

Council of State and Territorial Epidemiologists
Position Statement

03-ENV-01

Committee: Environmental/Occupational/Injury

Title: Public Health Capacity to Respond to Contamination from Terrorism

Statement of the Problem:

Past terrorist events have most commonly involved chemical contamination. Yet preliminary results of a recent CSTE survey suggest that state public health departments are poorly prepared to provide support in this kind of terrorism. Current non-public health funding is focused on the traditional first responders who have a key role in the acute phase of catastrophic chemical events in the general environment and work places. However, public health has an important but less recognized role in the acute and recovery phase of these events and has the lead role when chemicals contaminate via disseminated delivery mechanisms such as water, food, drugs and products. A well prepared public health department would be able to provide support in the areas of environmental epidemiology, toxicology, occupational and environmental medicine, worker health and safety, environmental exposure assessment, risk communication and community/labor relations both in the acute and recovery phases of such events. There has been inadequate public health funding to prepare for chemical, radiological and contaminating terrorism.

Statement of the desired action(s) to be taken:

1. The Centers for Disease Control and Prevention through ATSDR, NCEH and NIOSH should immediately convene a stakeholder workgroup to develop core environmental/occupational public health competencies, staff capacities and surveillance systems needed for each state to be prepared to respond to contaminating terrorism, especially that involving chemicals and radiation. Among the agencies that should be considered are: Homeland Defense through FEMA, the Environmental Protection Agency NACCHO, Association of Public Health Labs and the NIH. The state agency counterparts should also be represented.

2. In 2001, CSTE in collaboration with APHL developed an assessment of immediate need (in addition to current levels of support for *bioterrorism* preparedness) that called for \$55,000,000 to support State and Territorial Health Departments to assure an environmental public health presence and environmental laboratory capacity (in addition to chemical biomarker testing capacity) in every state. CSTE reaffirms the critical need for this annual \$55,000,000 over and above the current public health *bioterrorism* preparedness funding. Such a level of funding is necessary to assure epidemiological, toxicological, industrial hygiene and laboratory public health support to prepare for and respond to contaminating terrorism. CDC/ATSDR and FEMA should assist the public health community in obtaining these necessary resources.

Public Health Impact:

Implementation of this proposal will identify the critical capacities and competencies necessary to establish a dual-use national environmental public health infrastructure. When fully funded it will significantly strengthen the public health partnership component of FEMA's chemical and radiation terrorism response mission. It will provide for a public health response to those diffuse methods of delivery of terrorist contamination for which public health agencies take the lead. In support of FEMA, this approach builds upon already established networks of state public health cooperative agreement programs such as ATSDR's Superfund Site Assessment Program, NCEH Environmental Public Health Tracking, and the CDC *Bioterrorism* Cooperative agreements. It will enhance the capacity of state and territory health departments to assess and respond to acts of contaminating terrorism within the FEMA strategic plan in a manner that minimizes the public health impact of such acts. It will also improve the ability of the states to assist FEMA in responding to all disasters. Increasing the number of epidemiological, medical, toxicological and other technical public health experts and non-biological specimen laboratory support capacity at

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the state and regional level will facilitate rapid and timely response and assessment where and when it is needed most. These experts, supported by enhanced laboratory capacity can then advise local, state, territories, tribes and Federal authorities on the appropriate planning and response measures necessary to mitigate and minimize the public health hazards posed by contaminating terrorism, including attacks on local chemical manufacturing, storage, and transportation facilities. This approach augments and empowers established networks of state, territory, tribal and local health care providers and leaders of local communities under both the respected Public Health and FEMA umbrellas. It will allow them to utilize epidemiological methods to assess local preparedness and through improved access to technical expertise and information provide advice on necessary actions to prevent or respond to acts of chemical and radiation terrorism in a way that minimizes the public health impact.

Background

The U.S. Department of Justice's Federal Bureau of Investigation (FBI) rates industrial chemical terrorism as a major threat to communities in the United States. Owing to limits on financial, personnel, and time resources available to government, it is vital that resources be utilized efficiently, especially that they be employed to address the most pressing threats. Biologic terrorism, with its perceived potential for infinite spread, is feared (and funded) as a catastrophic threat. For instance, in the FY2004 Department of Homeland Security Budget, almost twice as much money is allocated to biological countermeasures as is allocated to chemical, radiological, nuclear, and high explosives countermeasures combined¹. Yet, at least in terms of the empirical record, bioterrorism is not the most popular choice of agent type for terrorists seeking to use unconventional weapons. While on the face of it, the majority of total CBRN incidents perpetrated by non-state actors are biological in nature (68%)², this consists of more than 1,000 hoaxes. If hoaxes are removed from consideration³, chemical incidents are by far the most common (58% - 277/481 cases), with biological incidents constituting 17% of the total and radiological or nuclear incidents 14%. When looking at use of agent by subnational actors (terrorist or criminal) the difference is even more striking. Out of 246 uses of CBRN agents, 164 (67%) were with chemical agents, 39 (16%) with biological and 16 (7%) radiological⁴.

Nor are biological agents the most dangerous subnational weapons according to the historical record – the Monterey WMD Terrorism Database records a total of 953 fatalities and 4,351 non-fatal injuries from chemical agents and only 8 fatalities and 1,059 non-fatal injuries from biological agents. In fact there is not a single incident involving the use of a biological agent that has resulted in more than 5 fatalities. This is not to say that bioterrorism is not a threat since terrorist tactics constantly evolve - however, historically chemical weapons have been easier and cheaper for terrorists to use than biological weapons.

In terms of delivery method, when regarded as a single delivery category the most prominent type of delivery involves food or water contamination (21 consumer product tamperings, 17 water supply contaminations, and 36 other cases where food or drink was used to deliver agents). In fact, 12 of the 39 uses of biological agents even involved contamination of one sort or another.

This implies that it is not only the epidemic spread of bio-agents that is a threat – empirically, other agent types – chemical and radiological – are more likely to be used, and contamination is a major delivery method.

Four factors are key to reducing morbidity, mortality and societal recovery from chemical/radiological and contaminating terrorist events: (a) early detection of events and related sentinel illness through public health surveillance linked to (b) local/state response capability and (c) rapid mobilization of regionally or centrally located Federal resources to support the local response. Traditional first responders are crucial in the initial response to high-impact chemical or radiation releases such as those associated with state-sponsored terrorist attacks and other catastrophic environmental contaminating events. However other disseminated delivery methods such as

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water, food, drugs and consumer products are likely to be first identified from public health surveillance and initially would be dealt with directly by health departments.

The experience with Anthrax spores in the US Postal System underscores that contaminating terrorism can cause major disruption, labor/management and community stakeholder conflict and overwhelm public health epidemiology, toxicology and laboratory capabilities without actually killing very many people. Microbial agents, biotoxins, chemicals, or radiation can cause acute as well as chronic contamination concerns. The delivery methods for contamination can be crucial public or private facilities, water systems, financial systems, means of transportation, or commonly used products. Persistent contamination can convert a crucial facility into a Love Canal with all the regulatory and social consequences that were observed there. Hazardous chemicals and radiation-emitting agents abound in modern society.

There has been proliferation of federal funding mechanisms addressing bioterrorism. DHHS/CDC and Homeland Defense/FEMA are the two primary funding mechanisms supporting state functions. The DHHS/CDC funding has a strong infectious disease emphasis and at the state and local level funds have been directed primarily toward biological agent issues. The CDC/NCEH chemical laboratory is world renowned for their human tissue analysis, but lacks expertise or capacity for environmental media analysis (air, water, soil, and surfaces). This results in a major environmental health gap in the CDC support for state public health response to contaminating terrorism.

FEMA's expertise and focus has been upon Incident Command and Control, emergency response and initial community recovery. Their terrorism specific primary focus has been upon training and equipping first responders. FEMA must rely upon others to assist with exposure assessment and post event impact assessment. At the state level, it is often the environmental health programs that are used to augment the environmental public health components of Emergency Government/ FEMA supported action. That capacity, while appropriate for natural disaster, will not be sufficient to address the laboratory and staff intensive work necessary to manage the epidemiological and toxicological assessment and post-event clearance evaluation necessary for a contaminating chemical or radiation terrorist attack.

State-based planning for the use of federal appropriations to address broad, terrorist event related monitoring capacity is well underway within all 50 states. Chemical, radiation, and complex terrorist threats are as credible as the biological ones. During an 'incident' response, epidemiological, toxicological and environmental laboratory capacity for conducting environmental health studies involving exposures via contaminated environmental media are as crucial as are the conventional medical issues of case recognition, treatment, and prophylaxis. In today's complex environment, skills for these broader environmental/disease tracking/bio-monitoring applications are just as specialized as infectious disease ones, and currently less available.

Insufficient federal moneys have been earmarked for the environmental public health planning, response to a crisis, or to manage the recovery phases of contaminating terrorism. Ideally public health agencies would have identified core competencies, surveillance capacities and sufficient staffing resources to prepare and drill with other agencies and likely stakeholders, and would have access to state laboratory and other assets necessary to respond to the crisis and recovery phases of contaminating terrorism or natural disasters.

Public health agencies would be expected to contribute to the following activities:

Early Detection Phase

- 1) Use pre-established networks of alert physicians to detect unusual numbers of patients with unexpected disease (if this is the mode of discovery) and systems such as Poison Control Centers

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- 2) Use principles of epidemiology to develop case definitions, identify likely agents, pathways of exposure, bodily routes of entry (if contamination is discovered through unexpected disease)

Crisis Phase

- 1) Advise on worker health and safety for first responders and other workers
- 2) Provide advice on exposure assessment for immediate decisions and interpretation of alleged health effects as they are identified during later phases
- 3) Documenting the morbidity, mortality and disposition of affected subjects
- 4) Identify cohorts at risk of subsequent health effects and how to reach them later.
- 5) Assist with toxicological and medical advice with regard to contaminated areas of concern which should not be reentered
- 6) Help staff the standardized emergency management Command and Control organizational structure and work through them.

Recovery Phase

- 1) Monitor worker health and safety
- 2) Provide risk communication for labor, management and community stakeholders and facilitate development of a plan for decontamination
- 3) Provide toxicological and medical advice on “how clean is clean” and if post clean up levels are acceptable for reentry
- 4) Coordinate environmental laboratory procedures and flow for testing
- 5) Coordinate with the federal, state and local health, environment and law enforcement agencies
- 6) Provide advice on statistically valid additional sampling strategies to identify what needs to be cleaned and whether clean-up has been successful
- 7) Implement biomonitoring for exposure
- 8) Integrate multi-media exposure information to assess the range of exposures in the population at risk
- 9) Provide toxicological prognosis to the public on short, midterm and long term health and psychological effects of the exposures they experienced
- 10) Conduct community surveillance to document short, mid term and long term health effects using standard epidemiological methods.
- 11) Develop risk communication strategies and working with stakeholders to convey information to the public in a timely and effective manner.
- 12) Support stakeholders in developing a course of action.

Preparatory Actions between Incidents

Identify possible delivery methods of contamination and the agencies and stakeholders that would be involved in each

- 1) Assure that there is a chemical and radiation 24/7 on call and call down system in place
- 2) Assure that team roles are defined and the people who can fill roles identified
- 3) Establish how the public health team will fit into the incident command structure
- 4) Drill with the agencies and stakeholders who would be involved with the various possible vectors of contamination
- 5) Anticipate the most likely scenarios and epidemiological approaches to assessment
- 6) Foster the ability to improvise with partners in unanticipated scenarios
- 7) Maintain equipment, means of communication in ways that are resilient to events that effect the main offices of the public health agency
- 8) Determine valid environmental and body burden sampling and laboratory procedures
- 9) Evaluate steps used in prior crisis and recovery

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Many of these actions are likely to involve state public health or other agency programs that are different from the programs that respond to microbial terrorism. Little emphasis has been placed on public health funding for these programs to provide them with epidemiological or other technical expertise necessary to prepare for contaminating terrorism or for the environmental agencies to prepare for the recovery phase of such events. To the extent that chemical or radiation terrorism has been considered, the discussion has focused on exotic military chemicals (Weapons of Mass Destruction) instead of readily available industrial chemicals or biotoxins that could be manufactured with ease by terrorists here in the United States. The likeliest scenarios are ones using chemicals of opportunity.

References:

¹ Science and Technology expenditure on: RN Countermeasures=\$137 million; Chemical/High Explosives Countermeasures=\$65 million and Biological Countermeasures=\$365 million
http://www.dhs.gov/interweb/assetlibrary/FY_2004_BUDGET_IN_BRIEF.pdf

² All statistics are derived from the Monterey WMD Terrorism Database.

³ Counting only plots, attempted acquisitions, possessions, threats with possession and uses.

⁴ The remainder are unknown or combinations.

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