

Spheres of Influence

Natural Disasters and Man-made Responses: Are We Protecting Environmental Health?

When a natural disaster strikes, such as a hurricane, flood, earthquake, or tornado, it leaves behind a highly visible trail of destruction: buildings reduced to rubble, trees upended by their roots, or great gashes in roads and sidewalks. As difficult as it may be to respond to those visible consequences of calamities in the hours after the disaster occurs, less visible consequences of natural disasters may be even more difficult to address: possible diseases from contaminated water, air pollution hazards from burning debris or exposure to chemicals released from commercial facilities, health effects from hazardous waste sites or pesticide-contaminated fields.

The public health aspects of a natural disaster, including environmental health, are the responsibility of the Office of the Assistant Secretary of Health, which, through Public Health Service's Office of Emergency Preparedness (OEP), coordinates the public health response to natural and man-made disasters. Specific activities are assigned to the various Public Health Service agencies such as the Centers for Disease Control, the Food and Drug Administration, the Health Resources and Services Administration, the Indian Health Service, the National Institutes of Health, and the Substance Abuse and the Mental Health Services Administration. Additionally, OEP serves as the coordination point for the disaster response and recovery activities of Social Security Administration, the Administration on Aging, the Agency for Children and Families, and the Health Care Financing Administration.

OEP's role, and the role of other federal agencies and departments, are outlined in the "Federal Response Plan," crafted in response to the Robert T. Stafford Act of 1988, which establishes federal authority to respond to natural disasters and emergencies declared by the president. The Federal Response Plan assigns specific response issues, known as emergency support functions, to agencies best equipped to perform particular tasks. For example, EPA has the lead responsibility for controlling hazardous materials that may have been released during a disaster, while the Department of Transportation has lead responsibility for transportation-related issues, including transportation necessary for other agencies to assist states. The Federal Emergency Management Agency

(FEMA) coordinates the overall federal response.

Environmental health encompasses a full range of public health matters including water quality and sewage treatment, chemical pollution, and control of vector-borne diseases, according to Frank Young, director of the OEP and the National Disaster Medical System, which is a cooperative effort of the Department of Health and Human Services, Department of Veterans Affairs, Department of Defense, FEMA, state and local governments, and the private sector.

Young commented that agencies responding to emergencies would benefit greatly from stronger knowledge beforehand about the health effects of certain environmental conditions, such as air pollution from chemical fires, before the response action is undertaken. "We're doing things that we hope will be appropriate," said Young, though the actions are not always "backed by actual data." For example, when PHS was asked to assist with identifying and analyzing the possible health effects from the Kuwaiti oil fires, Young said no baseline urine or blood samples existed against which to measure the extent of chemical exposure from the fires. As a result, health studies after the fire could not accurately assess the impact of the fires on an individual's health.

To gather and understand data related to natural disasters, NIEHS is becoming increasingly involved in the early stages of a disaster. Kevin Tonat, assistant to NIEHS Director Kenneth Olden, has been detailed to OEP to serve as Young's assistant, and NIEHS has been involved early on in the Midwest floods.

Young said research needs go unmet because funding levels are inadequate. "There's a difficulty of obtaining funds to do disaster-related [environmental health] research work," he noted. Only at CDC has environmental health research in the disaster context received measurable funding, according to Young.

Ed Berkey, director of the Center for Hazardous Materials Research at the University of Pittsburgh Trust, believes that natural disaster planning has not adequately addressed environmental health questions, in part because the risks are amorphous compared to obvious risks from collapsing buildings, malfunctioning

sewage plants, or spoiled food.

The Midwest floods revealed for the first time "a gap in the planning process," Berkey said, which is focused on tangible, immediate risks. Emergency management organizations such as FEMA are understandably and appropriately focused on "saving lives and protecting property," Berkey observed.

The flooding in the Midwest produced environmental consequences and possible health effects that could not easily have been foreseen or quantified, Berkey said. He cites the example of exposure to contamination from uprooted petroleum tanks or from run-off from pesticide-laced fields. Such situations pose potential health effects, however serious, rather than the more certain health impacts of bacteria-contaminated water or spoiled foods.

Berkey said emergency management organizations aren't well positioned to carry out environmental responses associated with natural disasters, nor are environmental responses during national disasters "high on the agenda" of environmental agencies. Emergency planning, he said, has not fully incorporated the "interrelationship between environmental and emergency planning." However, Berkey said, "every time there is a major disaster, agencies do improve their ability to respond, even though the disasters never seem to be exactly alike."

Ken Stroech, director of special preparedness for EPA, disputes Berkey's assertion that environmental issues are not fully integrated in natural disaster planning. Under the Federal Response Plan, EPA has primary responsibility for responding to emergencies involving hazardous materials, though 15 other agencies also play a role.

Stroech does agree that massive disasters like the floods require an adjustment in the planning process, and he acknowledges that large-scale disasters reveal the difficulties of forcing emergency needs into specific categories that are under the purview of specific agencies. "Some of these issues just can't be put into an ESF [emergency support function] box, they cross categories," he noted. For example, the floods have produced a need for comprehensive monitoring of air, water and soil. Air monitoring is necessary partly because sediment left from receding flood waters turns into airborne dust and because of the burning of flood-related debris. The debris issue is not included in the hazardous materials emergency support functions over which EPA has primary

responsibility, but it is included under the public works category which is assigned to the Defense Department and the Army Corps of Engineers. The health effects of the environmental exposures fall under the purview of both EPA and the Public Health Service, Stroech noted.

Although "we have found that things didn't sandwich in as neatly as they have been designed to," Stroech said, the overlapping jurisdictions of the agencies have not posed a significant problem. "We have good cooperation and coordination," he said. And, Stroech cautioned against overemphasizing the situations that didn't fit neatly within the Federal Response Plan framework, saying "generally, the structure works."

Even without a presidential declaration of a disaster area and the activation of the Federal Response Plan, EPA has the authority to respond to hazardous materials-related emergencies, Stroech noted. Emergencies such as oil spills, train derailments, or releases from chemical plants or refineries occur on a frequent basis, Stroech said, but typically are handled by local and state authorities and by regional EPA offices.

EPA's national emergency response officials become involved only in unique or especially significant cases. Incidents that draw a lot of press attention, cross EPA regional boundaries, or raise new policy questions might prompt EPA to become involved at the national level. "It would be impossible to write a rigid set of standards" that would trigger national involvement in an event, Stroech said.

A similar view is offered by Lois Gibbs, executive director of the Citizen's Clearinghouse on Hazardous Waste. Gibbs, the former homemaker from Love Canal who organized other homeowners and won state and federal relief for chemical contamination of their properties, agrees that a rigid set of national standards for triggering emergency actions would not be feasible, largely because the health risks associated with many chemicals are not well known and because different communities have different environmental laws. "To set national criteria for emergency actions would be difficult," Gibbs said. "We're talking about 60,000 chemicals," whose toxicity is not well known, compared to the obvious consequences of floods or hurricanes.

Gibbs continued, "There's just so much that we don't know about human health risks." When communities believe they are faced with imminent danger and seek immediate relief, those requests "always become controversial," and embroiled in the "debate over how toxic is toxic," she said.

Gibbs believes that, as with the Love Canal controversy well over a decade ago, state and federal officials resist conceding that hazardous waste sites pose health risks. State and federal authorities, she said, "are only responsive to those who create the political will." According to Gibbs, citizens who are sophisticated about government policy and agencies will be able to create that will quicker than citizens who lack such sophistication.

Victims of natural disasters are less likely to face disparate treatment than are victims of chemical or other environmental incidents, Gibbs believes. Still, a formalized policy mandating certain kinds of actions in certain circumstances might well make it even more difficult for citizens who believe they are endangered to receive protection or relief, she said.

Although the public health aspects of a man-made disaster are, under the Stafford Act, the responsibility of OEP, thus far no man-made disasters have triggered the Stafford Act and the Federal Response Plan. However, the Superfund Program permits a federal response to any release of hazardous substances (except oil spills) and such responses are made almost daily under Superfund. The Clean Water Act allows a federal response to oil spills of petroleum products into U.S. waters or navigable boat ways in the United States.

How OEP responds to a natural disaster depends on the character of the disaster. According to OEP's Kevin Tonat, "We try not to just react and take a 'cookie cutter' approach, but to tailor the response to the need. Needs are identified through a combination of inputs from the states, the PHS regional emergency coordinators, and other sources of on-site assessments."

In 1988 when Hurricane Hugo wiped out the hospital in St. Croix, a mobile hospital was provided through the National Disaster Medical System. Under the National Disaster Medical System, federal and nonfederal medical personnel, facilities and equipment are mobilized to provide medical care in the event of war or domestic disasters. The hurricane also wiped out housing for St. Croix's hospital staff, which prompted the Public Health Service to provide tents. During this summer's Midwestern floods, hospitals were not significantly damaged, eliminating the need for emergency facilities. But the affected states did need additional resources to assist in sorting out environmental health concerns, especially concerns about the safety of the water supply and controlling vector-borne diseases.

Although states are usually well equipped to cope with crises on their own, when a disaster outstrips a state's capacity to respond, state officials may not necessarily

know the kinds of federal assistance available, Tonat commented. For this reason, during the floods, he, Young, and representatives of the other federal agencies met with state officials to brief them on federal resources. A technical assistance group, representing Public Health Service subunits, began to further identify state needs and provide assistance. Representatives of the Health Care Financing Administration assessed the impact on Medicare and Medicaid, NIEHS personnel offered environmental monitoring assistance, and CDC uncovered a need for a comprehensive reporting system in Iowa which would enable state officials to assess the status of water, sewer, and public power systems statewide. Over 35 Public Health Service sanitarians, environmental health specialists, and engineers were deployed to the area to provide hands-on assistance to states.

The leadership and technical assistance groups enabled OEP to determine state needs and how the Public Health Service could assist with those needs, Tonat said. "Sometimes states are not aware of what to access from the federal resources or how to request them," he noted. "States have to request assistance; we will not go in without it," he said. And, initially, states may believe they have a disaster well in hand. "Sometimes a state's first reaction is to think they don't need help," Tonat said. "It's like a pop fly, with various parties saying, 'I've got it.'"

OEP has begun to take a more proactive approach since Hugo, as with hurricanes Andrew in Florida and Emily in North Carolina, by dispatching personnel to the states before the storm hits and letting officials know what resources are available. Although the Federal Response Plan clearly outlines the kinds of assistance available to affected areas, Tonat noted that the plan is still rather new, having just been printed when Hurricane Andrew devastated South Florida. "It is a challenge to go through the education process with every organization involved with emergencies in all 50 states, but FEMA is trying to do it," said Tonat.

If states are sometimes less than familiar with all the services that other federal units can provide, they are usually well aware of the services offered by CDC, according to Kent Gray, chief of CDC's emergency response coordination group. "States have a much better feeling about the kind of help they can get from CDC. We do more work with the states in ongoing programs," than other subunits of the Department of Health and Human Services, and he agreed that there is a "general haziness among states about what the federal government can do" to help.

Under FEMA, OEP relies on CDC to establish surveillance systems to monitor the general population and high-risk populations, to carry out field studies and investigations, monitor injury and disease patterns and potential disease outbreaks, and to provide technical assistance and consultations on disease and injury control measures and precautions. The CDC is also assigned the task of assessing health and medical effects of exposures to chemicals and biological agents and advising on protective actions, as well as providing public health and injury prevention information to the general public in areas affected by a disaster.

When a disaster strikes and CDC is called to respond, it relies on the state's assessment of the kinds of help it needs. "We start out with a discussion, determine

what the situation is, what resources are available, and the issues they are facing," Gray said. Then based on that discussion, a CDC emergency coordinator may need to do no more than provide technical assistance over the phone, such as conducting a literature search. But, if a state needs additional epidemiologists to "help them define the magnitude of the problem," CDC personnel will be dispatched to the state, Gray said. Whatever aid CDC provides must be no more or no less than what a state requests, Gray stressed. "We bring just what is required to meet the need," he said, though CDC knows that the state's assessment may change at any time.

When CDC officials are brought in,

they may be able to offer a more objective assessment of a situation than state or local authorities, said Gray. And, because they are well versed in the federal emergency response system, CDC may be able to bring federal resources to affected communities more promptly and to prepare for future health-related impacts from a disaster. For example, in the Midwest floods, the "vector-borne disease issue won't arise until next year or the year after," Gray said. "So the flood is not over from an environmental health standpoint. We always learn something from every event. With those lessons, we move on to the next situation."

Karen Breslin

Karen Breslin has previously written for *EHP* on the health effects of hazardous waste.



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