

DO BROADCAST METEOROLOGISTS HAVE A ROLE DURING A RADIOLOGICAL OR NUCLEAR PUBLIC HEALTH EMERGENCY?*

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INTRODUCTION

In recent years, there is an increased awareness of the possibility of terrorism attacks involving radiological or nuclear materials. The U.S. Department of Homeland Security has identified 15 plausible scenarios against which federal agencies are to develop the capabilities to respond. Two of those scenarios involve a terrorist event using an improvised nuclear device (IND) or radiological dispersal device (RDD). In addition, estimates of the likelihood of a nuclear terrorist incident in the U.S. range from 20-29% for the next decade (Lugar 2005 and Bunn 2006). In the case of an IND or RDD or any other technological or natural emergency involving radioactive materials, the responsibility to provide public health support is tasked through the National Response Framework (NRF) to the U.S. Department of Health and Human Services (HHS). HHS has subsequently delegated many responsibilities (particularly education and radiological population monitoring) described in the NRF's Nuclear/Radiological Incident Annex to the Centers for Disease Control and Prevention (CDC). CDC's role is specifically to (1) prepare state and local health departments to respond to a radiological/nuclear event, and (2) assist these agencies during such a response. In a radiological emergency, CDC will assist state and local health departments with radiation exposure/contamination assessments, field

investigations, and advise on protective actions related to indirect and direct human and animal exposures. The types of events that may involve radiation include (1) nuclear incidents such as a targeted attack on a nuclear facility, a nuclear weapon, or an improvised nuclear device; (2) radiological dispersal devices such as a "dirty bomb" or dispersion in air or by liquid; or (3) covert placement of a high-energy radioactive source in an area where people would be exposed without their knowledge ("silent source").

AUDIENCE RESEARCH

To fulfill its role as a primary federal agency for radiological and nuclear emergency preparedness and response, CDC has been working to assess the needs of its constituencies and audiences, develop training and education for these audiences, and conduct outreach to professional audiences with these materials.

In 2003-2004, CDC, through the Association of Schools of Public Health (ASPH), conducted formative research to guide development of messages and materials related to terrorism emergency preparedness topics, including radiation (Becker 2004). One of the most intriguing findings from the ASPH's focus group research was that individuals, particularly emergency responders, would look to local meteorologists to provide information about how radiation might spread following a radiological emergency event. Although not expressed as directly, in earlier focus group research conducted by another contractor, members of the public also indicated they would be concerned about wind

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direction and other weather patterns that might affect spread of radiation during such an event.

It was unclear whether meteorologists with local and national television stations are aware that they would be considered a credible source of important information during a radiological emergency event and whether they would have sufficient knowledge of radiation basics to provide appropriate guidance to local populations. The focus group findings indicated that it would be extremely valuable for CDC to establish partnerships with meteorologists to ensure that they understand their potential role in a radiological emergency and that CDC can meet their needs in fulfilling this role.

In addition, CDC and other federal agencies would benefit from working with meteorologists in such an event to estimate areas that will be affected and assess potential public health impacts of the radioactive materials.

CDC ROUNDTABLE WITH METEOROLOGISTS

To follow up on these findings, CDC held a small roundtable in August 2004 to get input from meteorologists about their role in a radiological emergency, how CDC might partner with local and national meteorologists in pre-event planning as well as during an emergency, and what channels could be used for outreach to other meteorologists and their media employers. The roundtable included eight participants from local and national media outlets, the National Oceanic and Atmospheric Administration (NOAA)/National Weather Service, the Georgia Emergency Management Agency, and the Federal Emergency Management Agency, in addition to CDC representatives from the Radiation Studies Branch, the Office of Terrorism Preparedness and Emergency Response, and the Office of Communication.

At the roundtable, Dr. Bruce Hicks, representing NOAA, provided a historical overview of dispersion, discussion of the inaccuracy of some forecasting, and description of the need to combine forecast models with visual data. Some of his key points were:

- The history of meteorology and disaster prediction goes back to the 1800s when Louis Pasteur did a study on how emissions from London affected people in southern France.

- Over the years, gas warfare, nuclear weapons testing, Three Mile Island, Chernobyl, and other events have provided significant meteorological data.
- Volcanic ash can aid forecasters in verifying models and predictions.
- Chernobyl came as a wake-up call. The near-field picture as well as the distant fallout pattern was exceedingly complex. The contaminated area was larger than the footprint indicated, and was determined not only by the wind but also by rain.
- In 1987, the Department of Defense realized the United States needed a better understanding of dispersion. Numerous studies have looked at dispersion patterns. The concept of a simple, ordered plume is not realistic.
- The National Weather Service has 122 forecast offices across the country and can access capabilities online through the National Center for Environmental Prediction. Models can show where a predictive plume, such as from a forest fire, will go.
- The best way to move the science forward is to put material on the web. NOAA's web site is a good reference: www.arl.noaa.gov/ready/er.html. Forecasts for every nuclear reactor around the world are online at all times.
- Under the World Meteorological Organization, plume forecasters from eight countries provide predictions in the event of a nuclear episode, and run trials to monitor systems and improve forecasting products.
- Models cannot accurately predict concentrations regarding the place, time, and space of plume dispersions, especially in areas of open terrain where local variability is dominant. Models need to be improved to factor in different wind dispersions or to input more meteorological data.
- Forecasting is enhanced by visual observations. Obtaining information from someone local and on the ground is exceedingly important.

Participants were then asked to consider several questions:

- How would you characterize your knowledge regarding radiation or radiological emergencies?
- What role do you think you would or could play in a radiological event?

- Would you be interested in having a professional partner such as the CDC Radiation Studies Branch if you were to take an active role in an event? What would that relationship look like?
- What information or training would you like prior to an event? What information would you be comfortable passing to the public during your broadcast?
- Should this idea be promulgated to the regional or national level?
- What do you see as the next steps in developing such a partnership?
- What science or processes for management of a radiological event might the meteorology community bring to the table?

It was noted by participants that the meteorology community is mostly unsung and unseen. The public at large is not aware of NOAA, geodetic surveys, dust clouds, and airborne and environmental forces. Yet, Doppler radar, wind shears, and storm cells are terms that the American public knows and attributes to meteorologists. CDC's interest is in expanding that knowledge base and using the credibility of meteorologists to build resilience in this era of terrorism. CDC is seeking to develop a partnership with meteorologists because they already incorporate public health messages in their broadcasts on such topics as ultraviolet (UV) radiation, pollen counts, and the appropriate clothing to wear for weather changes.

There was consensus among participants that they have limited knowledge about radiation and that a radiation event would produce great fear among their newsroom and media colleagues. Other observations made by the roundtable participants were:

- Effective communication is essential before, during, and after a radiological or hazardous event. There is a dire need to educate meteorologists as well as the public about radiation.
- The National Weather Service has an effective template to communicate about potentially hazardous weather. CDC should consider tapping into this network to deliver emergency communications.
- Regarding emergency messages, CDC should seek to:
 - deliver communication in a standardized, consistent way

- provide simple, graphic communication for immediate on-air adaptation
- provide research information regarding safety and protective actions
- To explore this issue at future meetings, other persons who should be at the table in addition to meteorologists might include GEMA representatives, local emergency managers, radio and TV station managers, and broadcast station health reporters and physicians.

NEXT STEPS

Communication is a vital component in an effective public health response. During and after a radiological or nuclear emergency event, public health officials will need to communicate with the public, policymakers, and the media. The public considers meteorologists to be trusted, non-political broadcasters. CDC continues to seek their input on how it can effectively partner with them, and how, in turn, the CDC can assist meteorologists in partnering with other public health and emergency organizations.

CDC has developed extensive radiological information and training materials, which is available on its website at <http://www.emergency.cdc.gov/radiation>. In addition, we are developing a media kit for broadcast meteorologists, health reporters, and other media staff. We invite specific comments on these efforts as well as other suggestions, which you can provide by e-mail to rsb@cdc.gov or calling the Radiation Studies Branch at 770/488-3800.

SUMMARY

Broadcast meteorologists already play an important public health role, and can potentially play an even greater role in a radiological or nuclear emergency event by keeping the public informed about the path of radioactive contamination, providing important public safety information, and calming fears with accurate information. Forming a strong, sustainable, partnership between broadcast meteorologists and CDC will make a significant difference in public health education and outcomes. Together, we can meet the challenges and prepare to work in unison in order to save lives and mitigate added injury from a radiological event.

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