state and local health care providers, first responders, and governments. Since the anthrax letter attacks in fall 2001, the CDC has committed to increasing its efforts to strengthen local and state capacities to deal with the growing threat of biological terrorism.

An important element in the relationship between the CDC and California is the CDC's National Pharmaceutical Stockpile (NPS) Program. In the event of an outbreak of disease—from terrorism or natural causes—the Governor can make a formal request to the Director of the CDC that medicines, vaccinations, and/or other NPS assets be sent. Once requested, the CDC Director has the authority, in consultation with the Surgeon General and the Secretary of Health and Human Services, to order the deployment of the materials. If deployed, the materials would be accompanied by CDC technicians, who would serve in an advisory role to state or local authorities to ensure that that NPS assets were put to prompt and effective use. Theoretically, as part of the aforementioned training, the CDC would have already informed state and local officials of the important issues they must plan for in order to receive NPS assets during such a crisis. If the federal government ships supplies from the NPS to a local authority, that authority has responsibility for unloading those supplies at the airport and transporting them to the appropriate site.



## **Federal Bureau of Investigation (FBI)**

As discussed above, the FBI is responsible for coordinating all aspects of the federal response to an incident and is the lead federal agency for crisis management. Local FBI WMD Coordinators in FBI Field Offices work with local officials in this capacity.

## **Federal Emergency Management Agency (FEMA)**

As discussed above, FEMA is the lead federal agency for consequence management. FEMA serves in this capacity through its regional representation; California is in FEMA Region IX.

## **NON-GOVERNMENTAL ORGANIZATIONS**

In addition to the agencies and organizations described above, several other entities have roles in bioterrorism response. The San Diego County Medical Society developed a “Primer on Bioterrorism” for physicians in San Diego County. Such documents allow front-line responders, such as primary care doctors, access to bioterrorism information.<sup>21</sup> Training courses, such as the Planned Response Exercises and Emergency Medical Preparedness Training designed by the American Academy of Emergency Physicians, offer classroom and functional coursework in bioterrorism response. Numerous such training programs exist nationwide.<sup>22</sup>

In addition, the University of California Los Angeles (UCLA) Center for Public Health and Disasters has received a grant from the state to develop a curriculum for bioterrorism training for health care professionals. The program addresses physicians and clinicians in the field, the public health community, and others, in a public health curriculum. The training is available through the Center’s web site.<sup>23</sup> The Stanford Medical Center has developed a model bioterrorism response plan for hospitals that has two objectives - to ensure the health and proper treatment of the patient and to limit the potential exposure of medical staff and facilities. This plan, which has general applicability to any hospital, is updated frequently taking into account new developments at the CDC and input from public health providers.<sup>24</sup>

On the non-medical side, the Center for Nonproliferation Studies (CNS) at the Monterey Institute of International Studies has developed a database containing information from worldwide sources on WMD terrorist events from 1900 to the present. This database is probably the largest in the unclassified environment. In addition, CNS researchers perform advanced policy research on biological and chemical warfare and terrorism issues, the findings of which have applications at all levels of policymaking.<sup>25</sup> The RAND corporation, which possesses extremely advanced analytical capabilities, published an important study on bioterrorism<sup>26</sup> in 1989, and continues its involvement in WMD terrorism studies as demonstrated by its recent publication of a report of direct relevance to California.<sup>28</sup> Finally, the BW Working Group, organized by the Center for International Security and Cooperation at Stanford University, possesses unsurpassed knowledge of biological warfare and terrorism in the San Francisco Bay region.<sup>29</sup>

## ROLE SEQUENCING OVER TIME

This section describes and discusses the changing or evolving roles and responsibilities of key agencies and organizations listed in the CTRP for preparedness, response during the event itself, and the management of the event's consequences.

When reviewing the roles of the various agencies, organizations, and entities involved in bioterrorism preparedness in California, it is helpful to look at the timeline for response for each of the key players. Having an understanding of how different roles overlap is critical to ongoing policymaking efforts. The government's goal should be to minimize unnecessary overlap while building sufficient flexibility and redundancy into the system.

Although many plans exist for dealing with WMD terrorist threats in California, a great deal of local and state preparedness efforts are biased towards chemical/HAZMAT and conventional attacks. This predilection towards planning for certain types of incidents may be partly the result of federal WMD preparedness planning and programs that reflect similar biases. Perhaps because it is simply easier to plan for managing chemical/HAZMAT and conventional attacks, planning has focused primarily on them. In such incidents, there is an identifiable area that is affected, there is a sentinel event, or "bang," and the event has a relatively clear beginning and end. Although the use of secondary devices may complicate the situation, planning for these types of events is comprehensible in that the event follows predictable patterns.

Planning for bioterrorism is not as straightforward. If the incident is perpetrated overtly, it may have some of the same characteristics as a more traditional conventional terrorist or even chemical incident. For example, an aerosol device placed in a public area could attract enough attention to determine that a bioterrorist incident had occurred. The anthrax letter attacks in fall 2001 are also of this type—letters containing the pathogenic spores arrived, announced that an attack was taking place, and identified the pathogen involved. Given all of the possible manifestations of bioterrorism, the anthrax letters were relatively easy to handle. With the exception of the sentinel case of inhalation anthrax diagnosed by a particularly observant doctor in Florida, these attacks, though unprecedented, played out much like HAZMAT events.

A much more difficult and ominous potential bioterrorist threat involves the covert release of a pathogen. In this case, there is no "bang" and no identifying event. If the delivery is successful, the attack will manifest as a disease outbreak, likely a flu-like syndrome or gastrointestinal distress. At this point it is up to health care professionals to determine that a bioterrorist incident has occurred by accurately diagnosing the agent, having a high suspicion level for certain aspects of the disease outbreak, and suspecting bioterrorism.

In order to understand these issues related to a covert attack, it is useful to examine the response of the key players at each stage of the bioterrorist attack as outlined in Annex 5. This discussion is diagrammed on the sequencing timeline in Annex 6. Before the decision is taken to perpetrate a bioterrorist incident, every agency is responsible for maintaining its preparedness for an attack. This continues through the preparation stage

prior to an attack and until casualties begin to appear. This scenario assumes a relatively high number of casualties. At this point, public health departments, hospitals, DHS, and the California Master Mutual Aid Agreement would be involved. Diagnosis of the disease outbreak would require the participation of the public health laboratory system and possibly the CDC. Once the epidemiological investigation and/or diagnosis of a specific disease highly correlated to bioterrorism (see Annex 5) had determined the etiology to be non-natural, several other agencies would become directly involved. The FBI would coordinate the federal response to the crisis management aspects of the incident; FEMA would coordinate the federal consequence management response; the CSTs would be available for support; MMRS would be engaged; and DHS and public health would continue to be involved. Throughout, OES would be working closely with all agencies involved, including the liaison to OHS, and EMSA would continue to coordinate all EMS aspects of the medical response.

During the casualty presentation stage, in the event of the use of a contagious agent, it might be necessary to quarantine people who might have been exposed. The operation and enforcement of quarantine would require assistance from public health and law enforcement agencies, which would continue throughout the event. During this stage, triage, treatment, and disposition of casualties would occur involving primarily public health, DHS, and supporting agencies. Because medical records and tissue and blood samples could possibly be evidence for the criminal prosecution of the perpetrators, chain of custody of such potential evidentiary material would require law enforcement involvement.

At the end of the event, at the point of resolution, the response would be scaled back to pre-attack preparedness. Lessons from the response could provide valuable insight to future planning efforts. Efforts to apprehend, convict, and incarcerate the perpetrators would, of course, continue as long as necessary.

## **RECOMMENDATIONS TO IMPROVE BIOTERRORISM PREPAREDNESS IN CALIFORNIA**

This five-week study provides a starting point for policymakers in understanding the complexities of California's response to the bioterrorist threat. However, only a longer, more in-depth study, utilizing a substantial number of primary-source interviews, can provide a basis for a solid analysis and assessment of the nature, extent, and effectiveness of California's response, as well as an easily accessible list of the many public and private sources of anti-terrorism training. The State should consider undertaking such a study, which could be carried out over an eight- to 12-month period, as follow-on to this initial effort.

Based on this study's analysis of the SEMS, CTRP, and agency responsibilities, two sets of recommendations emerge pertaining to response planning and long-term study of bioterrorism.

### **BIOTERRORISM RESPONSE PLANNING**

The implications for emergency planning and response would be similar, whether the etiology of a biological event was an infected airplane passenger arriving at LAX or SFO from Africa or Asia and carrying exotic pathogens, terrorists wielding biological weapons, a disgruntled microbiologist retaliating against her or his employer for an alleged wrong, criminals attempting to extort money from a company by threatening or effecting product tampering using pathogens or toxins, or a human infected with a contagious virus circulating among riders of an underground railway. Further, the management of the emergency brought about by a biological event will be much the same, whatever its etiology. Whether a large number of pathogens were brought into the state by an infected individual, escaped a laboratory by accident, or were deliberately transported to a selected site by terrorists and dispersed there, would make little practical difference to the health providers and the EMDs who receive the onslaught of sick victims. In each instance they would have to treat casualties along empirical lines until a tentative diagnosis could be made, at which time treatment could be made more specific. Soon after the extent of the biological emergency becomes clear, public health officials would undoubtedly begin their work to identify the causative agent; attempt to limit its spread by instituting public health measures, including quarantine if the suspected agent is contagious; protect the affected and nearby population by, as appropriate, antibiotic therapy, vaccination, decontamination, the provision of personal protection gear, and evacuation; and, eventually, to restore conditions to what they were before the event occurred. This being the situation, it would be best to deal with every sizeable disease outbreak as a public health event, to be addressed by preplanned medical and public health measures. If the biological event under consideration was an epizootic or plant disease outbreak, the same considerations apply, except that preplanning would be done by veterinarians or plant pathologists and people with expertise in these disciplines would be the first responders.

The CTRP is, as its name suggests, a plan to address the threat of terrorists armed with WMD. However, because of their obvious characteristics, nuclear and chemical terrorist

attacks would without doubt be quickly recognized for what they are. This is not necessarily so with a biological terrorist attack. Of course, a future bioterrorist attack might be similar to those carried out in September and October 2001 with letters carrying anthrax spores, in which case it would be almost immediately identified as such, and the police would be alerted. Or, an aerosol attack utilizing *Bacillus anthracis* spores might be mounted, in which case it would be quickly recognized as a terrorist attack. However, it is more likely that future biological attacks will utilize food-borne or beverage-borne pathogens, or an individual infected with a contagious virus, in which case its etiology probably would not be immediately recognized. In view of these possibilities, there is a need for the state of California to build on the basis provided by the CTRP in two ways. First, there is a need for SSCOT, augmented as needed by expertise from the public and private sectors, to draft a new annex to the State Emergency Plan called "California Response Plan to Criminal Use of Pathogens." By using the term "criminal," we recognize that biological mayhem may be caused by persons who have motives other than those commonly ascribed to terrorists; for example, a person or persons may employ biological weapons for economic reasons, to extract revenge against rivals, or for demented purposes. And as we stress throughout this report, this response plan should have well-developed sections on responding to biological attacks against human, animal, and plant populations.

Second, there is a need to recognize the possibility of terrorist events affecting public health in California. In other words, in its attempts to secure an adequate level of public health in California, DHS must take into account the threat of bioterrorism. According to the Health and Safety Code § 120125, DHS is "required to determine causes, incidence, and distribution of communicable diseases in human and domestic animals which affect the public health." It adopts and enforces rules and regulations for such purposes according to Health and Safety Code § 100275. Under these statutes, DHS certainly has the responsibility for planning to meet the threat of bioterrorism, which could employ communicable diseases in such ways as to negatively affect public health in California. However, it is difficult to comment on this subject at the present time since DHS is taking action in this area. On January 7, 2002, DHS held public hearings on the subject of "Disease Reporting to Assess Potential Bioterrorist Events."<sup>30</sup> It is sufficient to note that, for reasons explained above, public health planning to address the consequences of an infectious disease outbreak ought to include provisions that would guide actions of health providers and public health officials should the event prove to be the result of terrorist or criminal action. For example, doctors, nurses, and public health investigators usually do not concern themselves with such matters as gathering evidence, maintaining a proper chain of custody for evidential materials, making records of possible criminal activity, etc. While they might be reluctant to take on these tasks, given the tension that often exists between police and EMD staff, these kinds of activities have become necessary due to the heightened probability that microbiology will be used for illicit purposes.

## **LONG-TERM STUDY OF BIOTERRORISM**

In this time of heightened concern about terrorism, California appears to have many vulnerabilities that could be taken advantage of by terrorists. In addition, its biotechnology industry is second to none in the world, which means that knowledge and

expertise of possible relevance to biological weapons and terrorism is readily available in California. These ingredients, as well as others that need not be mentioned here, call for a better understanding of the risks relevant to the criminal and terrorist use of pathogens and toxins. Therefore, California should act quickly to establish a Center for Bioterrorism and Public Health Research (CBPHR).

Two centers similar to the one proposed here already exist in the U.S.; the Center for the Study of Bioterrorism and Emerging Infections at the Saint Louis University School of Public Health, St. Louis, Missouri,<sup>31</sup> and the Center for Civilian Biodefense Strategies at the School of Hygiene and Public Health, Johns Hopkins University in Baltimore, Maryland.<sup>32</sup> In addition, a new Center on Bioterrorism is about to be established in New York.<sup>33</sup> As with the New York center, pilot funding for its establishment can be sought from indigenous foundations and industry. If well developed, center administrators could approach federal agencies for larger amounts of money to pay for projects. It is critical that California's government and leadership utilize the vast resources available in the academic and non-governmental organization (NGO) communities for understanding and responding to bioterrorism.

The CBPHR should not duplicate the activities of other centers; rather, it would concentrate on terrorism and infectious disease issues of importance to California and, by extension, the Pacific Rim. Due to the importance of agriculture to California (and the U.S.), the CBPHR should expend at least 50 percent of its efforts on animal and plant diseases, something the other centers are not doing. In general, we would hope that the CBPHR would take the following responsibilities: act as a resource to SSCOT and, if need be, S-TAC; act as a liaison between the state agencies and the state's private medical institutions, schools of public health, veterinary schools, and medical schools; serve as a liaison between California institutions and institutions in neighboring states and nations; set up consultative bodies in human, animal, and plant health that could be assembled and transported to any site within the state experiencing a disease outbreak within three hours; perform strategic assessments of the state's medical, public health, veterinary, and plant pathology resources to meet biological attacks; and perform strategic assessments of the state's vulnerabilities and how to eliminate or diminish them, and carry out directed projects to address special problems or situations.



## **ACKNOWLEDGEMENT**

The authors give special thanks to Mr. Tim Ballard, Research Associate at the Monterey Institute, for providing superb research assistance throughout this project.





## **ANNEX 1**

### **CALIFORNIA TERRORISM RESPONSE PLAN:**

#### **Purpose, Scope, and Objectives (as Shown on Page 1 of the Plan, Available From <http://www.oes.ca.gov>) and Organizational Chart**

##### **Purpose**

The purpose of this plan is to support the State of California's public policy of preparing for, and responding to, any and all threats to the safety of its citizens. The specific focus of this plan is to address potential and actual terrorist events. It augments California's State Emergency Plan (SEP) which guides California's overall preparation for and response to emergencies and disasters. State and local agencies can use this document to assist them in their planning activities.

##### **Scope**

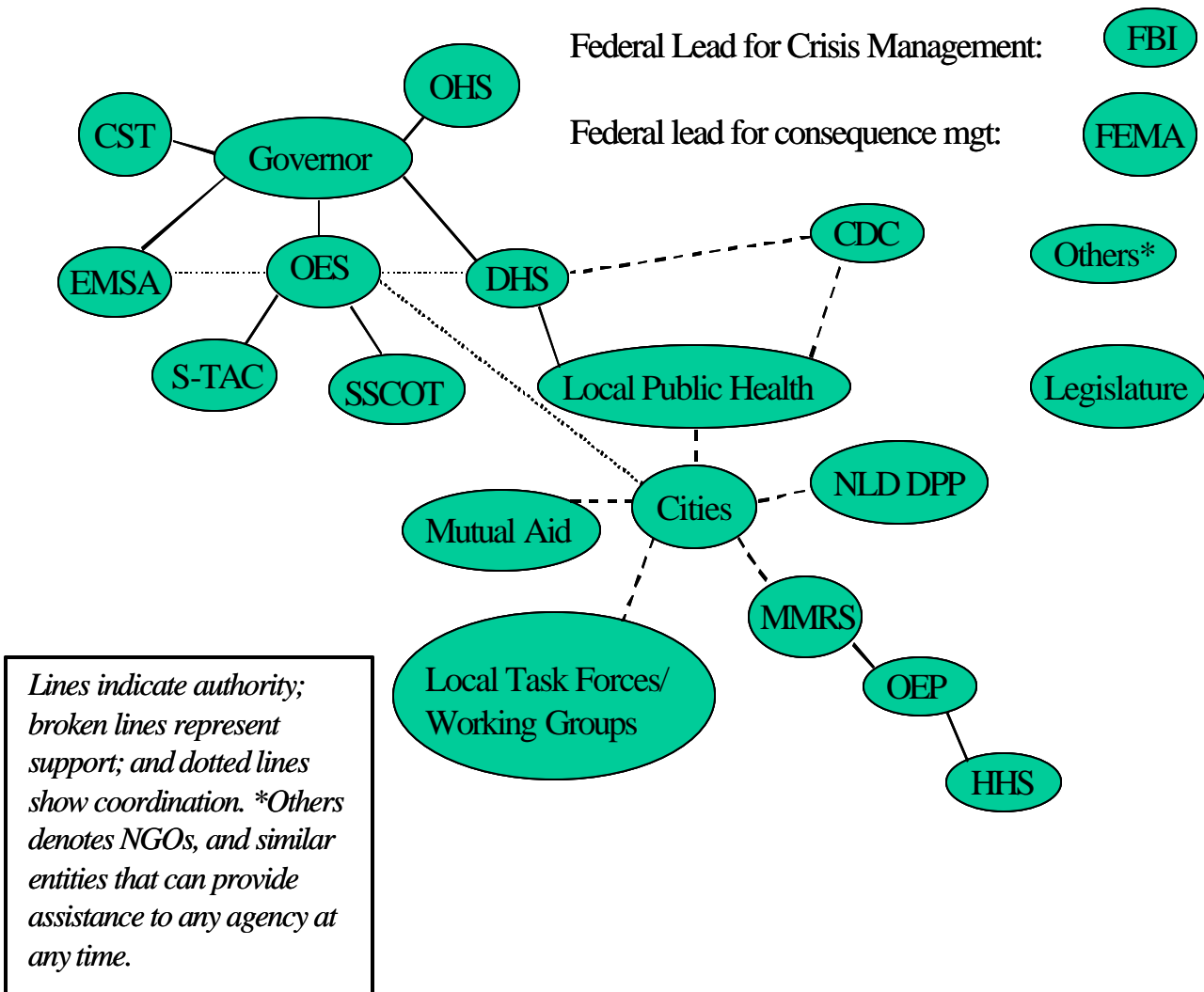
This plan provides direction to state agencies and local governments within California involved in protecting public safety, and preparing for and responding to terrorist events. It is intended as reference information for federal agencies and is intended to clarify the roles and relationships of agencies at the state and federal levels of government in dealing with the threat or actual occurrence of terrorist events in California.

##### **Objectives**

The objectives of this plan are to:

1. Provide a vehicle for establishing and maintaining a current and realistic assessment of the potential threat of terrorism in California.
2. Outline the roles, responsibilities, and capabilities of state and federal agencies in preparing for and responding to terrorist events.
3. Provide planning, response, and recovery guidance which is consistent with California's Standardized Emergency Management System (SEMS) and the President's policy on terrorism (Presidential Decision Directive-39).
4. Provide a basis for identifying needed training of personnel and exercising of local, state, and federal capabilities for responding to terrorist events.

## Organizational Diagram of Key Bioterrorist Response Agencies



## ANNEX 2

### FOUR CASES OF BIOLOGICAL TERRORISM

A search of the Monterey WMD Terrorism database revealed that out of 383 incidents in which biological, chemical, nuclear, or radiological agents were used by criminals or terrorists during the time 1900-present, only 77 biological “events” (i.e., episodes involving the deliberate use of a biological agent to harm people) were perpetrated. Of these, just five generated more than ten casualties. Four of these cases have relevance to this report.

Bioterrorist attacks have been mounted by: (1) the Rajneeshees cult in 1984; (2) the Aum Shinrikyo cult during 1993-1995 in Japan; (3) an individual who attacked a laboratory in Texas in 1996; and (4) unknown perpetrator(s) who in September and October 2001 sent letters containing *Bacillus anthracis* spores. A synopsis of each is presented here.

#### The Rajneeshees

A religious cult led by the Bhagwan Shree Rajneesh and originating in India attracted thousands of adherents throughout Europe and the U.S. in the 1970s. In 1981, the cult purchased a property adjacent to the town of The Dalles, the county seat of Wasco County, Oregon. As it grew, the cult transgressed both state and county land-use laws and in general antagonized the population of Wasco County. In order to create a more favorable legal and political environment for itself, the cult’s leadership decided to try to take control of the Wasco County commission in the November 1984 election. Since this could not be done by legitimate means, the cult’s local leader, Ma Anand Sheela, decided to sicken Wasco County voters so they would be unable to vote. One of Sheela’s underlings, Ma Anand Puja, a registered nurse, learned sufficient bacteriology to realize Sheela’s idea. She purchased a seed culture of *Salmonella enterica* serotype *typhimurium*, a common cause of food poisoning, and propagated this pathogen in a laboratory set up for this purpose. In September 1984, cult members contaminated the salad bars of ten restaurants and one supermarket with their *Salmonella* concoction, which caused 751 persons to become ill; of which 45 required hospitalization.<sup>34</sup> The outbreak ended October 1, 1984. It was the largest *Salmonella*-caused outbreak in Oregon’s history. Initially, Oregon public health officials believed the outbreak to have had a natural etiology;<sup>35</sup> it was not until about a year later that a Rajneeshees member confessed its true cause.

#### The Aum Shinrikyo Cult

The Aum Shinrikyo cult was founded in 1987 by Shoko Asahara. Its membership grew rapidly, reaching over 40,000 by 1995. Among its members were highly trained scientific and technical people, including molecular biologists, chemists, and physicians. It became wealthy because members donated vast amounts of money to it; in addition, the cult operated a wide variety of businesses. Estimates of how much it was worth vary, but in its heyday it might have been as much as \$1 billion.<sup>36</sup>

While the Aum Shinrikyo is most infamous because of its sarin attack on the Tokyo subway, its violent activities predate this event. Its leader, Shoko Asahara, was fascinated by both chemical and biological weapons. In fact, the cult's scientists produced and used its first biological weapon, which was based on botulinum toxin, in 1990. In 1993, it expanded its biological arsenal by acquiring weapons based on *Bacillus anthracis*. All in all, between 1990 and 1995, the cult carried out 20 chemical and biological attacks in various cities in Japan; of these, six used botulinum toxin and four used *B. anthracis*.

The first attack occurred in April 1990. Aum members rigged up a truck so it contained a spraying system in the rear compartment. This truck was driven around the government office quarter of Kasumigaseki, headquarter buildings of several religious groups, and the U.S. Navy base in Yokosuka while a solution containing botulinum toxin was dispersed. No casualties resulted. During the summer of 1993, the cult used three sprayer-equipped trucks to disseminate *B. anthracis* while driving around the Diet building, Imperial Palace, and the Tokyo tower. As with its other attempts at waging bioterrorism, the Aum Shinrikyo failed.

It is still not entirely clear why Aum's biological weapons did not work. Evidence presented at the trials of Aum members indicate that Aum's scientists had secured a strain of *Clostridium botulinum* that did not produce botulinum toxin and a non-virulent strain of *B. anthracis*. There were also problems with the mechanisms used to disperse these agents.<sup>37</sup> If this evidence is correct, it can be seen that the failure of the Aum Shinrikyo's biological attacks was not due to a lack of will by the cult's leadership, but to technical barriers. It is interesting to note that the Aum Shinrikyo was unable to overcome these technical barriers despite having members with advanced training in the biological sciences who worked in well-furnished, well-equipped laboratories.

It bears mentioning that in the chemical area, the cult mounted at least ten attacks. Thus, they used sarin on five occasions, VX on three, and hydrogen cyanide on two. Of the Aum's chemical weapons attacks, two were serious in terms of generating casualties. The first was directed against a judge who was believed to be ready to act against Aum interests in a land dispute. In June 1994, Aum operatives released sarin from a rented truck as it was driving by a building where the judge was working. Seven persons were killed by the gas and an additional 150 people, including the judge, were injured.<sup>38</sup>

The second attack generated mass casualties. Members of the Aum Shinrikyo cult had placed packages containing sarin nerve gas on five subway railroad cars belonging to three separate lines during morning rush hour. The cult operatives were ordered to affect the release of the gas at a subway convergence point beneath Japanese government ministry offices. Eventually, the attack caused over 5,000 persons to seek medical attention; of these, 12 died.

### **Biological Event in Dallas, Texas**

On October 29, 1996, between the night and morning shifts, someone placed doughnuts and muffins in the employee break room of the St. Paul Medical Center in Dallas, Texas.

Shortly thereafter, an anonymous email was sent to employees of the center's laboratory from an unoccupied supervisor's office, informing them of the availability of these pastries. Of the 45 laboratory workers who received this message, 12 ate at least part of one pastry. All of them contracted severe gastrointestinal disease, which was found to have been caused by the food-borne pathogen *Shigella dysenteriae* Type 2. In four victims, the disease was sufficiently virulent to require hospitalization, but there were no fatalities.<sup>39</sup>

Approximately two years later, on September 11, 1998, a former laboratory employee, Diane Thompson, pleaded guilty to four felony counts of tampering with consumer products and received four concurrent 20-year prison terms. When she testified in her own defense, Thompson was unable to explain why she committed the crime, but other signs pointed to her wanting to sicken her former boyfriend.<sup>40</sup>

The origin of the pathogen used to contaminate the pastries was the laboratory itself. The laboratory had a low-temperature storage system for microorganisms used as reference cultures and for quality control. There was no special security system in place to protect stored cultures, so it was easy for unauthorized persons to gain access to them.

### **Letters Laden with *Bacillus anthracis* Spores, September – October 2001**

An unknown person or group mailed seven letters containing *Bacillus anthracis* spores to various media people and politicians on September 18 and October 9, 2001. Spores leaking from the envelopes or dispersed by the act of opening them caused 22 cases of anthrax, of which five persons died. While the method chosen by the perpetrator(s) for dispersing the spores is primitive and inefficient in terms of generating mass casualties, the use of finely milled spores as payload indicates that the perpetrator(s) possess a rather high level of microbiological competence. Since neither the intent nor the perpetrator(s) of these attacks is known, it is impossible to foretell if more attacks of the same type are in the offing. More ominously, it would not take much additional effort for the perpetrator(s) to mount an aerosol attack using the spores he or they obviously possess; if this was done, mass casualties would almost certainly ensue.



## ANNEX 3

### GLOSSARY

**Aerosol**—a suspension of finely divided liquid or solid particles suspended in a gaseous medium such as mist, fog, and smoke. Aerosols are important means of disseminating biological and chemical warfare agents over a large area.

**Bacteria**—these are one-celled organisms lacking a nucleus and having a plasma membrane cell wall. Bacteria can be aerobes or anaerobes; only a small percentage of bacteria are pathogenic. They store most of their DNA in one long looping molecule (chromosome), but can also contain plasmids, which are small, circular, double-stranded DNA molecules that replicate independently from their host.

**Biosecurity**—activities designed to secure for humans, animals and plants freedom from possible hazards attending biological activities, such as research, development, testing and applications; measures taken by governments to guard against damage that may be brought about by accidental or intentional exposure to biological agents or toxins.

**Biotechnology**—a collection of processes and techniques that involves the use of living organisms, or substances from those organisms, to make or modify products from raw materials for agricultural, industrial, or medical purposes.

**Bioterrorism**—the use of pathogens or toxins against human, animal, or plant populations by a terrorist group to achieve political, social, or religious aims. Biocriminality involves the use of pathogens or toxins by an individual or group to attack human, animal, or plant populations for reasons of greed, blackmail, revenge, or other apolitical motives.

**Capability**—the ability to produce or apply a particular set of scientific techniques or technologies.

**Contagion**—the transmission of a disease by direct or indirect contact.

**Culture**—the growth of cells or microorganisms in a controlled artificial environment.

**Database**—a collection of data, defined for one or more applications, which is physically located and maintained within one or more electronic computers.

**Development**—progressive advance from a lower or simpler to a higher or more complex form; the process of applying scientific and technical knowledge to the practical realization or enhancement of a specific product or capability.



**Hazard**—the likelihood that an agent or substance will cause immediate or short-term adverse effects or injury under ordinary circumstances of use.

**HEPA (High Efficiency Particulate Air) filters**—the highest efficiency filters readily available on the open market and used in the aerospace, biomedical, electronic, and nuclear fields. By definition, HEPA filters must capture 99.97% of contaminants at 0.3 microns in size.

**Infection**—the invasion and settling of a pathogen within a host.

**Infectious**—capable of causing infection; spreading or capable of spreading to others.

**Microorganism**—a microscopic living entity, including bacteria, fungi, protozoa, and viruses.

**Molecular epidemiology**—a field of scientific study that uses the techniques of molecular biology to identify microorganisms responsible for causing diseases, determine their physical sources, and clarify their routes of transmission.

**Morbidity**—the relative incidence of disease.

**Pathogen**—an organism that causes disease.

**Pathogenic**—causing or capable of causing disease.

**Risk**—the probability of injury, disease or death for persons or groups of persons undertaking certain activities or exposed to hazardous substances. Risk is sometimes expressed in numeric terms (in fractions) or qualitative terms (low, moderate or high).

**Safe**—not threatened by danger, or freed from harm, injury, or risk.

**Security**—being secure from danger; freedom from fear and anxiety; measures taken by governments to guard against espionage, sabotage, and surprises.

**Technology**—the scientific and technical information, coupled with know-how, that is used to design, produce and manufacture products or generate data.

**Threat**—an indication of something impending and usually undesirable or dangerous; something that by its very nature or relation to another threatens the welfare of the latter.

**Toxicity**—the quality of being poisonous or the degree to which a substance is poisonous.

**Toxicology**—the scientific discipline concerned with the study of toxic chemicals and their effects on living systems.

**Toxin**—toxic organic chemical produced by living organisms, including bacteria, fungi, plants, insects, and mammals, and capable of inducing antibody formation. The most toxic toxins are proteins of bacterial origin. As a result of advances in biotechnology, some protein toxins can be produced by appropriately engineered industrial strains of bacteria in culture. In the future, it should be possible to use peptide synthesis to synthesize non-proteinaceous toxins and their analogs. Toxins are sometimes called “mid-spectrum” agents, which suggests that they are classified as something between living organisms and chemical agents.

**Toxinology**—the study of toxic substances produced by or accumulated in living organisms, their properties and their biological significance for the organisms involved. Toxinology therefore covers venoms and poisons produced by animals, plants, fungi and bacteria.

**Virus**—a virus particle after it has entered a host cell and has subverted or is in the process of subverting that cell’s genetic mechanism to ensure its replication.

**Warhead**—the part of a bomb, missile or shell that houses the explosive charge, or in the case of biological or chemical weapons, the pathogenic or toxic agent.

**Weaponize**—the process of developing a pathogen or toxin to the point where it becomes suitable for use in a weapons system.

**Weapons of Mass Destruction (WMD)**—generally, a weapon that causes casualties and/or physical damage vastly in excess of that brought about by a conventional weapon; biological, chemical, and nuclear weapons are usually described as WMDs. In California, as defined in the CTRP, “any weapon involving a disease organism” is a WMD.



## ANNEX 4

### CRITICAL BIOLOGICAL AGENTS AS LISTED BY THE CDC<sup>41</sup>

#### Category A

The U.S. public health system and primary healthcare providers must be prepared to address varied biological agents, including pathogens that are rarely seen in the United States. High-priority agents include organisms that pose a risk to national security because they:

- can be easily disseminated or transmitted person-to-person;
- cause high mortality, with potential for major public health impact;
- might cause public panic and social disruption; and
- require special action for public health preparedness.

#### *Category A agents include:*

- variola major (smallpox);
- *Bacillus anthracis* (anthrax);
- *Yersinia pestis* (plague);
- *Clostridium botulinum* toxin (botulism);
- *Francisella tularensis* (tularemia);
- filoviruses:
  - Ebola hemorrhagic fever;
  - Marburg hemorrhagic fever; and
  - arenaviruses,
- Lassa (Lassa fever); and
- Junin (Argentine hemorrhagic fever) and related viruses.

#### Category B

Second highest priority agents include those that:

- are moderately easy to disseminate;
- cause moderate morbidity and low mortality; and
- require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

#### *Category B agents include:*

- *Coxiella burnettii* (Q fever);
- *Brucella* species (brucellosis);
- *Burkholderia mallei* (glanders);
- Alphaviruses;

- Venezuelan encephalomyelitis;
- eastern and western equine encephalomyelitis;
- ricin toxin from *Ricinus communis* (castor beans);
- epsilon toxin of *Clostridium perfringens*; and
- *Staphylococcus* enterotoxin B.

A subset of List B agents includes pathogens that are food or water-borne. These pathogens include but are not limited to:

- *Salmonella* species;
- *Shigella dysenteriae*;
- *Escherichia coli* O157:H7;
- *Vibrio cholerae*; and
- *Cryptosporidium parvum*.

### Category C

Third highest priority agents include emerging pathogens that could be engineered for mass dissemination because of:

- availability;
- ease of production and dissemination; and
- potential for high morbidity and mortality and major health impact.

#### *Category C agents include:*

- Nipah virus;
- Hantaviruses;
- tickborne hemorrhagic fever viruses;
- tickborne encephalitis viruses,
- yellow fever; and
- multidrug-resistant tuberculosis.

Preparedness for List C agents requires ongoing research to improve disease detection, diagnosis, treatment, and prevention. Knowing in advance which newly emergent pathogens might be employed by terrorists is not possible; therefore, linking bioterrorism preparedness efforts with ongoing disease surveillance and outbreak response activities as defined in CDC's emerging infectious disease strategy is imperative.

## ANNEX 5

### STAGES OF A BIOTERRORIST ATTACK

The analysis of the four events described in Annex 2 indicates that a biological event comprises six overlapping stages: (1) Preparatory Stage, (2) Attack Stage, (3) Casualty Presentation Stage, (4) Quarantine Stage (if the pathogen in question is contagious), (5) Triage, Treatment, and Disposition Stage, and (6) Resolution Stage. The last stage includes Epidemiological Investigation and, if the event was deliberately caused, Police Investigation. Although the targets of the four known bioterrorism events were humans, a biological attack against animal or plant populations would comprise similar stages. A discussion of each stage follows.

#### Preparatory Stage

The Preparatory Stage is when a terrorist has decided on acquiring a biological weapon and using it against a target population. Acquiring an effective biological weapon and carrying out a successful biological attack requires four vital steps. The terrorist must: (1) secure a culture of a suitable pathogen or a quantity of toxin; (2) develop an appropriate “formulation;” i.e., a combination of the pathogen or toxin and the substrate in which it is suspended or dissolved; (3) obtain an appropriate container to safely store and transport the formulation; and (4) apply an efficient mechanism to disperse the pathogens or toxins over or onto the target population. In addition, if the BW agent is to be delivered by aerosol, a fifth step is essential, namely the terrorist must disperse the aerosol formulation when favorable meteorological conditions exist. If the terrorist has been able to take these four or five vital steps, the likelihood of him being able to mount a successful attack is high. The Preparatory Stage ends with the deployment of the biological weapon to the site of the planned attack.

#### Attack Stage

During the attack stage, the terrorist activates the deployed biological weapon. The biological weapon could be armed with either a non-contagious or contagious agent. In regards to a non-contagious agent, if the aim is to generate mass casualties among humans, the most effective approach is for the terrorist to disperse the pathogen or toxin either as an aerosol or in food or beverages that will be consumed by large numbers of people.

If the criminal chooses to employ a contagious pathogen in an attack against humans, he would be most likely to select one of the pathogens that have been designated by the CDC as Category A agents (see Annex 4). The contagious viruses on that list include the smallpox virus, several filoviruses, and the Lassa fever virus. The only contagious bacterial species on the list is *Yersinia pestis*. Since *Y. pestis* is not very contagious, one of the listed viruses would be more likely to be utilized by the criminal. Initiating an epidemic within the target population with a contagious virus would not be difficult, especially if the population is susceptible to the selected pathogen. The easiest method probably is for the attacker to use the biological equivalent of a suicide bomber; i.e., a

person who has been deliberately infected with a contagious agent and dispatched to the target population before disease symptoms appear (this is called the prodromal phase of disease). In many viral diseases, including influenza, the infected individual is more contagious in the prodromal state than after disease symptoms have appeared. With other viral diseases, the person must be showing signs of the disease before he or she is able to infect others. For example, a person afflicted with smallpox is not contagious until a rash appears.

Police, health providers, and public health professionals most likely would be unaware that an attack is taking place as it occurs. The first they would know about it would be when victims begin presenting themselves, which is the next stage.

If the terrorist was targeting animals or plants, the mode of attack inevitably would involve contagious pathogens. As such, the methods used to disperse them most likely would be relatively simple. Without going into detail here how this might be done, initiating an epizootic of foot-and-mouth disease in herds of cattle or rice blast among rice paddies in the Sacramento delta would not be difficult, and would be likely to cause enormous economic damage to the state. The visual manifestations of such attacks would probably not be apparent to state veterinarians or plant pathologists until some days or weeks after the attacks had taken place.

### **Casualty Presentation Stage**

The first sign that a biological attack has occurred against a human population will probably be that many sick people present themselves to physicians and EMDs. This may occur proximal to the site where the attack took place or, if the attack was mounted against an underground railroad station or airport, affected persons may show up at widely dispersed health providers. The longer the incubation period for the agent used in the attack, the more dispersed will be its victims.

In agriculture, the first signs of a biological attack would be when farmers noticed a large number of sick animals or crop fields showing obvious damage such as leaves wilting. If there was the near-simultaneous appearance of disease in several, separate feed lots or crop fields, a tentative conclusion could be made that it was deliberately initiated.

### **Quarantine**

The issue of quarantine comes up for consideration whenever health providers deal with a patient infected, or believed to be infected, with contagious pathogens. If a contagious pathogen was used in a biological attack, it certainly would bring about a more complicated and dangerous situation for first responders, EMDs, health providers, and public health professionals than would a non-contagious pathogen. The difficulties would accrue from the very first moment of the disease outbreak caused by the contagious pathogen. When the first ill persons present themselves to EMDs and personal physicians, the staff members who do the initial medical evaluations and administrative functions are likely to unknowingly contract the causative pathogen. So would the physician who does the initial evaluation of ill persons. If the initial evaluation

is done by physicians having a high index of suspicion and the illness is tentatively diagnosed at an early stage as being contagious, the question that must be immediately answered is what to do with the ill persons. From our research it has become clear that the largest and best equipped EMDs usually have one, at the most two, rooms where a patient can be completely isolated; i.e., the room can be sealed off from the rest of the EMD, it has negative air pressure (air from the isolation room does not flow to the open environment without first having been filtered), and its air handling apparatus is equipped with HEPA filters. Of course, the parent hospitals of EMDs have regular rooms that quickly can be adapted for isolation use, but when this is done the specialized equipment required for this purpose is rapidly depleted. In view of these universally limited resources, were a sizeable outbreak to take place in the U.S., isolation rooms at the local level would be filled, then overfilled, almost immediately.

In agriculture, quarantine would have to be instituted immediately upon a large-scale animal or plant disease outbreak being noticed. The procedures already developed by the agricultural agencies for dealing with infectious disease outbreak of natural etiology, such as destroying animals and burning crops, would have to be initiated to contain damage.

### **Triage, Treatment, and Disposition Stage**

Triage is defined as "...the sorting of and allocation of treatment to patients and especially battle and disaster victims according to a system of priorities designed to maximize the number of survivors."<sup>42</sup> EMD physicians in particular must be prepared to perform triage in cases where large numbers of sick persons present themselves and resources to treat them are limited. Usually, the physician who performs the initial evaluation of sick persons will have to decide on one out of three courses of action for each individual. If the person being evaluated is slightly injured or not so sick, treatment for this person will be delayed or he or she will be rapidly evacuated. Alternatively, if the person is moribund, he or she will be made comfortable, but denied scarce resources. A person who is severely injured or very sick, but has a good chance of survival if accorded rapid treatment, will be given first call on medicines and services.

Before treatment is given to a victim of a biological event, health providers will have to ask themselves whether it is first necessary to decontaminate that person. Unlike victims of chemical events, in most cases no decontamination will be necessary beyond disrobing the victim and washing exposed areas of the body with soap and water. The reason why this is so is that most pathogens and toxins (with the exception of the rare mycotoxin) are not dermally active or volatile. Also, since victims of biological attacks most likely have changed clothing during the intervening time between exposure and the appearance of signs of sickness (incubation time), and taken showers or baths as well, there is not likely to be anything to decontaminate. However, if the biological attack has been carried out with a contagious pathogen, the problem of how to protect health providers from contagion remains.

The ability of local health providers to effectively manage the aftermath of a biological event depends in the first instance on the number of patients that will present themselves for treatment and within what period of time the presentations will take place. There are



very few hospitals and EMDs in the United States that are in a position to receive, treat, and dispose of over a few hundred victims of a biological attack who present themselves over a period of one or two days. If the victims numbered more than 1,000, probably no single health care facility anywhere could handle the load. There just would not be a sufficient supply of antibiotics, antidotes, and critical care equipment, such as ventilators and respirators, on hand to treat so many persons. This being the situation, most victims would either have to be transferred to nearby health care facilities, thereby spreading the treatment burden, or they would have to be housed in temporary facilities and wait for new medical supplies and equipment to arrive from stores elsewhere. The efficient carrying out of either approach demands a high degree of coordination between local, state, and federal authorities.

In agriculture, there is of course no need for triage or treatment. As for disposition, there might be a need to dispose of a large number of carcasses of killed animals. This unpleasant task has in the past proven to be difficult because it places considerable psychological strain on those who must move and burn the carcasses. At the same time, steps must be taken to make certain that none of the infectious pathogens escape the area affected by the disease outbreak. The assistance of the National Guard for these tasks would most likely be necessary. The burning of infected crops would not be so strenuous, but care must be taken so that spores from the infective pathogen (if a fungus) are not aerosolized by drafts or eddies created by flames.

### **Resolution Stage**

During the resolution stage, the biological event terminates or is controlled. Thus, victims of a biological accident or attack recover or are buried, the lives of health providers and public health professionals return to normal, medicines and expendable supplies are replenished, and the society in general heals from the injuries and insults that the event brought about. For the purpose of this report, this stage need not be considered except for epidemiological investigation that inevitably will be carried out during this time. Further, if this investigation indicates or demonstrates that the biological event was deliberately caused, a police investigation would ensue.

A bioterrorist attack will be resolved in one of three ways. First, if it were a food-borne or beverage-borne attack, which usually are self-limiting, its resolution could depend on the removal, or complete consumption, of the contaminated food or beverage. This might be done in the course of normal activities; for example, the contaminated food is consumed so none remains to infect more persons than those unlucky enough to have partaken of the original portion, or the dishes containing food remnants are washed and their contents flushed away. As nothing remains of the contaminant, no new illnesses will occur and the outbreak ends as sick people recover. An outbreak that ends this way is likely to be deemed as having had a natural etiology by public health professionals. Second, a contaminated food or beverage might be diluted to such an extent that its pathogen or toxin load is no longer sufficient to infect persons or natural forces break down the contaminant so it is no longer viable or toxic. The outbreak ends as described above and its etiology probably will also be deemed to have been natural. Third, an epidemiological investigation generates findings that reveal the etiology of the outbreak

and this knowledge is used to destroy or decontaminate the source of the infectious or toxic material. Once this is done, the outbreak ends as described above. An outbreak that ends this way probably will be investigated and, if so, the investigation has a high possibility of revealing that it was deliberately caused.

In the United States, local and state health departments have responsibility for carrying out epidemiological investigations. Most states employ a state epidemiologist to direct such efforts; these directors are assisted by epidemiologists who staff county health departments. If problems arise that are too complex or difficult for state and local health departments to handle, or if they would like to confirm the validity of their findings, they can call on help from the CDC.

One caveat should be made to the analysis above. It could be very difficult to discern whether a biological attack has taken place if the attacker uses a food-borne pathogen. Were an outbreak caused by a food-borne or beverage-borne pathogen to occur, the tendency of public health investigators would be to believe that the outbreak had a natural etiology. The history of deliberately caused biological events is indicative. Although there have been very few such incidents, as described above, the largest in terms of causing casualties resulted from the deliberate contamination in 1984 of Oregon salad bars by members of the Rajneeshees cult, which caused 751 persons to contract gastrointestinal disease. However, the initial investigation performed by the local health department determined that it had a natural etiology. It was not until some months after the investigation's conclusion that a Rajneeshees member confessed his involvement in the biological attack. If he had not done so, the outbreak probably would still be recorded as a natural event. The lesson here is that despite the U.S. possessing sophisticated capabilities in reference to the performance of epidemiological investigations at the local and federal levels, a biological attack may go undetected because its manifestations cannot be distinguished from outbreaks having a natural origin or the resulting outbreak is never fully investigated because investigators are biased from the beginning and decide without further ado that it has a natural etiology.

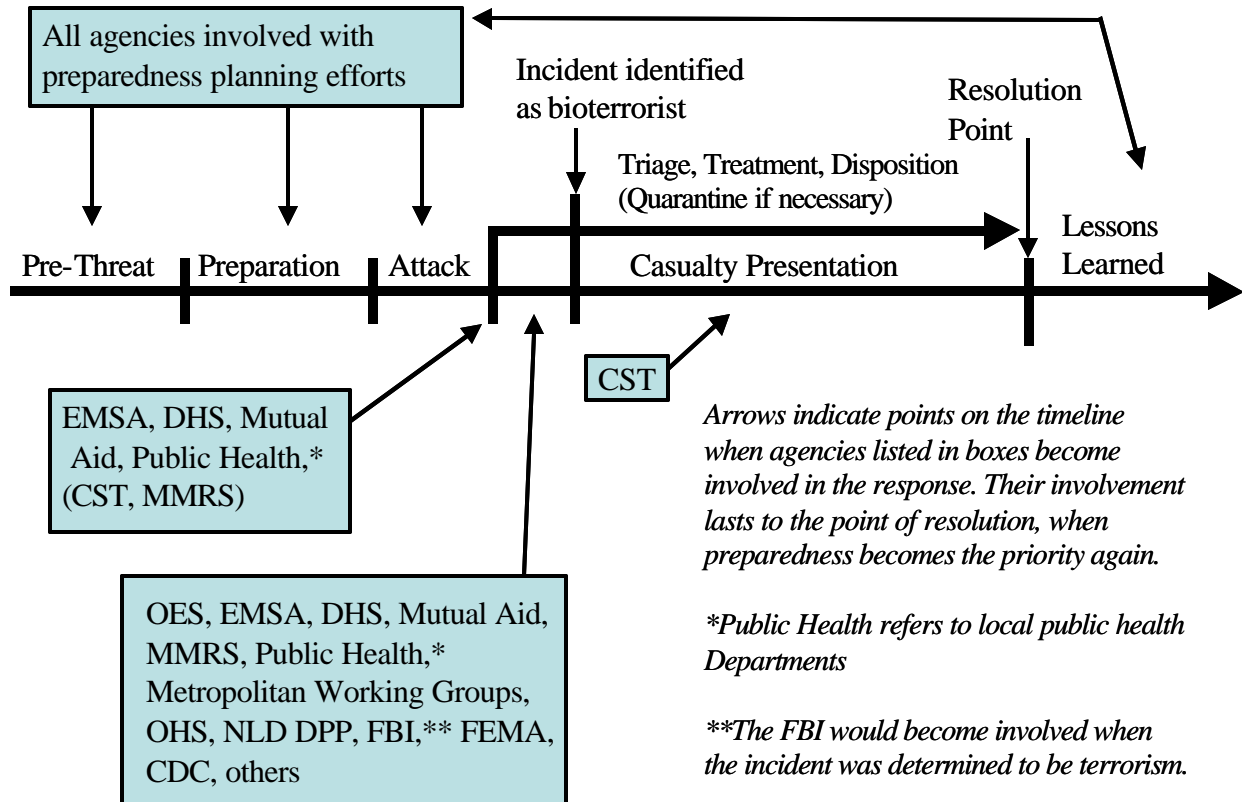
The situation is similar when considering animal and plant diseases. There are hundreds of disease outbreaks every year affecting U.S. animal and plant populations and no one can guarantee that all of them have had a natural origin. The epidemiological investigation of animal and plant disease outbreaks are, if anything, more difficult to undertake than human diseases.



# ANNEX 6

## SEQUENCING TIMELINE

### Sequencing Timeline for Bioterrorism Response





## ANNEX 7

### ACRONYMS AND THEIR DEFINITION

AHS	Automated Highway System
BATWG	[San Francisco] Bay Area Terrorism Working Group
BW	Biological Weapon
CBPGR	Center for Bioterrorism and Public Health Research (proposed)
CSTI	California Specialized Training Institute
CDC	U.S. Centers for Disease Control and Prevention
CNS	Center for Nonproliferation Studies, Monterey Institute of International Studies
CSTs	Civil Support Teams
CSAC	California State Association of Counties
CTRP	California Terrorism Response Plan
DHHS	U.S. Department of Health and Human Services
DHS	California Department of Health Services
DMATs	California's Disaster Medical Assistance Teams
ECC	Emergency Coordination Center (of the DHS)
EIS	Epidemic Intelligence Service (of the CDC)
EMB	Environmental Management Branch (of the DHS)
EMD	Emergency Medical Department
EMS	Emergency Medical Services
EMSA	Emergency Medical Services Authority
EPO	Emergency Preparedness Office (of the DHS)
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
HEPA	High Efficiency Particulate Air
HMICP	California's Hazardous Materials Incident Contingency Plan
ICS	Incident Command System
IC	Incident Commander
JEOC	Joint Emergency Operations Center
LATFOT	Los Angeles Task Force on Terrorism
MMRS	Metropolitan Medical Response System
NDMS	U.S. National Disaster Medical System

NGO	Non-Governmental Organization
NPS	National Pharmaceutical Stockpile (of the CDC)
OEP	Office of Emergency Preparedness (of the DHHS)
OES	California Governor's Office of Emergency Services
OHS	U.S. Office of Homeland Security
S-TAC	State Threat Assessment Committee
SEMS	Standardized Emergency Management System
SFCTTF	San Francisco Counter Terrorism Task Force
SSCOT	State Strategic Committee on Terrorism
UCLA	University of California Los Angeles
WMD	Weapon Of Mass Destruction

## **ANNEX 8**

### **IN FORCE AND PENDING FEDERAL LEGISLATION RELATED TO BIOTERRORISM AS OF MARCH 1, 2002<sup>43</sup>**

#### **BIOTERRORISM PREPAREDNESS ACT OF 2001, S. 1765**

On December 20, 2001 the Senate passed by unanimous consent the Kennedy-Frist Bioterrorism Preparedness Act, S. 1765 (formerly S. 1715). Senators William Frist (R-TN) and Edward Kennedy (D-MA) reintroduced S. 1765, the Bioterrorism Preparedness Act of 2001 on December 4, 2001.

#### **PUBLIC HEALTH SECURITY AND BIOTERRORISM RESPONSE ACT OF 2001, H.R. 3448**

On December 12, 2001 H.R. 3448, the Public Health Security and Bioterrorism Response Act of 2001 was passed by the House of Representatives, under suspension of the rules. The bill is sponsored by Representative W. J. "Billy" Tauzin (R-LA).

#### **DEPARTMENT OF DEFENSE APPROPRIATIONS BILL, H.R. 3338**

On December 4, 2001, the Senate Appropriations Committee approved HR 3338, the DOD Appropriations Bill for FY 2002, which Senator Diane Feinstein (D-CA) and Senator Judd Gregg (R-NH) amended to include Section 8134 Regulation of Biological Agents and Toxins. Section 8134 amends the Public Health Service Act Section 351A Enhanced Control of Biological Agents and Toxins and is the same as Section 216 Regulation of Biological Agents and Toxins of S 1765, the Bioterrorism Preparedness Act of 2001, which was reintroduced by Senator Frist and Senator Kennedy on December 4, 2001. Section 8134 was removed from the Senate DOD Appropriations bill on December 19.

#### **BIOTERRORISM PREPAREDNESS ACT OF 2001, H.R. 3310**

On November 16, 2001 Representative Greg Ganske (R-IA) introduced H.R. 3310, the Bioterrorism Preparedness Act of 2001.

#### **BIOTERRORISM PROTECTION ACT (BIOPACT) OF 2001, H.R. 3255**

On November 8, 2001 Representative Robert Menendez (D-NJ) introduced H.R. 3255, the Bioterrorism Protection Act (BioPact) of 2001.

#### **DEADLY BIOLOGICAL AGENT CONTROL ACT OF 2001, S. 1661**

On November 8, 2001 Senators Diane Feinstein (D-CA) and Jon Kyl (R-AZ) introduced S. 1661, the Deadly Biological Agent Control Act of 2001.



## **ANTITERRORISM LEGISLATION, H.R. 3162**

The compromise antiterrorism legislation, HR 3162, passed on October 24 by the House and October 25 by the Senate, and signed into law on October 26, expands the biological weapons statute in Chapter 10 of Title 18, United States Code, to make it an offense for a person to knowingly possess any biological agent, toxin or delivery system of a type or in a quantity that, under the circumstances, is not reasonably justified by prophylactic, protective, bona fide research or other peaceful purpose. H.R. 3162 also restricts certain persons from possessing a select agent listed in Appendix A, Part 72 of Title 42, Code of Federal Regulations, which were promulgated pursuant to Section 511 (d) of the Antiterrorism and Effective Death Penalty Act of 1996 (Public Law 104-132) H.R. 3162 defines a restricted person. See especially the Biological Weapons Statute, Section 817.

## **BIOTERRORISM ENFORCEMENT ACT OF 2001, H.R. 3160**

The House of Representatives passed the Bioterrorism Enforcement Act of 2001, H.R. 3160, on October 23. The bill amends the Antiterrorism and Effective Death Penalty Act of 1996 to extend the regulatory regime established in 1997 to control transfers of select agents to now include controls on persons who knowingly possess them. The bill creates criminal provisions for persons who possess select agents without registration and for those who handle select agents with reckless disregard for public health and safety. The Secretary of DHHS is directed to impose prompt registration for possession of select agents, and requirements for handling, physical security, access, the credentialing and security of personnel and the reporting of loss or theft of select agents.

The bill also restricts certain persons from possessing select agents. The bill, by reference, incorporates the list of persons who are forbidden to own a handgun for reasons of criminal or pathological behavior. Aliens, not lawfully admitted for permanent residence, may not possess select agents; however, the DHHS Secretary is given waiver authority, in consultation with the Attorney General, to designate categories of aliens or particular individuals who may be admitted to the U.S. on non-immigration visas to permit them to work with select agents in order not to impede public health activities or research.

## **BIOWEAPONS CONTROL AND TRACKING ACT OF 2001, S. 1706**

On November 15, 2001 Senator Tom Harkin (D-IA) introduced S. 1706, the Bioweapons Control and Tracking Act of 2001.

## **DEADLY BIOLOGICAL AGENT CONTROL ACT OF 2001, H.R. 3306**

On November 15, 2001 Representative Adam Schiff (D-CA) introduced H.R. 3306, the Deadly Biological Agent Control Act of 2001.

**PATHOGEN RESEARCH, EMERGENCY PREPAREDNESS AND RESPONSE  
EFFORTS ACT OF 2001, S. 1635**

On November 6, 2001, Senator Tim Hutchinson (R-AR) introduced S. 1635, the Pathogen Research, Emergency Preparedness and Response Efforts Act of 2001.



## ANNEX 9

### ENDNOTES AND REFERENCES

<sup>1</sup> T. V. Inglesby, R. Grossman, & T. O'Toole, 2000, "A plague on your city: observations from TOPOFF," *Biodefense Quarterly*, vol. 2, no. 2, pp. 1-10; Reuters. 2001. "U.S. called vulnerable to biological attack; smallpox simulation alarms officials," *Washington Post*, July 24.

<sup>2</sup> Governor's Office of Emergency Services, *California Terrorism Response Plan: An Annex to the State Emergency Plan* (Sacramento: Governor's Office of Emergency Services, March 1999 [Updated February 2001]).

<sup>3</sup> A discussion of terrorism against animals and plants, including a description of relevant pathogens, can be found in the following publications: N. W. Schaad, J. J. Shaw, A. Vidaver, J. Leach, and B. J. Erlick, *Crop BioSecurity* (St. Paul, MN: American Phytopathology Society, 1999); Sharon A. Watson, "The changing biological warfare threat—anti-crop and anti-animal agents," in *Annals of the New York Academy of Sciences*, vol. 894, pp. 159-163 (1999); Terrance M. Wilson, Linda Logan-Henfrey, Richard Weller, and Barry Kellman, "Agroterrorism, biological crimes, and biological warfare targeting animal agriculture," in *Emerging Diseases of Animals*, edited by Corrie Brown and Carole Bolin (Washington, D.C.: ASM Press, 2000), pp. 23-57.

<sup>4</sup> Governor's Office of Emergency Services, *Standardized Emergency Management System Guidelines* (Sacramento: Office of Emergency Services, March 1995).

<sup>5</sup> Gray Davis, 2001, Executive Order D-47-01, October 10.

<sup>6</sup> John Parachini, 2002, "Access and Control of Dangerous Biological Materials in California," in K. Jack Riley, et al. (eds.), 2002, "The Implications of the September 11<sup>th</sup> Terrorist Attacks for California," RAND Issue Paper, (Santa Monica, CA: RAND).

<sup>7</sup> State Strategic Committee on Terrorism, 2002, "Initial Recommendations Executive Order D-47-01," (Sacramento: Governor's Office of Emergency Services).

<sup>8</sup> See the CSTI homepage at <http://www.oes.ca.gov/oeshomep.nsf/csti/csti+home+page>.

<sup>9</sup> Home Page of the Emergency Medical Services Authority: <http://www.emsa.cahwnet.gov>.

<sup>10</sup> The AHS is a program within the National Automated Highway System Consortium, of which the California Department of Transportation is a core member. The AHS aims to reduce traffic congestion of existing highways. In case of a biological emergency, an effective AHS would be most useful.

<sup>11</sup> California Department of Health Services, 2001, *California Hospital Bioterrorism Response Planning Guide* (Draft), October 5.

<sup>12</sup> California Department of Health Services, 2001, *California Hospital Bioterrorism Response Planning Guide* (Draft), October 5.

<sup>13</sup> See the home page for the California Legislative Council: <http://www.leginfo.ca.gov>.

<sup>14</sup> See the home page of the California Animal Health and Food Safety Laboratory: <http://sphinx.ucdavis.edu/index.html>.

<sup>15</sup> California State Association of Counties, 2002, "Fight Against Terrorism Strikes California County Budgets Hard," <http://www.csac.counties.org/feature.html>.

<sup>16</sup> California State Association of Counties, 2002, "California Counties' Web Sites," [http://www.csac.counties.org/counties\\_close\\_up/county\\_web/](http://www.csac.counties.org/counties_close_up/county_web/).

<sup>17</sup> County of Santa Clara, Public Health Department Disease Prevention and Control, 2000, *Zebra Packet: Bioterrorism Information for Clinicians*, November, <http://www.sccphd.org/diseasecontrol/bioterrorism.asp>.

<sup>18</sup> White House, 2001, "President Establishes Office of Homeland Security," <http://www.whitehouse.gov/news/releases/2001/10/20011008.html> (#1. Mission and Management); and "Homeland Security State Contact List at <http://www.whitehouse.gov/homeland/contactmap.html>.

<sup>19</sup> Press Release, "Governor Davis Discusses Anti-Terror Measures with Bay Area Mayors," Office of the Governor, November 8, 2001.

<sup>20</sup> *Improving Local and State Emergency Response to Terrorist Incidents Involving Biological Weapons*, Department of Defense, August 1, 2000.

<sup>21</sup> San Diego County Medical Society, "SDCMS Primer on Bioterrorism," October 11, 2001.

- 
- <sup>22</sup> For a comprehensive guide to such courses, see: "Compendium of Weapons of Mass Destruction Courses Sponsored by the Federal Government," January 2000, available at <http://www.ndpo.gov/compenium.pdf>.
- <sup>23</sup> See the home page of the UCLA Center for Public Health and Disasters: <http://www.ph.ucla.edu/cphdr/bioterrorism/index.html>.
- <sup>24</sup> Stanford Medical Center, 2002, "Stanford Provides Model Bioterrorism Plan to Hospitals Nationwide," [http://mednews.stanford.edu/news\\_releases\\_html/2001/decreleases/bioterrorism.html](http://mednews.stanford.edu/news_releases_html/2001/decreleases/bioterrorism.html).
- <sup>25</sup> See the home page of the Center for Nonproliferation Studies: <http://cns.miis.edu>.
- <sup>26</sup> Jeffrey D. Simon, 1989, *Terrorists and the Potential Use of Biological Weapons: A Discussion of Possibilities*, Report # R-3771-AFMIC, (Santa Monica: RAND).
- <sup>27</sup> Jeffrey D. Simon, 1989, *Terrorists and the Potential Use of Biological Weapons: A Discussion of Possibilities*, Report # R-3771-AFMIC, (Santa Monica: RAND).
- <sup>28</sup> K. Jack Riley, et al. (eds.), 2002, "The Implications of the September 11<sup>th</sup> Terrorist Attacks for California," RAND Issue Paper, (Santa Monica, CA: RAND).
- <sup>29</sup> See the home page of the Center for International Security and Cooperation: <http://cisac.stanford.edu/>.
- <sup>30</sup> California Department of Health Services, "Notice of Emergency Rulemaking. Disease Reporting to Assess Potential Bioterrorism Events (R-58-00E)," 2002, <http://www.dhs.cahwnet.gov/>.
- <sup>31</sup> See the home page of the Center for the Study of Bioterrorism and Emerging Infections, Saint Louis State University of Public Health: <http://www.slu.edu/colleges/sph/bioterrorism/index.html>.
- <sup>32</sup> See the home page of the Center for Civilian Biodefense Strategies, The Johns Hopkins University: <http://www.hopkins-biodefense.org/>.
- <sup>33</sup> Robert D. McFadden, 2002, "Consortium for responses," *New York Times*, February 12.
- <sup>34</sup> W.S. Carus, 2000, "The Rajneeshees (1984)," in *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, J. B. Tucker, ed., MIT Press, Cambridge, Massachusetts, pp. 115-138.
- <sup>35</sup> T. J. Török, R. V. Tauxe, R. P. Wise, J. R. Livengood, R. Sokolow, S. Mauvais, K. A. Birkness, M. R. Skeels, J. M. Horan, & L. R. Foster, 1997, "A large community outbreak of Salmonellosis caused by intentional contamination of restaurant salad bars," *Journal of the American Medical Association*, vol. 278, no. 5, pp. 389-395.
- <sup>36</sup> D. E. Kaplan, 2000, "Aum Shinrikyo (1995)," in *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, J. B. Tucker, ed., MIT Press, Cambridge, Massachusetts, pp. 207-226.
- <sup>37</sup> S. Sugimoto, 1997. "Testimony given at the trial of Shigeo Sugimoto" (in Japanese), *Asahi Shinbun*, March 19.
- <sup>38</sup> E. Croddy, 1995, "Urban terrorism - chemical warfare in Japan," *Jane's Intelligence Review*, vol. 7, no. 11, pp. 520-523.
- <sup>39</sup> S. A. Kolavic, A. Kimura, S. L. Simons, L. Slutsker, S. Barth, & C. E. Haley, 1997, "An outbreak of *Shigella dysenteriae* Type 2 among laboratory workers due to intentional food contamination," *Journal of the American Medical Association*, vol. 278, no. 5, pp. 396-398.
- <sup>40</sup> "Hospital employee sentenced to 20 years for poisoning co-workers," *Abilene Reporter-News*, September 12, 1998.
- <sup>41</sup> CDC Strategic Planning Workgroup. "Biological and chemical terrorism: Strategic plan for preparedness and response. Recommendations of the CDC Strategic Planning Workgroup," *Morbidity and Mortality Weekly Report* 49(RR04):1-14 (2000).
- <sup>42</sup> Merriam-Webster Collegiate Dictionary. Merriam-Webster, Incorporated, Springfield, Massachusetts, Merriam-Webster, Incorporated, 2001, <http://www.m-w.com/cgi-bin/dictionary>.
- <sup>43</sup> See the home page for the American Society for Microbiology: <http://www.asmsusa.org/pcsrc/biolegislation.htm>