

STATEMENT OF  
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I am Dr. Richard J. Jackson, Director of the National Center for Environmental Health of the Centers for Disease Control and Prevention (CDC). I appreciate the opportunity to summarize CDC's role in responding to chemical terrorism. As a former State public health official, I have experienced firsthand the panic, fear and chaos associated with disease outbreaks and disastrous events.

As Dr. Hughes summarized, CDC's mission is to monitor the health of the U.S. population and investigate and contain disease outbreaks, including those that are due to deliberate acts of terrorism. As with biological terrorist threats, CDC's response to chemical terrorism includes four components: surveillance and outbreak response; laboratory capacity to measure toxicants in the blood, serum or urine of people; disease prevention and control; and infrastructure and training. Whereas the Environmental Protection Agency has the lead for the effects of chemical toxicants on the environment, CDC's role pertains to the effects of chemicals on human health.

CDC responds to chemical emergencies, whenever and wherever they occur, whether the emergency is caused by an act of terrorism or an accidental release. Television has given us all the opportunity to see a glimpse of the serious impact both of these types of emergencies can have on the population of a city or country. Two such examples in recent years are the chemical plant explosion in Bhopal, India, and the terrorist attack in the subway in Tokyo, Japan. In December 1984, an explosion at a chemical plant in Bhopal, India caused an extremely toxic substance to be released into the air in an area surrounding the plant – a densely populated part of the city. In this incident, an estimated 30-40 tons of the substance were released into the atmosphere during a 2- to 3-hour period, resulting in over 3,000 dead and 60,000 seriously injured of the more than 200,000 people exposed. In the second example, in March 1995, a terrorist group in Japan released Sarin gas (a nerve agent) into the air of Tokyo's subway system. Within 24 hours of the attack over 5,000 people had sought medical attention. By the end of the crisis almost a thousand people were identified as experiencing some health effects and 12 people died. In the end, it was only the inefficiency of the mechanism used to disperse the chemical agent that prevented casualties from being far worse.

The reason I have chosen to cite these two examples today is to point out the variability of the types of chemical emergencies that have occurred elsewhere and that could occur in the United States. There are three points I would like to make about the emergency response responsibilities and capabilities at the various levels of government: 1) the nation's public health system, health officials at the local, State, and federal levels, is a critical resource aimed at protecting the health of U.S. residents whenever a health emergency occurs; 2) CDC has the expertise and capacity to respond to many types of chemical emergencies; and 3) the Federal agencies tasked with responding to chemical emergencies are discussing ways to improve our response capabilities to better triage exposed populations and communicate with our partners, the media, and most importantly, the public.

### **Public Health Role in Responding to Chemical Emergencies**

Terrorism is a community problem. Health decisions for the community in response to a terrorist event require the involvement of public health professionals from the local, state, and Federal levels. State and local public health officials will be among the first to respond to any chemical weapon attack, long before any Federal units are on the scene. It is these local public health professionals with whom CDC has had a long-term relationship. It is CDC that State and local officials call upon for help and advice in any kind of public health emergency. And, it is the State and local public health professionals who work along side the local police, firefighters, and emergency medical personnel and who have the greatest impact on the health and safety of people in affected areas.

We, in public health, also have the responsibility to protect the community of emergency responders—so that they do not become victims as well. We have the responsibility to protect the community of exposed people—to carry out surveillance, to determine who has been exposed to toxic chemicals and at what level they have been exposed, to ensure that they receive appropriate care and treatment, and to create registries during the early stages of the event to allow for appropriate long-term follow up. Lastly, we have the responsibility to protect the larger community impacted by a terrorist act—to calm the panicked and worried well with good scientifically based but understandable information and to help communities recover from the trauma of a terrorist act or chemical emergency. Experienced public health doctors, laboratorians, and epidemiologists are essential in helping communities to respond quickly and to sort out questions of exposure, treatment, and recovery.

### **CDC's Emergency Response Capabilities**

CDC has considerable experience working on all types of chemical emergencies. When a disaster or emergency occurs, CDC responds to requests for assistance from state or local agencies by helping to:

- Make a preliminary assessment of the situation either by telephone or by sending an emergency response coordinator or team to the site;
- Coordinate our activities with those of the local, state, and other federal personnel, including assistance to help protect the health and safety of emergency response teams;
- Provide assistance to help protect the health and safety of emergency response teams;
- Develop a strategy for dealing with the public health aspects of an emergency;
- Provide technical assistance in areas such as epidemiology, toxicology, and laboratory science;
- Perform any necessary laboratory tests, most of which are currently beyond the capacity of local, state, or university laboratory;

- Determine when protection, treatment, and prevention objectives are achieved; and
- Set up a program to deal with the recovery process.

Throughout the response process, CDC makes resources available to use in aiding both the short term response and the long term recovery of the community involved. We have state of the art communications equipment that allows us to provide a link between on-site and off-site responders. CDC has a staff of health communicators and educators, who are invaluable to our communications with the media and the affected and worried public. CDC has the experienced professionals, including doctors and epidemiologists, needed to triage victims, ensure medical treatment for those who are ill, and provide follow up for those who are at risk of disease. And, CDC's laboratory capacity is unique in the world in that it has the technology and highly trained professionals necessary to make measurements of chemical exposures in people.

One common thread in the laboratory component of the public health response to these tragedies is to determine **what** chemical agents were used, **who** has been exposed to the agents and to **how much**. This information is critical for appropriate medical treatment for those who have been exposed, and to allay the fears of those who have not been exposed.

### **CDC's Laboratory Capacity**

CDC's environmental laboratory is unique in that it is the only laboratory that can accurately measure more than 200 toxicants (chemicals) **in people**, not simply in the environment. Such measurement is known as biomonitoring. Let me provide an example of the value of this information and how CDC's scientific capacity helped to address a recent chemical emergency involving the pesticide methyl parathion.

Methyl parathion is illegal for indoor pesticide use because it acts as a nerve agent. Though not as strong as the nerve agent used by terrorists to kill people on a Japanese subway in 1995, it affects people the same way.

Starting in the fall of 1996, seven states—Mississippi, Louisiana, Texas, Arkansas, Tennessee, Alabama, and Illinois—became aware that methyl parathion was being used indoors to control indoor pests. Two children died. Thousands of homes were affected. In order to take appropriate action, public health officials had to determine who had been exposed and to what extent. They also had to respond to a flood of calls from people who feared that methyl parathion had been sprayed in their homes.

State and local health officials asked CDC, the Agency for Toxic Substances and Disease Registry, and the Environmental Protection Agency to help with this emergency. To quantify human exposure to this deadly pesticide, CDC's Environmental Health Laboratory developed a mass spectrometry assay to measure a metabolite of methyl parathion in urine. Through this unique test, it was possible to determine the amount of exposure a person had to this nerve agent. State and other federal officials used CDC's test to determine **who had been exposed, how much, who was at greatest health risk, and whether homes needed to be evacuated and remediated**. To date, more than 14,000 persons in these seven states have been tested - 4,000 of whom were assured they had no significant exposure. In the absence of CDC's unique laboratory capacity and diagnostic test, there would have been no way to obtain this personal exposure and health risk information. In addition to the public health benefit, CDC's test provided precise exposure information which averted more than \$50 million in unnecessary home remediation costs. The methyl parathion emergency just described illustrates the importance of precise measurements of chemicals **in people, not simply in the environment**. Similar laboratory and epidemiologic capability and response would be needed to respond to an act of terrorism.

Having such measurements means that in any chemical emergency persons truly exposed can be identified, and persons not exposed could be reassured they were not at risk. Emergency response and medical personnel can then focus their limited resources in the most efficient and effective ways possible.

### **Additional Strategies Being Considered**

In addition to the current capabilities that I have just described, CDC is working with other Federal agencies to define improved systems and technologies for responding to these types of emergencies. Some of the strategies being considered include:

- The development of the laboratory capacity to more rapidly provide critical measurements of chemical agents **in people**.
- The provision of additional training for local health professionals in order to assure that there are an adequate number of highly-trained professionals at state and local levels who know how to address and manage these chemical emergencies, including physicians who know the proper medical treatment for victims.
- The provision of training, laboratory capacity, quality assurance and quality control, along with the development of technology that can be transferred to Regional or State laboratories to aid in the response to chemical emergencies.
- The enhancement of current information and communication systems at the local, state, and Federal levels.

In closing, I would like to reiterate that public health at all levels—local, State, and Federal—is the integrating factor in our response system to all types of health emergencies. One of the most critical components of the public health response to a chemical weapon terrorist attack is the capability of state and local public health agencies. Personnel working at state and local public health institutions will be among the first to respond to any act of terrorism. Whether natural or intentional, health emergencies require an immediate response, capacity to triage victims, medical treatment for those who are ill, follow-up for those who are at risk of disease, and assistance to help communities recover from the crisis.

Thank you for the opportunity to testify today. I will be happy to respond to any questions you may have