

**2017**

## **Chapter 14**

### **Hazard Communication - Managing Crises**

Local health directors often face crises within their communities. Some are common, such as a report of two or more children with meningitis, or an outbreak of as Hepatitis-A. Most health directors can handle public reaction to such issues with little difficulty. Other less common problems, occurring more frequently are crises related to fear of dread diseases caused by environmental exposures. The common problems rarely cause a crisis, because they occur often enough that they don't raise much media curiosity, although it can happen. For example, several cases of hepatitis-A may occur during peak vacation periods in communities where tourism and eating out are major industries. Travelers, not knowing the community can react in panic. Appropriate intervention, such as that which occurred during such an incident in Virginia Beach, Virginia in the mid-1990s is a model of prevention.

One of Virginia Beach's major industries is tourism. It is important economically. An outbreak occurred after several people ate in the same fast food restaurant, and some 10 days later all went to the same emergency room feeling sick. The physician on duty correctly identified hepatitis and notified the health department. A health department epidemiologist obtained information from the victims and identified a possible common source of infection. She arranged for sanitarians to inspect the restaurant. A food handler had been sick and probably transmitted the disease. The news media were alerted, given the facts, and asked to help alert patrons who used the restaurant and ate suspect food when the disease might have been transmissible. The restaurant management helped provide information about the outbreak and was willing to pay for treatment with gamma-globulin injections for those at risk. The elected officials were concerned about a possible adverse effect on the community during the tourist season. There were some scare stories in several northern and Midwestern newspapers.

The restaurant chain affected, the restaurant industry in the state, the local and state health department, local officials, and other interested individuals were all briefed within twenty-four hours of identifying the problem. The local news media helped feed correct stories to their counterparts in those areas of the country where most of the tourists came from. All restaurants made concerted efforts to enforce good food handling procedures. Stories on the transmission and prevention of hepatitis-A and other fecally distributed diseases were given front-page treatment by the local TV, radio, and the newspapers. It was made clear this was a single incident. The hospitals and doctors kept track of new cases of the disease. A daily tabulation of cases and their probable origin was provided. No one tried to cover up the incident. All were open and free with information. Good relations between the health department and the media ensured that the information about the outbreak and other information available from restaurant inspection sheets confirmed that food sanitation in the community was excellent, that occasional incidents could occur and that if they did prompt action could and would be taken to control them.

Since this incident, the community has been more sensitive to the need for widespread personal hygiene and careful food handling in public places. In retrospect, the food handler probably became sick due to transmission of hepatitis-A from a child infected at a day care center. As further epidemiologic data was uncovered additional emphasis was placed on the need for good hygiene in day care centers and restaurants. Openness, trust, quick action, and good communications prevented a panic and potential damage to the community's economy.

## **Love Canal**

In contrast to the previous example of successful management of a potential public health crisis has been the management of many environmental crises where good epidemiology and scientific data were lacking, and the media were not given a chance to develop trust. Because of lack of information the news stories dealt with the public's feelings and perceptions rather than possible scientific explanations. Public officials exhorted the community to believe there was no problem, without a basis for such belief having been prepared. The Love Canal crisis was an example of poor management. In this incident several young women, comparing notes, found they had all suffered stillbirths. While they were looking for a reason, television news broke a story about their homes having been built on an old landfill, containing waste chemicals. When the issue was first raised, rather than listening carefully to the complaints, making an investigation and holding carefully managed meetings to provide information about the frequency of stillbirths among the population at large, or in the local households, these women were given the impression they were imagining problems that didn't exist, and that public officials didn't care about them. The city of Niagara Falls was seen as trying to cover up its action in buying the land from the chemical company and allowing its use for a housing development. Twenty plus years later, after many studies, and millions of dollars, including a comprehensive study by the CDC no links have been found between perceived health effects and any evidence of disease.

The Love Canal crisis occurred at a time when people were starting to hear about the ill effects of chemical contamination of the environment. The detrimental effects of DDT on pelicans and eagles had been brought to light shortly before. Because the disposal area was literally covered up it became a "cover-up" issue in the media. The wastes had been "dumped" into an unprepared site many years before, when knowledge about leaching and proper preparation of disposal sites was minimal. Those affected still believe, many years later, that they were injured, in spite of the millions of dollars spent to investigate the possibility of disease and inability to find any firm evidence of disease due to the chemical exposures. In contrast to the outbreak of hepatitis in Virginia Beach; a real outbreak, with real sickness, and a clear chain of transmission this episode was one where the individuals believing themselves affected were not provided good scientific data to tell them that their experience was not different to that of many young women around the country, where there was no exposure to potentially toxic chemicals. No one bothered to tell these ladies that just because a chemical can be measured in the soil it has to get into the individual's system in amounts large enough, and stay there long enough, to cause harm. The acute toxicology of most chemicals is well known from animal experiments. Long-term toxicology of workers in chemical plants has identified by many prolonged occupational health studies.

One difference between the Virginia Beach outbreak and the Love Canal exposure, not appreciated at the time, was the unwillingness of many people to believe state and federal officials knew anything about possible exposures to toxic chemicals. Another problem was the strident call for proof that very small doses of chemicals over long enough periods could not, under any circumstances, be responsible for the stillbirths. Being the first major confrontation of this type the local officials were not prepared to point out that you could only prove a compound causes a problem; you cannot prove it does not. First, there is the ethical problem of exposing people to a compound that might cause such harm as a stillbirth. Secondly, there is the problem of ever finding enough people (often thousands or tens of thousands) to take part in a project that could measure a small but significant effect, if it occurred. None of the staff of the local, state or federal agencies were prepared to argue that the effects of a compound, on cells in a Petri dish (salmonella mutations) or on mice or rats could not be simply extrapolated into human effects.

## **Triani, Alabama**

Subsequent to the Love Canal incident there have been many other "toxic exposures"; such as those to DDT in Triani, Alabama, or to Dioxins in the soil at Times Beach, Missouri. At Triani, a small village on the bank of the Tennessee River, near Redstone Arsenal, most of the people

worked in an old military building leased to a company to make DDT. This occurred after the World War II, when there were few restrictions on the disposal of waste chemicals. The DDT escaped into the Tennessee River in large quantities and settled in lumps. The game fish, passing the contaminated water through their gills, had their fatty tissues loaded with DDT. Many townspeople used these fish for a third or more of their diet. Concurrently workers in the factory took many pounds of the chemicals home to use in their gardens. Familiarity with potential hazards breeds contempt for them. Between the fish and the gardens many people ate foods containing the DDT for years. Because a town official had some chronic problems he selected himself, and several relatives for testing to detect DDT in their tissues, by the Centers for Disease Control (CDC). The tissues came back with levels higher than any found in previous occupational health studies. The mayor gave this information to the townspeople and the Army was immediately accused of poisoning the community - although their only role was to lease a building to the producers of the DDT many years before. Every illness in the inhabitants was blamed on the DDT. No one was prepared to listen to information that the DDT was possibly not the cause of the illnesses. As at Love Canal, lack of quick action to show interest and belief, or to show willingness to investigate, or to call on local and state officials to provide an epidemiologic analysis of deaths and illness in the community, or to call for an independent investigation led to the issue being blown out of proportion. The CDC agreed to test the entire community for DDT and attempted, through a series of physical and chemical tests to figure out if the community had a different health status from communities similar by age, race, and sex except the exposure to the DDT. The results, when finally published, described no clinically significant physical findings other than a statistically significant rise (but not clinically significant) in systolic blood pressure of 2 mms.

### **Times Beach, Missouri.**

At Times Beach Missouri, company collecting used oil, including oil mixed with dioxin used as a cooling agent for transformers, disposed of the oil by spraying it on earth roads to control dust. After some vague illnesses, and seeing the oil laid down, and having heard about the high toxicity of dioxin, some citizens called the EPA. The first action of the EPA was to tell the community about the toxicity of dioxin. Neither the spreader of the oil, nor local or state health officials, provided any of the information known by occupational health specialists about dioxin. Although dioxin is harmful to certain animals and aquatic life, other than liver poisoning if exposed acutely, dioxin has not been shown to cause danger to humans except for severe acne. When the citizens heard from EPA they called the news media and pressured the state to ask the EPA's help. Based on an assessment of political necessity rather than science the state agreed to buy the housing and move the people. The EPA brought people in "moon suits" to remove the contaminated earth and send it to a hazardous waste disposal site, adding fuel to the perceptions about the dangers of dioxin. Since then, studies have been made that failed to show any ill effects among the people exposed to the oil. The problem occurred in a small community where immediate epidemiological evaluation was unavailable, and where human toxicological data was not provided in terms the local people could understand. When data was available, because of the media circus, the citizens would not have believed anything other than how dangerous their living conditions were. This was a situation that in retrospect could have been defused, and could have used a less expensive way to manage the environmental hazard. Huge sums have been spent to deal with a situation that probably could have been controlled by using available epidemiological information about the effects of dioxin on people as opposed to fish.

### **National crises.**

Since the local incidents at Love Canal, Triani and Times Beach, national anxiety about contamination of food with EDB and ALAR have caused increased concern about our "chemical environment" A current 'Crisis' is that of the use of Bisphenol-A in plastic baby bottles.. Many chemicals have acute toxic effects, some only in high doses of parts per thousand, others with a much smaller dose. The effects of chronic exposure are very different. The best long-term epidemiologic studies on humans are from occupational health exposures of workers, or from

accidents such as the large release of dioxins at Seveso, Italy. Excellent protocols for Health Hazard Analyses (HHAs) have been developed from occupational health studies. Although workers are considered to be exposed for only 40 hours a week, many of these HHAs have been extrapolated to estimate the effects on the non-working population, assuming people are exposed to chemicals twenty four hours a day, three hundred and sixty five days of the year.

### **Environmental policy making**

Many chemicals have been branded as dangerous to health and removed from the market, despite scant scientific evidence. Under political pressure, the EPA has often made claims about hazards of chemicals to people, not supported by subsequent studies. Part of the difficulty in assessing the likelihood of chemicals causing public harm has been the expectation of many in Congress, and among their supporters, that no one should be placed at harm by any compound to which the public might be unwittingly exposed. Many claims about health hazards are based on studies of the way compounds affect cells growing in a Petri dish, or from studies of animals exposed to huge doses of chemicals that are often thousands of times higher than any dose to which people would be exposed.

Claims of carcinogenicity are based on a federal law known as the Delaney amendment to the FDA Act. Congress had demanded that EPA use the standards promulgated by FDA for controlling food additives and drug standards, despite lack of scientific evidence that people exposed to many of these non-drug and non-food compounds have ever been harmed. The Delaney amendment was repealed in 1989.

The health hazard assessment of chemicals requires the knowledge and application of the principles of toxicology, cytology, pharmacology, mutagenicity, fetotoxicity, biostatistics and epidemiology of humans, as opposed to animals. The epidemiologic analysis is usually based on occupational or accidental exposures. People, in their homes, are not exposed to the same levels or by the same routes as workers. Most of the studies on workers should only point to potential problems for the public, not be taken out of context by inappropriate extrapolation

Two special examples of claims about hazards to people are made for asbestos and radon. The asbestos studies were based on exposures to people working in small steel rooms, aboard destroyers being built during World War II. There is no doubt that these exposures led to many cases of lung cancer. Still, these exposures should not be extrapolated to apply to exposures of general people or children living or working in buildings using asbestos ceiling or floor tiles. Similarly, the exposures of miners to radon, while working in uranium mines are not suitable for extrapolation to suggest potentials for developing cancer from radon leaking into homes from the natural underlying terrain. Unfortunately, many studies performed by the scientific community, and published in peer reviewed journals describing the lack of evidence of hazard do not make nearly as much news as a potential but unproven hazard.

### **The Health Department as Advisor.**

In the future, health and program directors should provide their communities with analyses of the potential health effects of chemicals more frequently. As the analysts of community health and illness, they need to know the basics of human toxicology, particularly what a particular concentration means when a chemical has been found in the soil, water or air. They must act as advisors to other community agencies; to see that chemical removals are managed so that they do not contaminate the aquifers, surface water, or air. Although regulation of control of chemical use in the environment may be handled by another agency, health directors should be the people who provide the community with information and reassurance about potential hazards.

Health departments will face more and more problems with the disposal of household and industrial wastes. Many urban communities are running out of land to use as

landfills. Department staff must know the elements that go into construction of a modern landfill. The directors and their staffs must make a major effort to help the media and public understand that the difference between a landfill and a "dump" is the application of advanced engineering and environmental protection techniques to construct a landfill and protect the ground, whereas a dump is the collection of garbage and debris on unprepared land. The department's staff may have to act as facilitators in persuading warring neighbors to work out their differences and find a landfill site or provide alternatives to burying waste. Be familiar with recycling and its costs. In Europe many communities require household waste to be separated into glass, paper, wood, metals and putrescible products. The staff should know how to reduce waste by incineration (without causing air pollution) to extend the lifetime of a landfill.

## **Landfills**

Although landfill construction may be permitted by some agency other than the health department in some states, local health directors should be prepared to advise their city or county manager about the standards needed to protect the environment when the community authorizes someone to construct a landfill for them. They must understand the value of monitoring and recycling wells. Information about who lives near the landfill site, and what businesses are in the neighborhood, must be gathered. Agrochemical data are needed before any work is done, so that environmental changes from leaching can be detected immediately, if they occur. Baseline data on morbidity and mortality in the area will enable you to evaluate complaints that a new waste disposal site is affecting people's health. Remember that the absence of illness cannot be proved, only its presence. In one state where I was a local health director the state's hazardous waste disposal site was located the county where I was the health director. It was in a relatively remote rural area of the county. The site manager lived near the landfill to show that neither he nor his family was concerned about any potential health hazards. In spite of offers of tours of the site with explanations about the system used to protect the community, local farmers complained they and their livestock were adversely affected. The data I had on deaths and longevity of people showed that those people living within walking distance of the landfill (allowing for a long walk) lived longer than the average for the community and their cancer rates were lower than the community's average. There was no way to explain the scientific issues to the farmers; they appeared to have other concerns. However, this data was very useful and consoling to the elected officials from the region. It is interesting that the uranium mine on a small island in the middle of the community's water supply never bothered them. The media were provided the same data given to the farmers and most of the stories about the danger to health from the disposal site disappeared.

## **Disaster Planning.**

The public is bombarded daily with news about our chemical environment and how dangerous the things we eat, drink and breathe can be. Health department staff should not get their scientific expertise from television, magazines and daily newspapers. Health directors can target journals to be read by their staff and develop brain-storming sessions around current issues. They can circulate and annotate journal articles, attend state and national meetings on the environment, learn about the costs and benefits of new technology, and most importantly, are prepared by planning for crises. A crisis management team can be formed in the department, and other experts can be enlisted. For instance, the University of Virginia has an environmental negotiating team. This team is funded from fines paid by Allied Chemical as part of its settlement for polluting the James River with Kepone. One's ability to deal with crises, environmental or otherwise, depends on having credibility within the community. Being open without being an alarmist is vital. A good emergency room physician or triage specialist can walk into the midst of carnage and confusion and bring order. Similar onlookers, families of victims, newsmen, or those interested in manipulating the situation are present when community health crises occur. In my experience, health directors and their staffs should be able cope with community crises the same way an emergency room physician deals with trauma.

When health department staff are provided an opportunity to become skilled in 'Hazard Communication' they should take it gladly, to avoid their becoming part of the problem when such a communication need arises, as it will inevitably.

### **Environmental Terrorism.**

This may take form of acts such as the 2001, Sept 11 airline crashes into the World Trade Towers, movies such as Jane Fonda's movie after a non-injurious release of gases from a Pennsylvania nuclear power station, PETA's invasion of research laboratories, Tree lovers insertion of spikes in trees to injure loggers, or baseless lies about chemicals, released by the Ralph Nader groups such as the supposed dangers of Alar used to control infestations in apples. As Commissioner I and my staff spent countless hours, and lots of money that could have gone to immunizing children or providing prenatal care, to deal with public anxiety, often driven by poor media reporting on the Alar incident, or repeatedly on concerns about the health dangers of electric transmission lines, effect of CRT emissions, supposed neurological dangers of cellular phones, and the supposed ill effects of immunization. These are all fueled by perception. It is much easier to arouse public fear than to dampen it. Since 9-11 the federal government has provided significant additional funds to state and local health agencies to improve their planning for early detection of, and counters to, bioterrorism. The skills and tools developed for this issue can be applied to many health hazards and should transform our ability to deal with the issues discussed above, although this is dependent to a great degree on state and local planning competencies.. Failure of planning showed in the New Orleans flood after the 2005 hurricane. Virginia, in 2009, was judged to be one of three states with an A rating for its All-Hazards approach to [emergency preparedness](#).

### **Recommended Reading:**

1. Committee on Risk Perception and Communication, National Research Council: Improving Risk Communications. Washington DC, National Academy Press, 1989
2. Committee on Scientific and Regulatory Issues underlying Pesticide Use Patterns and Agricultural Innovation. Washington DC, National Academy Press, 1987
3. Ottoboni MA: The Dose Makes The Poison. Berkley, Vincente Books, 1984
4. Rodansky D, Stadler DR(Ed): Indoor Radon and its Hazards. University of Washington Press, 1987
5. Slovic, Paul, Address to IOM, annual meeting 2003 on risk perception as part of the study of the population's mental health. 2005) Turnock, B. Essentials of Public health, 2<sup>nd</sup> Edn (2007) Chapter 5. Health Emergency Preparedness and Response.