

# Community Engagement and Case Analysis Methods for Developing Post-Incident Risk Communication Strategies for Intentional Biological Environmental Contamination Incidents

FINAL REPORT



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Community Engagement and Case Analysis Methods for  
Developing Post-Incident Risk Communication Strategies for  
Intentional Biological Environmental Contamination Incidents

U.S. Environmental Protection Agency  
Cincinnati, Ohio 45268

## **Disclaimer**

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## **List of Abbreviations, Acronyms and Definitions**

CDC	Centers for Disease Control and Prevention
CBPC	Community-Based Participatory Communication
DNU	Do not use
EPA	United States Environmental Protection Agency
FDA	Food and Drug Administration
IRB	Institutional Review Board
MCMH	4-methylcyclohexane methanol
NPR	National Public Radio
PRA	Participatory Rural Appraisal
Promotoras	Lay community health workers or advocates, primarily in Latino/Latina communities

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## **Executive Summary**

The purpose of risk communication is to protect the health and safety of the public as well as the preservation of the environment by cultivating and maintaining an informed public.

This study, *Community Engagement and Case Analysis Methods for Developing Post-Incident Risk Communication Strategies for Intentional Biological Environmental Contamination Incidents*, comprised two phases:

Phase 1: five robust case study analyses of recent/significant contamination incidents that provided examples of real-world impediments experienced and successful strategies to effective risk communication employed before, during, and after crises

Phase 2: implementation of the Community-Based Participatory Communication (CBPC) methods, including the development of sample media messages, to elicit community feedback to inform post-incident risk communication strategies

This report focuses on the research conducted in Phase 2.

Phase 2 messages were grounded in knowledge that had been derived from the analyses of actual events and in the lived experiences of community members engaged through the study.

This grounding increased the credibility of the scenarios created as part of the study. Specific

Phase 2 activities included:

- In-depth interviewing of community opinion leaders, emergency responders, state and federal agency personnel, and journalists
- Developing and testing of communication strategies and messages for a hypothetical intentional biological contamination case scenario

- Forming and working with listening groups of specific stakeholders that would provide key data regarding the perceptions and preferences of specific population segments

In addition to results of Phase 2 research activities, this report includes recommendations for post-incident decontamination and clearance communication that have been informed by findings. The recommendations include: the existence of clear response plans; involvement members of the media; culturally sensitive messages; and continued communication throughout recovery efforts. Strategies suggest a means for public health officials and emergency responders to communicate with stakeholders, the media, and the myriad publics they serve to support an understanding of post-contamination activities.

## **Introduction**

This study, *Community Engagement and Case Analysis Methods for Developing Post-Incident Risk Communication Strategies for an Intentional Biological Environmental Contamination*, was funded through the U.S. Environmental Protection Agency (EPA) assistance agreement number 83498801. The goal of the study was to develop a set of expanded or modified risk communication strategies for post-incident decontamination and clearance activities associated with an intentional biological environmental contamination. To generate the strategies, two complementary methods were implemented in successive phases. The first phase included robust case study analyses of five recent, significant contamination incidents through the investigation of agency reports, media coverage, and interviews with key case-specific informants. As surrogates for intentional contamination events, the cases selected were analyzed to derive lessons learned that could inform: (1) the communication strategy and message testing that was incorporated in the second phase of the study and (2) the adaptation of existing or the development of new risk communication advice. To provide convergence across agencies with similar goals, the best practices in risk communication adopted by EPA (Covello and Allen, 1988) and those developed by the Department of Homeland Security's National Center for Food Protection and Defense (Seeger, 2006; Sellnow and Vidoloff, 2009) were referenced in the case analyses to determine to what extent communication strategies followed best practices on a case-by-case basis.

The second phase of the project began in the spring of 2013 and focused on the ways in which disparate stakeholder groups differentially perceive risk and subsequent risk communication. The project sought to identify the values, knowledge, beliefs, information, and media preferences for designated population segments in a metropolitan area. This report

describes the study in detail, including the underlying theory and recommended methodology, research activities, data collection procedures, findings, subsequent implications and study limitations.

Phase 2 incorporated Community-Based Participatory Communication (CBPC) methodologies, a set of applied practices derived from the recognition that the knowledge and perspectives of community members is valuable and that including community members in research increases the validity of the study. In order to both engage and query the community, CBPC methodologies for this study included in-depth interviews with emergency responders, state and federal agency personnel, environmental and health interest community members, and other civic leaders. The research team drafted six scripted, targeted scenarios based on the lessons learned from the case analyses and on the understanding of risk communication needs derived from the interviews referenced above. These scenarios were converted to audio recordings. Once developed, these radio news clips were again shared with community members in order to generate comments and offer an opportunity for revision as needed. Stakeholder-specific listening groups, drawn from various segments of the local population, listened to a set of three recordings and were asked to provide feedback about these carefully crafted fictitious news reports, examining both content and communication preferences. Over the course of the Phase 2 data collection period (when listening groups were being conducted), there was an actual spill in West Virginia that contaminated water sources (Bruggers, 2014). This both served to increase the salience of the sample messages developed as part of this study and influenced the questions, concerns, and responses of community members.

Participant responses, which (with their permission) were captured on digital recorders, were examined and coded using a thematic approach, leading to the results reported later in the

report. Subsequently, these findings, along with insights from Phase 1, informed the post-incident risk communication recommendations provided in the report.

## **Phase 1: A Brief Review**

Phase 1 included robust case study analyses of five environmental contamination incidents and examined key communication strategies and messages. Methods used a combination of agency reports, media coverage, and interviews with key informants as appropriate. Actual communicative actions were compared against established best practices, such as the Seven Cardinal Rules for Risk Communication (Covello and Allen, 1988), (See Appendix 1) and the Best Practices for Risk and Crisis Communication proposed by Seeger (2006) and as shown in Figure 1, modified by Sellnow and Vidoloff (2009). Analyses of these case studies yielded instances where Best Practices were successfully adopted, as well as circumstances where the communication efforts fell short of these recommended practices. The lessons learned from these case studies were valuable in the development of scenarios and discussion guides for the listening groups in Phase 2 and ultimately informed the final recommendations about adaptations to the aforementioned Best Practices. The purpose of risk communication is to protect the health and safety of the public as well as the preservation of the environment by cultivating and maintaining an informed public. It is generally accepted that rapid and clear communication increases the quality of understanding and actions needed during a crisis. Current risk communication practice denotes both a multi-party and an iterative process, not just a one-way dissemination of information.



**Figure 1. Best practices for risk communication (Sellnow and Vidoloff 2009).**

The five cases selected represented a wide variety of environmental and human crises. The lack of appropriate contingency plans, the adoption of plans suitable for one environment but not for others, the unwillingness of senior management to accept responsibility and/or to communicate uncertainty, and the lack of understanding about the importance of cultural differences were all evident in one or more of the cases. Other findings in the study supported the need for an additional practice - *communicate recovery efforts*. Individuals often need information about alternative actions and health risks once the initial crisis passes and recovery strategies are employed. This best practice should include communicating corrective actions taken and strategies employed to improve community engagement.

## **Phase 2 Conceptual Framework: Community Engagement through Community-Based Participatory Communication (CBPC)**

The engagement of the community and their service providers in research and planning of risk communication programs is increasingly being recognized as an essential process for identifying and addressing issues that are important to both the community and researchers (Covello and Sandman, 2001; Heath, 2006). Several policymakers and funding agencies have realized that community engagement not only helps the community to better understand their problems but also enables researchers to understand and address both community priorities and the need for culturally sensitive programs to address these priorities (Rosenstock et al., 2003; Ahmed and Palermo, 2010).

The first two of the Seven Cardinal Rules of Risk Communication (Covello and Sandman, 2001) recognize the need to engage the community. Rule 1 is to “Accept and involve the public as a legitimate partner.” It goes on to say that “... people and communities have a right to participate in decisions that affect their lives, their property, and the things they value.” This rule urges risk and crisis communication researchers and planners to:

- “Demonstrate respect for the public by involving the community early, before important decisions are made.”
- “Clarify that decisions about risks will be based not only on the magnitude of the risk but also on factors of concern to the public.”
- “Involve all parties that have an interest or a stake in the particular risk in question.”
- “Adhere to highest moral and ethical standards.”
- “Recognize that people hold you accountable.”

Rule 2 is to not to make assumptions about what people know, think or want done about risks. This rule urges risk and crisis communication researchers and planners to listen to the audience and recommends the use of techniques such as interviews, listening sessions, advisory groups, and surveys a) to ensure that “... all parties that have an interest or a stake in the issue be heard” and b) to understand “... the “hidden agendas,” symbolic meanings, and broader social, cultural, economic or political considerations that often underlie and complicate the task of risk communication.”

In the same vein, several respected scholars in the 2006 special issue on *Best Practices in Risk and Crisis Communication (Journal of Applied Communication Research)* also noted the need for risk researchers and planners to take a multi-disciplinary approach and consider the various stakeholders that might be affected (Heath, 2006). According to Reynolds, (2006), contemporary crises are complex in nature and organizations cannot always tackle these problems alone, but must engage key stakeholders and members of the public prior to an actual crisis. Thus, as evidenced by both research and practice, it has become clear that organizations must understand the perceptions, concerns and apprehensions of the communities they serve and frame their communication accordingly (Seeger, 2006). According to Sellnow and Vidoloff (2009), the communities’ perceptions reflect their reality, which could be factually correct or incorrect. Understanding and acknowledging public concerns and perceptions help build the credibility and trustworthiness of the organization, which is important during a crisis (Reynolds, 2006).

The second phase of this project focused on discovering the ways in which disparate stakeholder groups differentially perceive risk and subsequent risk communication by identifying

the values, knowledge, beliefs, information, and channel preferences for designated population segments in selected metropolitan areas.

The community engagement model for this phase of the project was informed by the principles and techniques of Community-Based Participatory Communication (CBPC), including in-depth interviews with local opinion leaders, emergency responders, state and federal agency personnel, environmental and health interest community members, and other community leaders. Stakeholder-specific listening sessions were used to identify values, knowledge, beliefs, information, and channel preferences for each designated population segment and to assess communication strategies and messages presented in contexts culled from the case study analyses completed in Phase One of this project.

Community-Based Participatory Communication (CBPC) has developed within the broader context of Participatory Communication, Participatory Rural Communication Appraisal, and other participatory approaches (Beltrán, 1993). Participatory processes view communication NOT as an instrument of transmission or persuasion but instead as a dialogic process for exchanging views and involving community members in discussing issues that affect their lives. CBPC uses both traditional and modern forms of communication and organization to protect tradition and cultural values, while facilitating the integration of new elements. It creates an environment that empowers individuals and groups, giving them the freedom to voice their perceptions of reality and to act on these realities (Dagron, 2001; Carey, 1989).

CBPC is not simply a community outreach strategy and it not necessarily focused on widespread generalizability and diffusion (Dagron, 2001). Rather, it emphasizes the building of trust and rapport among all parties, along with the empowerment of individuals and communities, toward truly collaborative decision-making processes to achieve outcomes that

resonate with community values, culture and perspectives about the future. CBPC thus favors decentralization and democracy; people involvement and dialogue; and interpretive, horizontal, and bottom-up perspectives. It posits an alternative and complementary conceptualization of communication that does not model the process as a linear, one-way, top-down transmission of information and persuasive messages (Anyaegbunam et al., 1999; Wallerstein and Duran, 2006).

CBPC, research is a collaborative partnership that strives to equitably involve in every aspect of the process all potentially affected parties, including community members, organizational representatives, and researchers (Israel et al., 2001). Done properly, such research builds bridges between community participants and government agencies, allowing all parties to gain knowledge and experience. All partners contribute their expertise and share ownership of research findings and decisions for action. This collaboration assists in developing culturally appropriate decisions and policies, thus making projects more effective and efficient. Finally, participatory methods can establish a level of trust that enhances both the quantity and the quality of information generated (Anyaegbunam and Kamlongera, 2002; Viswanathan et al., 2004; Cornwall and Jewkes, 1995; Wallerstein, 2000; Fisher and Ball, 2005).

Using discussion triggers (such as picture or audio codes, interviews, and group-work), CBPC facilitates dialogue among community members and between them and researchers. This dialogue enables all parties to reach mutual understandings and to create action plans that are acceptable to the community (Anyaegbunam et al., 2004). In CBPC, communication is a two-way process in which all people are seen as important sources of information with ideas worthy of being heard. Passiveness, therefore, is theoretically non-existent in this process because it requires active mental cooperation of all the people involved until a common awareness and understanding is reached (Rogers and Kincaid, 1981). It is a process in which all participants

decide on a course of action together. This view of communication presupposes the equality of all actors. The convergence model of communication developed by Rogers and Kincaid (1981) best captures this framework.

The roots of CBPC can be traced to the work of Lewin (1946), who used the term “action research” to describe an approach that stressed cycles of action and reflection involving both researchers and research participants. After several permutations, Lewin’s work found expression in various participatory methods that started to emerge in the 1970s, especially in developing countries (Beltrán, 1993). During this period, many researchers became increasingly disillusioned with the lack of progress in rural areas. The limitations of traditional communication methods were becoming apparent. The assumption that lack of education was the primary impediment gave way to the realization that the wealth of collective indigenous knowledge among rural people could effectively help raise living standards. Researchers also realized that when rural people are involved in the identification of their own problems and needs, they are more likely to support the necessary actions to address their situations (Anyaeibunam et al., 2004).

As such recognition emerged, researchers began abandoning questionnaire methods, which tended to be too long to administer, very rigid in their formats, and lacking in recognition of local realities (as the instruments were usually designed by researchers sitting in urban offices). Seeking more effective methods of data gathering, researchers realized that most illiterate or semi-literate people could communicate effectively about any issues that impact them with the help of visual representations.

All of these factors gave birth to Rapid Rural Appraisal, which relies on the importance of situational local knowledge rather than statistical findings from questionnaire methods. Data

are gathered quickly, and reports prepared in the field. Rapid Rural Appraisal is primarily an extractive approach in which outsiders control the research process, going into rural areas, obtaining information from rural people, and taking that information away for processing and analysis (Brown et al., 2002).

As Rapid Rural Appraisal was applied in more situations, it became clear that communities needed to be involved not only in data collection but also in the prioritization and analysis of their problems and needs. Out of this process emerged Participatory Rural Appraisal (PRA) and later Participatory Learning and Action. These techniques involve empowerment, respect, and inclusiveness of local people in decision making processes. Researchers determined the only way to learn needs was by listening to the local people. Similarly, local people lacked some of the technical knowledge necessary to solve problems. Thus, knowledge *sharing* became an essential component of PRA. This methodology has been further developed in the communication field and is known as Community-Based Participatory Communication (CBPC).

## **Methodology and Process Model: Community Engagement through Community-Based Participatory Communication (CBPC)**

### *Research Procedures:*

Phase 2 of this project promoted a multi-stakeholder partnership approach to risk communication through the implementation of CBPC. In this phase of the project, several participatory techniques were used to discover the ways in which disparate stakeholder groups differentially perceive risk and subsequent risk communication efforts related to rebuilding trust and stakeholder confidence following an intentional biological contamination incident. Methods used include in-depth interviews with local opinion leaders, emergency responders, state and federal agency personnel, environmental and health interest community members, and other community leaders. Stakeholder-specific listening sessions were used to identify values, knowledge, beliefs, information, and channel preferences for each designated population segment and to assess communication strategies and messages presented in contexts culled from the case study analyses. Elements from the risk communication Best Practices (see Figure 1), lessons learned from the robust case analyses completed during Phase 1 of the project, and information from other contamination incidents informed the development of the various protocols for this second phase of the project.

Phase 2 was conducted in various counties in Kentucky. Research began with in-depth interviews or small group meetings with community opinion leaders, water supply systems experts, emergency responders, state and federal agency personnel, and journalists. Interview questions focused on the identification of the following:

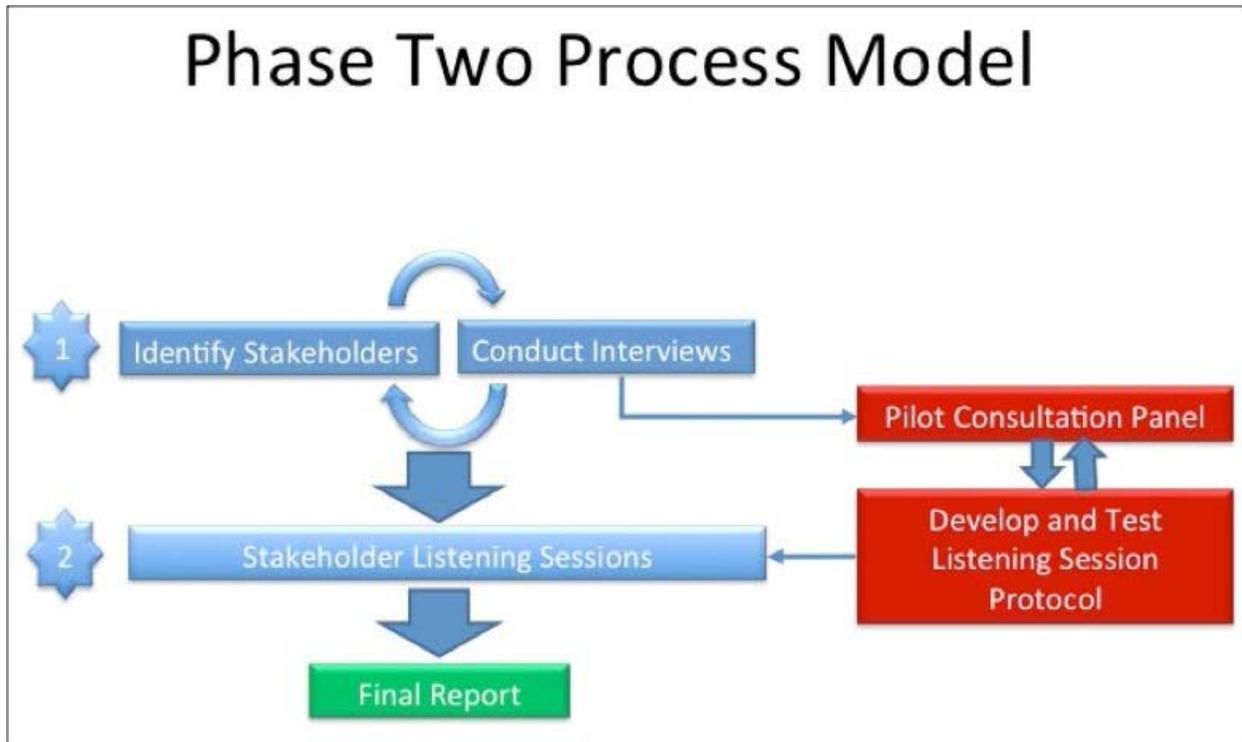
1. Concerns about potential post-incident communication challenges following a biological contamination;

2. Opportunities to improve message strategies before and/or communication processes during an intentional biological contamination;
3. Challenges related to rebuilding trust and stakeholder confidence following a contamination incident;
4. Information gaps related to water security, potential exposure pathways, health effects of biological contaminants, and other technical and/or policy issues; and
5. Identification of additional stakeholders who should be involved in the process.

As new stakeholders were identified, they were interviewed using the same interview guide. This process continued until the research team determined a saturation point had been reached and no new stakeholder categories emerged (Lindlof and Taylor, 1995).

Upon completion of the interview phase, the research team analyzed the data collected to identify and categorize distinct stakeholder groups. Emergent stakeholder groups included residents of various geographic sub-regions segmented by socio-economic status, including age, ethnicity and gender. Stakeholder segments identified also include local government officials, healthcare providers, school officials, the religious community, and others.

A pilot consultation panel was formed after the interviews. Every effort was made to select panelists from each of the stakeholder groups identified above. The panel was a very important part of the project. Panelists were responsible for recruiting study participants from their respective constituencies. They also advised on cultural appropriateness of proposed research protocols and reviewed all data collection methods, including the news stories used as discussion triggers during the listening sessions.



**Figure 2. Phase 2 process model.**

*Scenario and Protocol Development for Listening Sessions*

Following the establishment of the project Pilot Consultation Panel, the research team developed a listening session protocol to be implemented separately for each distinct stakeholder group and/or merged clusters in which independent stakeholder groups have been identified as having similar concerns, experiences, and knowledge bases. The protocol, based on a hypothetical intentional biological drinking water contamination case, and six versions of a news story announcing an end to the crisis and the lifting of a Do-Not-Use (DNU) order were developed. The six stories or scenarios were developed to trigger conversations about issues related to the lifting of the DNU order.

The main scenario of the intentional biological drinking water contamination case (hereafter referred to as the case) was an announcement that,

“... nine days have passed since suspect Jeremy Osbourne intentionally introduced deadly spores into the water supply that serves the southeastern quarter of the city. Since that day, more than 12,000 residential customers, dozens of businesses, two elementary schools and the community hospital were severely impacted by the DNU order designed to help reduce the number of contamination-related illnesses. But after more than a week of cleanup and testing, City Hall and the Water Utility District issued a joint statement this afternoon saying that, finally, our drinking water is back to national safety standards and residents and businesses can now use their taps again” (See Figure 3, page 19 and Appendix 2).

The research team chose to disseminate information about the lifting of the DNU order in the format of a news report. Whether a person connects with news through television, Internet or radio, the information probably has the same variables: a source authority (writer, anchor, etc.), other agents (field reporters, sources) and community respondents. While it is possible to route some of the most important information to specific channels, there is no guarantee how it may ultimately be received by the general public. Based on past experience, media producers, personalities and local agendas can positively or negatively impact audience trust, especially influencing how messages are framed, the depth of the story, the frequency with which it airs, and the degree to which the story is updated to ensure accuracy is maintained.

The news reports created in Phase 2 were created with three purposes in mind:

- 1) to serve as discussion triggers for listening sessions in order to determine how reports might be received, trusted and passed along to others
- 2) to determine what information is important to them

- 3) to discover what sources/channels of information community residents might seek to verify and confirm the safety of the water after hearing the initial news report about lifting the DNU order

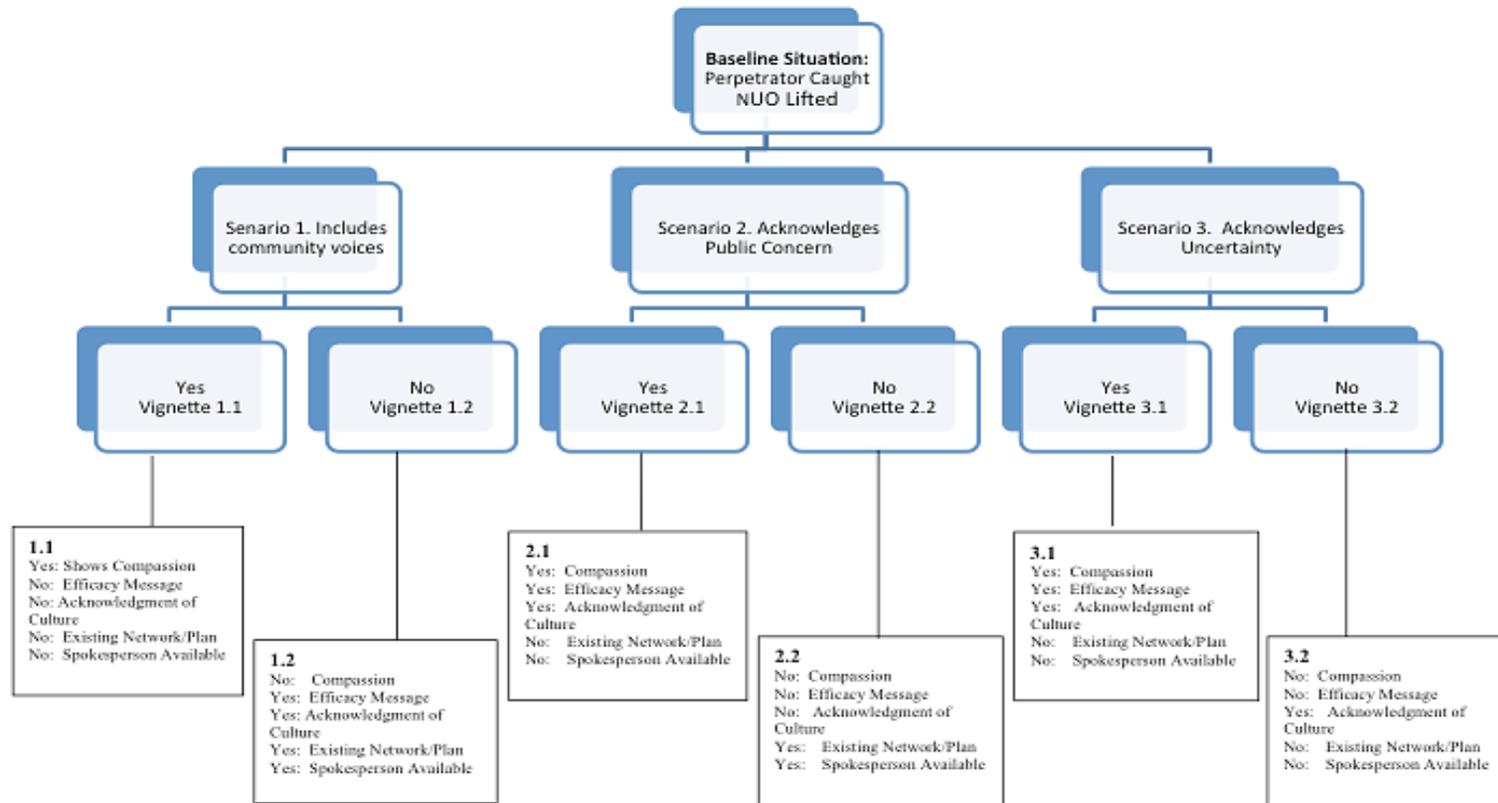
### *Script Design*

The research team first examined local and national news coverage of previous water contamination stories around the country. This included local reporting of an incident in Portland, Oregon where an *Escherichia coli* (*E. coli*) contamination of the water supply surpassed the safety standards of drinking water, and the authorities issued a restricted use order (KGW, 2012). The report began with an anchorperson in the newsroom describing the situation, then cut to a field reporter onsite at the point of contamination – a reservoir that supplied the city water. The field reporter shared information received from local governing authorities and water company representatives, as well as commentary on further actions (draining the reservoir) that *might* take place if the current cleanup strategy did not succeed. The discussion of possible future actions was somewhat problematic because it was speculative.

A second incident that provided the research team with guidance was a ground water contamination case in Pennsylvania, which occurred as a result of fracking practices to extract natural gas. CBS provided coverage of the situation, targeting a national audience (CBS, 2012). The producer began the segment from the New York studio; a recognized and trusted network voice provided an overview of the incident. The reporters then provided onsite interviews with some of the local residents, describing their experiences, thoughts and feelings. These stories included a local resident holding a glass of murky, discolored water taken from the kitchen tap shortly after a report by county officials indicated there were no harmful elements in the groundwater. The story also included information from officials who were available for interviews and references to those who were not available for live comment.

Using a scenario in which an intentional biological contaminant was introduced into the local water supply, the research team scripted a news story that explained that the water had been decontaminated and the DNU order had been lifted. Each scenario added or deleted key factors that might affect how the audience might receive the message. (See Figure 3, below, and Appendix 4). What effect would each factor have on the reliability and perceived validity of the message? Which elements would increase or diminish the trust of the community? Where might those in the listening groups go to confirm the report or find additional information?

SCENARIOS DECISION TREE: INTENTIONAL BIOLOGICAL CONTAMINATION OF DRINKING WATER SOURCE – POST EVENT



4/13/2014

Figure 3. Decision tree.

## *The Recordings*

Journalism experts on the research team interviewed water specialists and scientists familiar with real and potential dangers of intentional water contamination. To ensure the scenario of a biological agent, in this case a deadly spore, and its infusion into the water supply was both realistic and general enough to present to the public, the team consulted water company representatives, academic experts studying water systems, and U.S. EPA representatives. As a result of this formative work, the team wrote six news reports incorporating various Decision Tree (Figure 3) variables. Each script went through a vetting process that included no less than four reviewers examining it for realism, inclusion of the pre-selected Decision Tree variables, and consistency with recommendations from water specialists and scientists.

Voices for the characters in the news reports were recruited from the university faculty and student body. Each vignette was recorded on campus. Volunteers were given information about the overall purpose of the program and direction about how to present their dialogue in each vignette.

The College of Communications and Information at the University of Kentucky provided a professional recording studio for taping the anchorperson and portable digital recorders for the other characters (in order to include natural ambient noise reflective of the scene). In general, the flow of the news story was:

- News anchor introduced the breaking news about the removal of the DNU order
- Field reporter interviews community leaders and members
- Field reporter fills in the gaps and interprets information when officials are unavailable for comment
- Return to the news anchor for summary

All of the recordings were then edited and saved in an MP3 format to be used on devices suitable for playback to the listening groups. The University also supplied devices for both playing the vignettes in the plenary and break out portions of the listening groups and for use in recording discussions as the group members interacted with the content. These recordings were then transcribed to determine the themes and implications of the scenarios on how actual community residents would respond and seek to verify what they heard on the broadcast.

The listening group protocol was designed to help the researchers identify the following (with probes where necessary):

- base-knowledge regarding potential contamination by a biological agent, as well as information gaps that new or ongoing community-based education efforts could address
- stakeholder group values
- relevant beliefs including
  - fears that should be addressed in messages
  - perceived self-efficacy in minimizing harm from the negative event
  - potential hazards and perceived risks related to intentional biological contamination
  - potential threats to message clarity and effectiveness, including widely-held misconceptions about the contaminant, exposure pathways, health effects, and remediation processes
  - additional concerns about biological security incidents or subsequent post-incident communication efforts
- expectations for the decontamination and clearance of a biological release including,
  - potential challenges for rebuilding post-incident trust and stakeholder confidence,

- community strengths and weaknesses for post-incident message dissemination,
- and opportunities for the community to build infrastructure that would promote the effective implementation of post-incident messages
- preferred message content and channels for specific stakeholder groups
- trusted information sources

The decision to collect this data is further explained in Table 1, below.

**Table 1. Scenario Variables Based in Theory and Practice**

Scenario Variables	Origins in Theory and Practice
<b>Community Voices</b>	<p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>● Listen to the audience</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>● Establish a crisis communication network with credible sources. These sources should also reflect the experiences and cultures of those in the community.</li> </ul>
<b>Acknowledges Public Concern</b>	<p><i>Best Practices</i></p> <ul style="list-style-type: none"> <li>● Understand the public's concern and understand the audience</li> </ul> <p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>● Accept and involve the public as a legitimate partner</li> <li>● Listen to the audience:</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>● Specific at-risk populations (e.g., children) may affect the requisite elements of the communication message response</li> <li>● Listen to the public's concerns</li> <li>● Understand the audience.</li> </ul>
<b>Acknowledges Uncertainty</b>	<p><i>Theory:</i> Uncertainty Reduction Theory - Uncertainty is unsettling and motivates people to communicate in order to reduce the tension (Berger and Calabrese, 1975).</p> <p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>● Be honest, frank, and open</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>● Accept uncertainty and ambiguity. In this case, help the public to adjust to a level of uncertainty while reducing it as much as possible.</li> </ul>
<b>Shows Compassion</b>	<p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>● Listen to the audience</li> <li>● Speak clearly and with compassion</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>● Communication with honesty, candor, and openness</li> <li>● Communicate with compassion, concern, and empathy</li> </ul>
<b>Efficacy Message</b>	<p><i>Theory:</i> Self-Efficacy and the Social Cognitive Theory (Bandura, 1977). We believe that we can succeed in certain situations, especially when we can take actions by taking cues from and observing others we know and trust.</p>

Scenario Variables	Origins in Theory and Practice
	<p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>• Speak clearly and with compassion.</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>• Provide messages of self-efficacy</li> <li>• Messages need to focus on how people can reduce their own harm</li> </ul>
<b>Acknowledgment of Culture</b>	<p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>• Accept and involve the public as a legitimate partner – this includes as many ethno-cultural expressions as is relevant to the region.</li> <li>• Listen to the audience – most minority cultural groups in a community feel a degree of marginalization from the mainstream, and lack of voice.</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>• Listen to the public’s concerns and understand the audience</li> <li>• Acknowledge and incorporate cultural differences</li> <li>• Recognize words and idioms chosen need to show cultural understanding and sensitivity.</li> </ul>
<b>Existing Network/Plan</b>	<p><i>7 Cardinal Rules:</i></p> <ul style="list-style-type: none"> <li>• Coordinate and collaborate with other credible sources</li> <li>• Plan carefully and evaluate performance</li> </ul> <p><i>Phase 1 Findings:</i></p> <ul style="list-style-type: none"> <li>• Establish a crisis communication network with credible sources</li> </ul>

Bandura, A. (1977) Social Learning Theory. New York: General Learning Press.  
 Berger, C. R., and Calabrese, R. J. (1975). Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. *Human Communication Theory, 1*, 99-112.

The project consultation panel reviewed the protocol for clarity, cultural relevance, and/or specific community concerns about the process. The protocol was amended as necessary and approved by the University of Kentucky Institutional Review Board (IRB) before implementation.

Following project the pilot consultation panel approval, the research team coordinated a number of stakeholder-specific listening sessions. These panelists assisted in the recruitment of listening session participants from their specific constituencies using formal invitations, newsletters, mailing lists, and other stakeholder-appropriate methods.

### *Expert Study Populations*

#### Experts, Technical, Opinion Leaders Interviews and Meetings

Three meetings and one in-depth interview were held with a total of 14 technical experts on water distribution systems, water security, and risk communications from several governmental and non-governmental agencies and institutions. This included representatives from the EPA (Office of Research and Development, National Homeland Security Research Center), a public water company, a state environmental protection department, and an academic institution in the region.

These experts helped to identify the major components of the study protocol, including the possible public health consequences due to an intentional water contamination, biological agents to be used in the scenarios (including their properties and possible health effects) and prospective stakeholders for the listening sessions. The experts also explained the various operational response options including public notification strategies, for a water contamination incident. The options would need to be applicable in a DNU drinking water situation, where alternative sources of water **MUST** be used for all human activities.

#### *Pilot Consultation Panel Meetings*

One consultation panel meeting and two in-depth interviews were held; nine representatives, one woman and eight men, attended the consultation panel meeting. Composition of the panel included representatives from EPA, a regional university, a religious organization, a state environmental protection department, a water company, and a state department of transportation. A journalist and a communication specialist, both men, were also interviewed separately for the project.

The meeting and interviews helped the project pretest and revise the draft study protocol, post-incident scenarios and radio news vignettes for the listening sessions

### *Community Listening Sessions*

Approximately 72 participants (ages 18 and above, roughly half male and half female, with demographic characteristics mirroring that of the broader population of the counties selected to participate in the study) participated in the eight listening sessions. Although the samples used in this study were selected based on a convenience method, efforts were made to ensure that participants provided a broad spectrum that included women and minority groups to ensure that the data gathered reflect the disparate views of the community at large. The selected segments were:

- Promotoras (i.e., lay community health workers or advocates, primarily in the Latino/Latina communities) (Latina, Females)
- African Americans (Females)
- College Students (Males, Females, Millennials)
- Teachers (Males, Females, Various Ethnicities)
- Health Department Workers (Males, Females, Various Ethnicities)
- Medical Doctors (Males, Females, Various Ethnicities)
- Senior –aged Citizens (Males)
- African Refugees (Males, Females, Various Ethnicities)

### *Subject Recruitment Methods*

Contact with the disparate populations in the study counties was initiated through outreach to the contacts of stakeholder group members on the project pilot consultation panel and by word-of-mouth and via mailing lists maintained by those gatekeepers and/or their relevant

organizations. The research team did not have access to these mailing lists. Memos and emails outlining listening session process and goals, along with date, time, and location were distributed by specific pilot consultation panel members, as well as on church and workplace bulletin boards in the counties. The listening sessions took place at locations convenient to participants.

Listening session discussions were audio recorded and also discussions were also captured by note takers. During data analysis, names or other identifiers that could affect data confidentiality and/or participant privacy were deleted and replaced with pseudonyms.

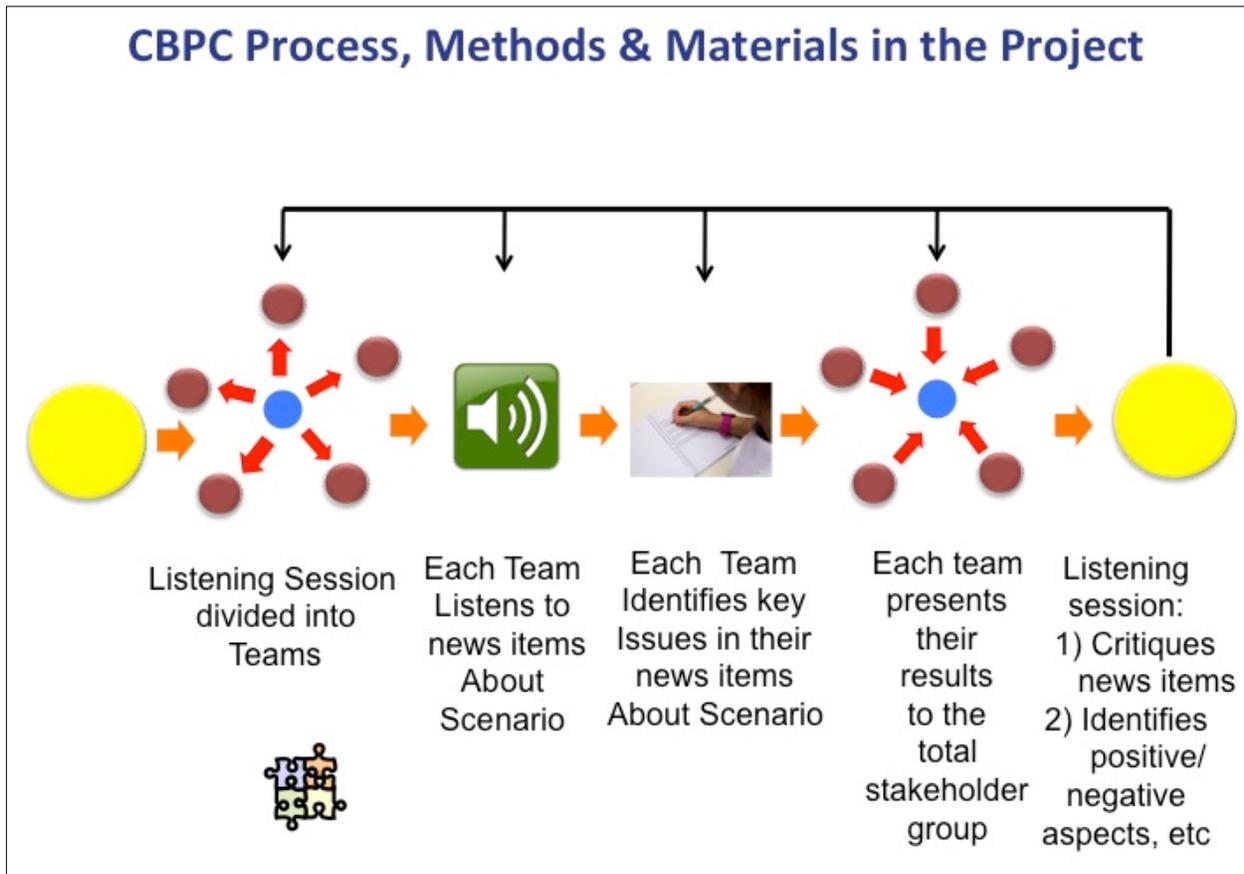
#### *Informed Consent Process*

To ensure that all segments of the study population freely participated in the project, the research team applied for and obtained a “waiver of written informed consent.” approved by the University of Kentucky IRB. The informed consent document was read orally to potential listening session participants by the investigators and questions were solicited from the group. Participants were provided with paper copies describing the informed consent for the project. Participants were advised that should they elect not to participate in the study after hearing the consent form contents, they could partake in refreshments and leave. Once everyone had refreshments, participants were asked to reconvene for the listening sessions. After being seated, participants were informed of restroom locations. Listening session discussions began only after attendees have had an opportunity to ask questions about informed consent and choose whether to participate.

#### *Listening Session Discussion Procedure*

After completing the consent process, the study team explained the purpose of the listening group and outlined the steps for the meeting. For each listening session, participants gathered for approximately 90 minutes to listen to the news clips and offer their feedback. The

need for participants' to share their honest responses to each clip was emphasized. The only listening cues given ahead of time were that each clip differed from all the others in a portion of the content, and that it would be important to know which was most or least helpful to them and why. Next, participants were divided into sub-groups to listen to two or more news clips, discuss what was successful or less than successful about the clips, and to share any other relevant comments. Facilitators recorded these discussions and took notes as the situation allowed. Finally, all participants reconvened to summarize their findings and offer suggestions on what elements or strategies were most helpful, least helpful or might be helpful in the future. The discussion in the plenary group was also recorded to ensure more precise analysis. After each presentation, the group as a whole was asked to discuss the specific clip, offering their understanding of the clip, their perceptions of the communication strategies and messages represented in the clips, and other related issues. After all news clips had been presented, the group was asked to imagine, discuss, and/or recommend other communication strategies or messages that have not been presented. Before departing, participants were given an opportunity to identify anything that the research team might have "missed" during the discussion (see Figure 4, below).



**Figure 4. Process model.**

#### *Data Analysis Strategies*

The data from the expert interviews/meetings and community listening sessions were analyzed using Richard Krueger’s Systematic Analysis Process (Krueger, 1994; Krueger and Casey, 2000). The first level of analysis actually started while the interviews/meetings or listening sessions were in progress. In addition to recording the session, the facilitators also took notes and listened to participants’ discussions for inconsistent, vague or cryptic comments and probed for understanding. At the end of each session, facilitators summarized key questions and answers and sought confirmation from participants.

Immediately after each study session, the facilitators checked the tape recordings to ensure proper operation and conducted a debriefing to identify themes, hunches, interpretations, and ideas, and then compared and contrasted the session with other sessions. Field notes, tapes and other materials were labeled and filed.

Subsequently, research staff analyzed individual the session by listening to tape and reviewing field notes. Report of each individual session was then prepared, with amplifying quotes. These reports were shared for verification with other researchers who were present at the session.

Later, after all of the sessions were completed, researchers met and compared and contrasted results of individual sessions. Researchers identified emerging themes for reporting the data and identified appropriate quotes to illustrate the findings. The listening group stage relied upon an iterative process. Throughout this stage, the research team met at regular intervals to discuss experiences in the field, identify emerging themes, and propose additional target stakeholder groups. At the conclusion of work in the field but prior to data analysis, the team met once more to discuss findings and propose an initial set of emerging themes to inform the initial coding stage. Transcripts and investigator field notes were placed into a baseline QSR NVivo® (QSR International Pty Ltd, Doncaster, Victoria, Australia) qualitative data analysis software file that was provided to each member of the research team for individual use.

Transcript and field note analysis began with study investigators conducting an independent, iterative coding process using the baseline NVivo file as a starting point and expanding upon themes as analysis required. During early analytic stages, study investigators engaged in individual provisional coding (Saldana, 2009) of each dataset, identifying first broad topic categories. During secondary coding, investigators linked data and preliminary findings

with the existing Best Practices for risk communication (see Figure 1). In third cycle coding, investigators examined emergent within-dataset patterns, grouping related codes into broader categories and examining potential implications both for the hypothetical contamination scenario and, more broadly, for existing Best Practices for risk communication.

## **Phase 2 Study Findings: Listening Groups**

In this section, we present the findings of the Phase 2 research, which engaged approximately 72 participants, ages 18 and above, in eight listening sessions. We present each listening group's reactions to the six news clips used to generate dialogue during the listening sessions. The results are arranged according to each group's greatest concerns, objections to the message, positive reactions to the message, preferred communicators, and preferred channels. The results presented below show the ways in which disparate stakeholder groups differentially identified base-knowledge, values, beliefs, expectations, information and channel preferences, and trusted information sources. A summary of findings by study variable is found in Table 2, pages 55-56.

### **1. African American Females**

(8 participants, ages 28-67)

#### *Greatest Concerns*

Participants in this session had a wide variety of concerns about the water contamination and the subsequent "return to normal use" message. Many of the concerns were of a practical nature. They were uncertain what it meant that the ban had been lifted and wondered exactly how the water could be used at that point. For instance, some of the messages suggested that consumers run the water for 5 minutes to flush out the pipes, but there was concern that such action would not really clean the pipes or their sinks. In addition, they asked whether running the water through the pipes would cause these waterborne contaminants to become airborne.

Another set of their concerns was health-related. They were concerned about the period of time between the initial contamination and when the DNU order was issued. There were questions about who might have been exposed during this period and what the immediate and

long term consequences of exposure might be. They also expressed uncertainty about where they could find answers to these questions.

In addition, they had economic concerns. Higher grocery bills as a result of buying bottled water and doctor/hospital visits as a result of potential exposure were two of the financial burdens mentioned. In addition, while they felt there should be a discount on their monthly water bill, they were concerned that what there would actually be an increase to cover the cost of all of the testing and treatment required as a result of the contamination.

Finally, they mentioned school closings as a result of the contamination as an additional burden for parents and children. This disruption might also cause the children fear for their safety. However, the group suggested apprehension would not be limited to children; some indicated it would also take time before they felt confident using the water again. Concerns about whether this could happen again and what could be done to safeguard against such an act were mentioned.

### *Objections to Messages*

Participants expressed several concerns about the content and presentation of the messages. First, they were not particularly interested in hearing about the perpetrator of the crime. They said that the emphasis should be on the impact on the community and not on Jeremy Osborne (the perpetrator).

Another set of concerns dealt with the role of elected officials and the water company in providing information. They felt that reports where the mayor declined to comment were less trustworthy. They suggested that the mayor and her children should be filmed drinking the water.

Some participants expressed that they felt the message did not have a serious tone and/or seemed like a TV drama. One woman stated that the reporter should recognize that the audience is intelligent and just needs information to manage their own health and safety. However, others felt that the message was already targeted at the better educated. A suggestion was made that the report should include clips about how the testing was done.

The biggest concern was that the message left the audience with a need for more information. Participants asked:

- All clear for whom? Babies? Elderly? Infirm?
- Exactly how was the water cleaned? What actions were taken and what assurance do I have that the water was actually cleaned?
- Would I need to do something to my pipes...run some kind of cleaner through them while I flushed them?
- Is it really enough to run the water for five minutes? You spent nine days cleaning it and five minutes will clean my pipes?
- Could I have my water tested after it comes out of my pipes?

#### *Positives about Messages*

Study participants did express some positive reactions to the news stories. They were reassured when they heard that the government and the water company seemed to have a plan of action in place, rather than creating one in the middle of the crisis. They were appreciative of the stories where Walter Jackson (the water company president) announced that there were community resources available to help and that community groups would be involved in the response. They also found it reassuring that some stories mentioned call-in lines, although they did anticipate that there would be bottlenecks in getting through.

### *Preferred Communicators*

Members of this listening group felt like it was important to hear directly from the mayor that the DNU order was lifted. They felt that while the joint statement was sufficient, they would have preferred to hear a live interview with her rather a pre-recorded reading of a written statement. This felt too impersonal. Messages that had no statement from the mayor were especially problematic as it was perceived as all secondhand information. One participant suggested that all key players should participate in a joint press conference and that they should organize town hall meetings that would allow for questions and answers. In addition, environmental experts and health professionals should be involved in crafting of message as they would address more technical issues and increase credibility.

The need for credibility and neutrality arose repeatedly in the discussion. Participants would have liked to have heard a message from the Centers for Disease Control and Prevention (CDC), as they felt they would be a more neutral party in these circumstances. They also mentioned that trust is important; hearing from individuals who both have an official role (e.g., government representatives, first responders, water company officials) and live in the impacted communities would be doubly credible.

Finally, they expressed concern that the government, media and civic organizations be mindful of the need to include messages that reach those who don't speak English, are deaf, or have low literacy levels.

### *Preferred Channels*

Suggestions for appropriate channels included social media, mass media and the use of the amber alert mechanism (as the electronic message boards on highways might be particularly

use for those just travelling through the area). Mass media should feature this as a breaking news alert and send out instant messages that ping on cellphones.

Members of the group indicated that social gatekeepers are as important as official sources in getting the word out. Facebook was mentioned as an important channel for those with access to technology. However, participants recognized that not everyone has access to technology and that care must be taken to reach these individuals, as well as to those just passing through the area.

Although circumstances resulted in closing of schools, those in this group who are teachers did not feel they would have any official role in getting the word out. They hypothesized that they would get text alerts from school administrators about how this would impact resumption of school calendar

Finally, for members of this community, church is an important hub. They suggested that officials should have face to face meetings with congregants at the church and should also interact with pastors about the situation on regular basis. Many pastors get the word out via social media and bulletins in between weekly church services.

## **2. College Students**

(7 millennials ages 19-22, 6 females and 1 male)

### *Greatest Concerns*

Participants in this listening session felt that, in general, messages in the tested scenarios did not create trust, confidence and credibility. Many aspects of the scenarios raised concerns for participants. The news reports that did not have authority figures speaking live about the incident were the most problematic. According to these participants, “we want an authority figure to speak.” “We would believe any authority figure without validating the source.” They

want the message from an authority figure (mayor and water department) not a broadcaster. Even for the news stories the participants liked, the absence of an authority figure, like the mayor, was a problem. Many participants were, however, reassured when the mayor and a water department official spoke on some of the news stories. This reassurance was tempered by the delivery style of the mayor. According to one of the participants, “It (the news story) had the mayor, which in theory is a positive but the mayor was not very effective in delivering a credible message.” “Confidence when delivering the message is important.” For these participants, “Enthusiasm over established credibility is important.”

Participants’ residual trust in the messages was completely eroded when one of the news stories cautioned that the water should not be given to babies and the elderly. As such, according to a participant, “I would buy water and wait until others used the water.” Participants unanimously agreed that the mayor should be shown drinking the water, when one of them asked, “Has anyone seen the mayor drinking the water?”

Participants were concerned that the news stories did not “Spell out the steps that were taken to clean the water” nor “Who actually conducted the water testing?” Also according to participants some of the technical terminologies in the stories, such as “national standards and containment” should be explained for the consumers.

Participants said the news stories did not clearly identify the affected parts of the city, which left them “...unsure where in the city things are safe and where they aren't.” Participants therefore felt that these “... messages could cause panic. Stockpiling bottled water would result ... there could be unrest in community as a result.”

### *Objections to Messages*

The college students who participated in this listening session felt that "...the messages did not grab our attention." For something this important, the group suggested that the message should be considerably shortened and preceded with an emergency alert signal and repeated several times so everyone hears it. To get these young people's attention, they advised, "...deliver at least the beginning of the message in monotone voice." "The woman announcer's voice would cause us to change channel."

As a news story, the participants "...want message from authority figure (mayor and water department spokesperson) not a broadcaster." They want the spokespeople to deliver the message with confidence and compassion and to "Get to the point immediately.... Seemed like a news article. If I wanted this much info I would get it online."

These participants did not like the scenarios that left out the mayor as well as specific steps about what to do. They were upset that water company representative and the mayor were unavailable for comment, according to the announcer.

The participants did not agree on two parts of the messages. While some of the college students saw the testimonial from a community member about watering his dog from the tap as important to develop trust, others believed that the "...testimonial was not very impactful ... we don't care about guy's dog." They pointed out that this portion of the story sought to put the "Emphasis on diversity but message was not key to me personally." "People our age are selfish and just want to know what impacts me," they explained. Also, some participants suggested that the news story should "Leave out the part about the perpetrator...could care less about him...want to know about water usage." Other college students however wanted "...to know more about perpetrator."

All participants in this listening session agreed that language of the messages was not very clear and accessible. “What are national standards?” “What was containment?” They would want to know more about “technical information including steps to follow,” “...the steps that were taken to clean the water” and “...where in the city things are safe and where they aren't.”

#### *Positives about Messages*

The messages that were most effective, according to the college students, include news stories that gave listeners tips on what to do. For example, the story that told listeners to flush their pipes before resuming water use was highly rated by this group. The group also liked news stories that provided phone numbers and web addresses for additional information in different languages.

Stories in which people in authority spoke live were also rated highly. The participants reported that they liked “...that the mayor and water department spokesperson talked about the collaboration with several agencies to solve the problem.” The participants also felt these messages were more compassionate.

#### *Preferred Communicators*

One of the college students summarized her information –seeking behavior this way, “I would talk to or text friends, check Twitter® feeds, check national and local news channels.” The participants would also prefer authority figures to deliver the messages, as long as they are articulate and compassionate and come from credible organizations like CDC. They also mentioned one of the most important sources of information would be their parents.

#### *Preferred Channels*

This group has access to both online and off line channels for getting their information. They claim they are bombarded with information from many angles and would need something

special to make them pay attention to the type of messages used for this study. Such a message, whether on TV or radio, must be short and "...to the point" and must signify that this is an emergency by using an emergency alert signal and streaming newscasts. Speed of access to information is very important to them.

Once their attention is caught, this group would use various channels to get more in-depth information. They would go online, check their social media networks and Twitter feeds and even tune into local and national TV stations. Some "Might listen to radio because of emergency circumstances but I don't usually listen to radio." "I would check social media (To listen to radio would have to go to car)." "What would help is to open the message with an emergency alert signal and deliver at least the beginning of the message in monotone voice."

### **3. Health Department**

(9 participants, 7 females and two males; one African American and 8 Caucasians)

#### *Greatest Concerns*

Health department personnel who participated in this study, in general, felt that although the news clips said it was "safe enough" to start using the water again, the clips did not inspire confidence that the water was truly safe and back to normal. According to one of them, "...the messages make us think we still need to be vigilant."

Listening session participants felt that many questions were left unanswered in many of the tested messages. For instance, the group would like the following clarified: "What was the contaminant?" "Did anyone die?" "What symptoms should the public look for?" "Where do folks go for help?"

They also wanted to know the specifics of what people can do with the water: "Although the Do Not Use order has been lifted, do you still boil?" "Is it only affecting drinking water?"

“Can you shower?” “Can you brush your teeth?” “Water your yard?” “How do we deal with water residue?”

To this group, since “Some people just don’t trust the government,” it’s critical to tell the public:

- “How it was determined that water was back up to national safety standards...who determined this?”
- “How was water supply brought back to National Standards ... how was this achieved?”
- “Why acceptable, who said it is acceptable?”

According to the group, clear answers to these important questions are critical because the DNU order would have adversely impacted the people emotionally and economically.

A warning that the water should not be used for a couple of days for the “...health compromised or infants and elderly,” which was featured in some of the news clips, was an indication that they should continue to monitor the situation for some in the group. The absence of the mayor and a water district spokesperson on some of the news stories, coupled with the warning about limited usage:

- “...makes you think they are unsure of the situation or that they don't agree with something.”
- “People would continue to be on edge because of fear of copycats.”

Some staff felt they would have to work long hours answering the phones even though they were not directly involved in the situation. Others felt like the calls would go to other agencies and not the health department. These differences in perceptions of responsibility among health department employees may have been attributable to the fact that they belonged to

different divisions. When asked who they would refer callers to for questions they could not answer, most participants responded “the water company.” However, conversations with water company representatives indicated they did not see this as a possibility, as they would only be involved in treating the water source and the trunk lines. Once the water entered the home, school, or other public space, it would be up to the owners or proprietors to deal with contaminated pipes, water heaters, health issues, and the like.

### *Objections to Messages*

According to the participants in this listening session, the tested clips were too long, most did not provide “...much advice” and some clips contained too much irrelevant information, such as the long conversation about the perpetrator. They prefer news stories that are “Pretty cut and dried about the water ban being lifted.” They also noted messages didn’t give any information on resumption of schools or the effected hospital

The clips, according to the participants, had “...too many different people talking - it became confusing.” They also indicated that the lack of contact information in some of the clips was disturbing.

The absence of the mayor and water company spokesperson in some of the clips “Makes it seem like mayor and the water company are not interested.... although this is not necessarily so... Also, the statement by the reporter that ‘No officials were available to comment’ makes you think they are unsure of the situation or that they don't agree with something.”

### *Positives about Messages*

The health department personnel, who participated in this listening session, felt “Good that they [news reports] stated the perpetrator had been captured.” They also said that “the presence of the agency / government officials is important for establishing trust - this shows

there is nothing to hide.” Even in clips where the reporter read the official statement, participants still felt that the “joint statement from mayor and water utility – gives more authority ...even though reporter reads.”

Participants liked the news reports that offered the public strategies to engage to ensure that the water is safe. They were impressed that the water department representative gave contact information; provided multilingual phone options, especially for non-English speakers; and provided a website for more information and instructions.

#### *Preferred Communicators*

According to these participants, “There is a system set up through funding from Homeland Security for the city that gives citizenry information.” The health department would likely have a single person or persons that would be designated to answer questions; others would forward calls to those numbers.

#### *Preferred Channels*

Several of these participants believe the Health Department could play a role in disseminating information about the situation. According to one staff member, “as members of the health department, we send out messages via our Twitter feeds and answer FAQs on the website.” In addition to existing emergency channels for communication, the health department would also likely use “announcement flyers, foot soldiers, mailings, texts from AT&T and schools” for disseminating information in this situation.

#### **4. New Immigrants**

(African Refugees - 4 females and 5 males, ages 18 - 30)

##### *Greatest Concerns*

Participants in this listening session first thought that the research study was related to the recent toxic spill in West Virginia that had a slight impact on the city where they live in Kentucky. A research team member explained that the study was not directly related to the toxic spill in West Virginia and the session continued.

The African refugee population had serious concerns about the research scenario. According to participants in this listening session, “Many refugees do not speak English.” “Many refugees might have ignored the Do Not Use Order because of their experience in Africa, where the water already comes from dirty sources and looks colored.” Unless you change the color of the water in the affected areas, they might still continue to use the water despite the DNU order.

After listening to the news stories, many participants insisted, “I won’t believe this until something else proves it.” To them, the news stories “Did not convince us about the water safety.” Later clips that warned against giving the water to infants and the elderly seemed to confirm this skepticism, “Elderly, young people should not drink the water yet. Why should we?”

This group had many questions about the incident:

- “Why did the contamination happen?”
- “What happened to the people who drank the water?”
- “Why didn’t someone in authority like the mayor, come out and talk about this?”

When they did hear from the mayor in subsequent clips, “... that made it more credible.”

The participants felt that “Turning on your water for five minutes before use is great information – but not enough. How do you really clean the water at your home?”

#### *Objections to Messages*

Participants felt that the clips contained “Too much information and language was a great concern.” They wanted “more information on what’s happening now and not about the criminal.” They felt the messages did not really give them enough information on how to flush the water sources at home.

#### *Positives about Messages*

Participants liked news stories that “gave us a web site and phone number, sources for additional information. They described this as “Very good. An improvement over the other news item. Contacts you can call.” They preferred news clips which featured the mayor and water utility staff, “The mayor spoke and that made it more credible.”

#### *Preferred Communicators*

Thinking about preferred communicators, participants said “We’ll call the doctor, watch the news.” In answer to the question, *what would make you trust that the water is now safe?* they replied “Website – not trustworthy; news – yes.” They advised the researchers to “Use face-to-face meetings in schools and churches and to go door to door.”

According to the participants,

- “The refugee population will be heavily affected. Many do not speak English. How do we reach them? Use local network, family. Refugees depend on their children for information.”
- “Our parents trust God and us. They’ll try to get in touch with pastor or pastor’s wife.”

### *Preferred Channels*

This group prefers Fox News<sup>SM</sup> (FOX News Network, LLC, Los Angeles, CA), school counselors, face to face meetings in schools, churches, door to door contact, Catholic Charities, and Kentucky Refugee Ministries.

## **5. Preventive Medicine Interns**

(9 participants, 5 females, 4 males, 6 Caucasians and 3 foreign nationals)

### *Greatest Concerns*

Unanswered questions may have posed the greatest concerns to this group of medical interns. Because of these unanswered questions, consumers may not be very reassured by the news reports. Unanswered questions centered on scientific and health concerns.

- What were the spores?
- How many people got sick?
- What were their symptoms? (although they did recognize this might plant psychosomatic ideas in people's minds)
- If the elderly can't drink it, how can you be sure it is safe for others?
- Why didn't they just shut the water off rather than issue a DNU order?

Another apprehension expressed in this group was about the danger of similar events occurring in the future and the need to plan for this possibility.

A final concern is how this would impact medical practices. Individuals may contact their family physician to get additional information; however, as one participant says "Being a doctor does not make me an expert on water." In addition, practices might become overloaded with patients with real or imagined symptoms that may or may not be related to the water contamination.

### *Objections to Messages*

The consensus was that this was not an effective initial report about lifting the DNU order. It might be okay for a follow-up story. Consistent with comments from other groups, it is important to feature the mayor, including a visual representation of her drinking the water. However, the monotonic voice of the mayor and the emphasis on thanking the response team made her message less than successful. Her statement was also perceived as equivocal, not definitive, which might introduce more concerns than it alleviates. One participant indicated that the tone of this story made it seem like this was occurring somewhere else....”not in my community.”

At least one intern indicated that the report should give more information about how the spores were eliminated from the water. Another intern pondered whether medical professionals might have different concerns and hear the message differently than the general public.

### *Positives about Messages*

These scenarios were perceived as reasonable, but providing more information would make them better. Instructions about specific behaviors (like running the water and pet safety) were good. Interns viewed as positive the information that the community had planned for such a crisis and that the mayor spoke to the community about the lifting of the DNU order (albeit via prepared statement).

### *Preferred Communicators*

This listening group had strong preferences for messengers that had health related credentials and backgrounds. Several participants indicated that messages (particularly the lifting of the DNU order) should come from medical or public health personnel, not politicians like the mayor. They also perceived that the health department would be extremely involved in

communicating about the health related issues (although this is not confirmed by listening groups with the health department). One participant commented, “How about a medical or public health person giving information? That would be better than a talking head like the mayor.”

However, there was also the recognition that there are people who do not trust the medical community, the government, or both, as well as people who are skeptical about science, particularly when it concerns invisible problems. While they recognized the level of trust may increase temporarily during a crisis (born out of necessity), one resident indicated that there needs to be representatives of “my community” providing information. This community could be defined by geographic, socio-political, ethnic, or other parameters with which one strongly identifies.

Recommendations were for clear, directive messages that did not introduce additional questions or concerns. Providing contact information was recognized as a good thing. They suggested that language level and complexity of details be appropriate for the audience. That said, one intern stated that “As a scientist, I want to know specifically the steps that were taken. That would reassure me.” Given that this may not be generally applicable, multiple messages may be required.

### *Preferred Channels*

Participants indicated that important channels include Facebook, news and public health websites, call-in lines, and broadcast stations (radio and TV). Websites are viewed as where people go when they hear something and want to know more. While the option to contact someone directly with questions is important, a concern is who will respond to the massive number of queries posed via the phone and websites, especially considering the multilingual options.

Several of these preventive medicine interns discussed how they would like to receive relevant medical information to share with their patients. One individual indicated an email from a high ranking public health or medical professional outlining exactly how doctors should interact with patients about exposure to the spores, including symptoms and what advice to give, would be extremely helpful. Another indicated that while much of this information might be available through the Kentucky Medical Association, not all physicians belong.

## **6. Promotoras**

(11 Latinas)

### *Greatest Concerns*

The greatest concern for this group was that many of them misunderstood the message. Some participants thought it was a general warning announcement about water contamination, advising parents about symptoms to watch for in their children. Participants indicated they understand the contamination was significant for their family, but encountered a language barrier trying to get information about what occurred or what action they should take. One person indicated that she knew there was a dangerous situation on-going, but not that it ended. Subsequently, she did not know what to do

Messages were presented a bit too fast and were confusing, mainly because of the language used in the message and interference caused by radio static. For instance, some participants confused the court date established for the perpetrator's arraignment as the date to start using the water again.

When asked, participants indicated they would rather wait for complete and accurate information than be given incomplete information sooner. They also mentioned that hearing these messages reminded them it's important to start developing an emergency crisis plan-

especially when there are children to educate. The language barrier also makes having a plan in place especially important.

### *Objections to Messages*

Participants indicated that they preferred to hear from someone in government, like the mayor, and were not happy with messages that did not feature an authority figure. When the scenario indicated that the mayor was not available for comments, participant viewed this as “fishy.” Although they wanted to hear from government officials, they felt the joint statement from the mayor and the water company executive did not inspire confidence, was not impactful, and served to introduce more anxiety. They also objected to the use of jargon like “national standards” without detailed explanation. Additional information needed included:

- Data to support the pronouncements that water is safe.
- Which water do we run for five minutes – hot or cold? Don’t understand ...
- A kit to test their own water.
- The symptoms to look for when children were getting sick.
- Will this happen again? What is being done to prevent it?
- What is happening to the water in other parts of the city?

Finally, they expressed a desire for clear information about what actions to take and indicated that such an important message should be broadcast in multiple languages.

### *Positives about Messages*

The messages they perceived as most important explained that this is about public health and safety related to the water system and that children were made sick as a result. Hearing from the mayor and an official from the water utility company about what they have been doing to clean the water was important. Messages where information was provided at a slower pace were

positively received. They also liked when the reporter gave a website and a phone number (and repeated the number) for more information.

### *Preferred Communicators*

Members of this group indicated it was important for the mayor (or another local government official) to speak to the people in this news item. Having said that, they did indicate they did not totally trust the government or the media because of past negative experiences. Other preferred communicators included the local health department, church leaders, the Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC) website (where they went for info on the 2009 novel influenza virus H1N1 and were satisfied). Others wanted to receive such announcements from their church and family. They recommended using existing networks in the community via email, Facebook and phone calls.

### *Preferred Channels*

These participants advised that in addition to radio (especially Catholic stations), multiple other sources should be used to disseminate the information, including television, social media (Facebook), phone calls to homes, newspapers, and bulletins or emails from the church and health department. They would also turn to family and friends to confirm what they had heard and to learn more about the situation.

The language barrier was mentioned multiple times. They suggested that television news broadcasts should include Spanish language subtitles since there is not Spanish language television in the area, “if just for emergencies like this”. There is a Spanish language radio station in the area that should be engaged in creating and disseminating messages for Spanish-speaking community members, particularly those most vulnerable because they have no

understanding of English. Even for those who do speak some English, it would be helpful if they simplified the language in the messages.

## **7. Secondary School Teachers (7 participants, 2 females and 5 males, all Caucasian)**

### *Greatest Concerns*

Members of this group indicated that, in general, the story communicated that the water restriction was lifted and that the community could return to normalcy, as the threat is gone and the water is safe again. However, on a personal level what did linger was the feeling that this could have been a devastating event for family and community. In addition, the fear of a copycat incident was mentioned.

On a professional level, the concern was about when schools could reopen. Schools can't function without water ... basic actions such as eating, drinking, flushing, and hand-washing would be curtailed. The group indicated to reopen would involve extensive preparation, the details of which would depend on the nature of the contaminant. At a minimum, in order to resume a normal school schedule the pipes would need to be flushed, bathrooms and cafeterias cleaned, and some items restocked, as it is likely they would have to dispose of mops, buckets, and the like.

Teachers indicated that school closure would impact extracurricular activities such as athletic schedules and club events. Students who count on free and reduced lunch school-based programs would be denied this important service. It is also possible that the school be used as a central meeting area during the crisis delaying school resumption. Even when schools did reopen, parents would likely wonder about their child/children's safety.

### *Objections to Messages*

One of the objections to the message was the focus on the crime committed that resulted in the DNU order. The suggestion was to stop talking about what happened to cause the problem and to focus on the lifting of the DNU order. The message should emphasize multiple times that it is okay to drink water now.

Questions arose about why the mayor would not speak to the reporter in some of the scenarios. Participants agreed that a “not available for comment” response was annoying as this was perceived to be a pretty important topic. In the stories where the news station broadcast a prerecorded statement from the mayor, one participant indicated that the statement was too long and not focused on what residents need to do at this point. In the messages where the statement from the mayor focused on thanking responders, a participant expressed that it felt too political and less about informing/instructing the public. Finally, the question arose about future water safety and official steps to insure this does not happen again.

When asked about the students’ potential responses, teachers indicated that they believe students are de-sensitized to messages such as these. Teachers say students would ask the question “what does this mean to me?” They perceive it likely that students would start drinking bottled water and never revert.

The expressed need for more information centered on issues of water testing and treatment. In addition to knowing more about the testing and treatment procedures conducted by the government and the water company, teachers believe both they and parents need to know what actions have been undertaken at the school to clean contaminated pipes and surfaces.

### *Positives about Messages*

This listening group found several positive aspects to the messages. That there was a plan in place to respond to circumstances like this was viewed as reassuring (although they felt the need for such readiness is troubling). Learning about the coordinated actions of the mayor and the water company was also mentioned as a positive, saying it might be reassuring to the public to learn that this is a multifaceted response effort.

One teacher responded that the report probably effectively covered the information that the news station was given. Whether the report is satisfactory will vary by listener. A participant indicated that for many this report is all they need to hear; however, others will question it, especially with the caveats about who should refrain from using it and the need for cleaning pipes in the home (which might introduce new fears). Hearing that the water was the same as before the contamination was reassuring for some.

Messages that provided more instruction than simple information were received positively. Additional message elements that participants liked from the different scenarios included: (1) the timeline; (2) comments from hospital officials; (3) action steps for consumers to take; and (4) multilingual hotlines.

### *Preferred Communicators*

While many participants said that hearing from the mayor (or someone in an official capacity) about the lifting of the DNU order is important, one participant indicated that since the mayor is not a water specialist, they would also want to hear from someone who is. The suggestion was made that perhaps the report should have been divided into several sub-reports, with subjects such as the perpetrator and subsequent legal actions, the joint team efforts and thanking of the responders, and the instructions to the public about the lifting of the DNU order

each treated separately. This may help resolve the criticism by one participant that this seemed like a human interest story and not focused on the information consumers needed to know. It might also address the criticisms that the message was convoluted and that it was boring when singularly-voiced.

### *Preferred Channels*

Reaching a large scope of the population using any one methodology may be a problem according to participants in this listening group. One teacher indicated that very few of their students watch or listen to the news. The perception was that people in their 20's and 30's rely on Twitter to get news bulletins, while older adults listen to the evening and late-night television newscasts.

## **8. Senior Aged Men**

(8 participants all Caucasian, all 65 years old and above)

### *Greatest Concerns*

This listening group viewed this news report as scary and would cause them to err on the side of safety. Jokingly, one participant indicated he wouldn't drink the water at all, but would limit himself to coffee! The news clip that indicated certain vulnerable segments of the population should still avoid using the water increased their skepticism about the safety of anyone using it. One participant indicated he would wait five days or more before he would use the water, even for his pets.

Concerns over the future were expressed. A participant asked how the public can be reassured this won't happen again. Finally, one participant expressed his concern that individuals might confuse the DNU order with boil water advisories that occur somewhere in town fairly frequently.

### *Objections to Messages*

Messages where no officials are involved were perceived as less reliable and sources of irritation. In addition, language needs to be chosen more carefully; using the word “hopefully” just raised more concerns, as did a reference to “National Standards”.

The need for more information was central to many of their objections:

- What about the lines in my homes, my pipes, the water heater, etc.?
- If I clear pipes for 5 minutes, what about water heaters ...20 minutes?
- I need more scientific explanations about how the water was treated.
- Trusting the news media, U.S. EPA and government about an ‘all clear’ is hard. I would like my own testing kit.

### *Positives about Messages*

The most positively received scenarios were those that provided the most instructions about what actions consumers should take. Appreciation was also expressed for information on who to call with concerns. Messages that reinforced that the government was prepared for crises and that agencies were cooperating were also found to be reassuring. The fact that they caught the perpetrator was also a positive development.

### *Preferred Communicators*

In addition to the mayor and water company officials, members of this listening group indicated that they trust local anchors and reporters to share the news about the DNU order being lifted “because I listen to them every day.” They also perceived emergency management officials as being trustworthy and having the facts

*Preferred Channels*

Preferred channels included newspaper, radio, television, Twitter, Facebook®, instant messaging on cellphones, weather radios, emergency warning systems, police cruiser speakers, and announcements at malls and theaters. While they suggested that all of these sources would be good, they did indicate that they did not all use each of these outlets. While one participant indicated he did not listen to the radio, another chimed in that this could be a good source if the power was out (using battery powered or car radios). Some felt that door hangers would be good for folks who might be out of town or otherwise not hear the all clear. There was concern for the homeless and other news stragglers. Finally, churches were mentioned as a news outlet for some. While the information may not be any greater than what is on the news, it might be a way to reach some people that would not be reached via other channels.

Table 2 describes the general findings for each of the six variables studied.

**Table 2. Summary of Findings by Variable**

Scenario Variables	Evidence in Findings
<b>Community Voices</b>	<p>While some of the participants saw the testimonial from a community member about watering his dog from the tap as important to develop trust, others believed that the "...testimonial was not very impactful ... we don't care about guy's dog." They pointed out that the portion of the story sought to put "Emphasis on diversity but message not key to me personally." "People our age are selfish and just want to know what impacts me," they explained.</p> <p>One participant indicated that the tone of this story made it seem like this was occurring somewhere else...."not in my community." And suggested that there needs to be representatives of "my community" providing information. Geographic, socio-political, ethnic, or other parameters with which one strongly identifies could define this community.</p>
<b>Acknowledges Public Concern</b>	<p>Across all listening sessions, participants in the study had a wide variety of concerns that were not addressed in the news reports. These range from the financial or economic ramifications of the crisis on families, unclear or incomplete messages/information in the reports, to concerns about the health of the community, despite the lifting of the DNU order. All these led participants in the study to feel that the messages did not create trust, confidence and credibility. Most participants, because of this, would not heed the call to resume water usage. They would rather continue to buy and use bottled water.</p>

<b>Acknowledges Uncertainty</b>	Since most of the tested messages did not fully address study participants' concerns, there was a lot of uncertainty and ambiguity. As a result, messages that were designed to alleviate ambiguity about who should not use the water yet triggered more distrust about the water safety for everyone. Many participants elected to continue buying and using bottled water until everyone in the community, including the elderly and children, could also use the tap water.
<b>Shows Compassion</b>	Participants in this study felt that the reports paid too much attention to the "criminal," who poisoned their water supply. They wanted more information on what's happening now, how best to safeguard their health and safety and not about the criminal. Also, the participants were not happy with the clips that did not have the authority figures speak directly to the community. To many participants, this was a sign that people in authority did not care very much about the wellbeing of the community. Participants felt that the messages that contained interviews with the mayor and water company spokesperson were more compassionate.
<b>Efficacy Message</b>	According to participants in this study, the most effective messages are the ones that "gave listeners tips on what to do." For example, stories that told listeners to flush their pipes before resuming water use were highly rated by all groups, although some participants still needed more specific information on how to accomplish this task or felt that five minutes would not be enough to flush out all the contaminants.
<b>Acknowledgment of the Culture</b>	Messages that acknowledged the diversity in the population by providing phone numbers to call for information in various languages were also highly rated by all listening sessions. Participants however pointed out that the message was in English only and that there would be bottlenecks in getting through. Many participants were not happy that the messages used language that would not be understood by many people in the community. According to these participants, the messages were targeted at the highly educated and used too many technical words. Participants advised that in a crisis, messages and channels should also reach those who don't speak English, are deaf, or have low literacy.

## **Discussion: Developing Post-Incident Risk Communication Strategies for Intentional Biological Environmental Contaminations**

This study has generated findings with implications for two primary sets of stakeholders involved in post-incident risk communication: (1) spokespersons, whether they represent utility districts or local, state, or federal government entities, and (2) members of the media who are charged with presenting vital information to publics throughout the life of a crisis. In two instances, the implications align closely for both spokespersons and media; in two other instances, findings point to opportunities for each group to independently build capacity for addressing the aftermath of crises with an ultimate goal of reducing the human, environmental, health, and financial costs of post-crisis decontamination and clearance.

In addition to providing information about how best to prepare for the decontamination and clearance phases of an intentional contamination event, findings from this study also have important implications for both the validity and implementation of the existing Best Practices for risk communication (see Figure 1, page 7). The research team generally found broad support for the best practices guidance document. Messages that emphasized prior planning, provided efficacy messages, and indicated spokesperson availability to the media tended to be received better than those that did not. However, responses to other best practices, such as including community voices, exhibited more variance across stakeholder groups. At times, stakeholders pushed back against some best practices, such as acknowledging uncertainty, indicating they want additional information before trusting the message. Importantly, each of these types of responses contribute to recommendations for implementation of specific best practices, as outlined below.

1. Both spokespersons and the media should distinguish clearly the differences between the current situation and other situations with which community members might be familiar.

Study findings support existing theories about the ways in which people make sense of crisis situations. As described by Blumer (1966) and Weick (1995, 2001), people interpret situations and jointly determine how to react based in part on the contexts in which they are communicating. By interacting with others, people form perceptions about levels of risk, evaluate their options for response, and decide how to respond to perceived risks based on their past experiences and shared understandings of a situation.

This sense making process became evident in this study when listening group participants described previous life events to help them make sense of the hypothetical contamination event. For instance, one school administrator repeatedly responded to recorded vignettes with variations on the phrase “when the hurricane came through Louisville,” referring to a September 2008 event in which the remnants of Hurricane Ike pummeled the city, causing four fatalities and extensive property damage (NOAA, 2013). In trying to determine how his school should respond following clean-up of the hypothetical water contamination, this administrator relied greatly upon what he had learned from living in Louisville during the aftermath of that event.

Similarly, several refugees indicated that they would have continued drinking water under a DNU order since their life experiences equated clear water with clean water. As a result, they recommended that water color be changed during a DNU period because water from a “dirty” source would look “dirty”, as it had in their prior places of residence. Thus, not only should past crises in the immediate geographic region be considered when communicating about a water emergency, but the past environmental health-related indicators acknowledged by

specific demographic segments now living within that geographic area should inform communications during the crisis itself and during the decontamination and clearance phase.

Community members sometimes base decisions on situations that they have not personally experienced but to which they have been exposed by the media. Semmler (2007) has asserted that media exposure encourages people to expand their “past experiences” to include information to which they have been exposed through television, radio, newspapers, and other sources, thereby changing personal beliefs about what is and is not normal. The research team first encountered this phenomenon when speaking with water utility leadership and staff, who repeatedly referenced a contamination event in Pittsburgh, PA, as a model for predicting both their own and other entities’ responses during a hypothetical contamination. Similarly, members of a local health department’s staff framed their responses to vignettes in the context of public health’s response to the 2009 H1N1 flu pandemic. Thus, the tendency to base interpretations of a current crisis response upon both media coverage and past experiences not only affects the perceptions of the public receiving post-crisis messages, but also of the responders charged with crafting those messages.

The tendency to mesh media coverage and personal experience impacted listening groups during the final stages of the study when a water-related crisis occurred in Charleston, West Virginia. Freedom Industries accidentally released a chemical (4-methylcyclohexane methanol) known as “Crude MCHM” into the Elk River, with the contaminated plume subsequently moving down the Ohio River past Northern Kentucky and Louisville, both of which were within the sampling frame for this study. During a listening group with new immigrants in one of these communities, the research team had to spend several minutes at the beginning of the session assuring participants that the hypothetical scenario was completely unrelated to the West

Virginia contamination and that, in fact, the study had been underway for more than a year prior to that incident. Still, members of this listening group continued to refer to the West Virginia case in subsequent comments.

These sense-making processes pose a distinct challenge for those charged with communicating with the public about decontamination and clearance. The tendency of individuals and groups to interpret events through lenses colored by past or ongoing events can lead to the creation of “self-fulfilling prophecies” (Weick, 1988), especially when community members limit their range of responses to the current event because of prior experiences with or media coverage of unrelated events. For example, news reports questioning the validity of water quality tests following the West Virginia contamination could encourage people in other regions not to trust the results of water quality tests in their own communities. This could also extend to a lack of trust in the organizations and individuals charged with communicating about the decontamination, subsequently resulting in community unwillingness to resume water usage even when water quality levels have equaled or surpassed pre-contamination stages.

For these reasons, it is essential that spokespersons and the media be prepared to highlight the differences between the current event and other events with which community members may already be familiar. Organizational spokespersons should be prepared to answer media questions about exactly how both the inciting event and its subsequent clean-up differ from other high-profile crises. Members of the media should be prepared to explain these differences to their audiences to help ensure that individual and community decisions are based upon the specific circumstances of the case rather than erroneous assumptions based upon other events perceived to be similar.

2. Spokespersons should be clear not only that the prescribed steps can be easily performed by target audiences, but also that these steps will have the desired effect in reducing risk. Thus, messages should address both self-efficacy and response-efficacy.

Most existing best practices for risk communication stress the importance of providing self-efficacy messages (See Figure 1 and Appendix (1) that is, assuring target audiences that they have the ability to accomplish the tasks being described (Bandura, 1977). As Seeger (2006) notes, crisis-related self-efficacy messages can have several components, including (1) recommending an action that can reduce harm, (2) providing multiple possible actions from which to choose, and (3) providing opportunities for affected individuals to act in a visible manner, even in cases where the recommended actions themselves do not actually reduce harm. However, for effective post-incident messages, this study indicates that communicating response-efficacy, i.e., that the recommended actions have been and will be truly effective in reducing risk (Witte, 1992), is as important as communicating self-efficacy. A recent study concluded that hospital worker uptake of the H1N1 vaccine was partially informed by beliefs about the effectiveness of the vaccine itself; this is one instance that underscores the importance of addressing both self- and response-efficacy in health-related messaging (Virsedá et al., 2010).

In virtually every listening session involving lay population segments, questions were raised regarding the trustworthiness of the water decontamination and testing processes described in the news reports. With college students, for example, these questions took the form of requests for “spell[ing] out the steps that were taken to clean the water,” as well as a desire to know “who actually conducted the water testing?” The latter question was echoed by local health department staff members, who delved even deeper, wanting to know “why [is the water]

acceptable,” in addition to who made the determination of acceptability. Most groups asked for more information about “national water standards.”

Across several focus groups, participants wanted definitive proof that the decontamination had been successful. In many cases, this proof took the form of a visible action by a high-profile figure. From college students to African-American women, there were calls for the mayor to “drink the water publicly” thereby provide concrete evidence that she believed the decontamination and clearance had been fully effective. Such calls affirm the utility of Kingston (TN) Mayor Troy Beets drinking tap water at a press conference following the TVA coal ash spill.

The lack of a clear response efficacy component in the news reports regarding resumption of water usage led to additional questions. While many of the radio vignettes provided a self-efficacy message to listeners, instructing them to run the water at their taps for five minutes to flush the pipes before resuming use, the lack of explanation regarding the reasons for engaging in such a strategy raised doubts for participants in multiple listening sessions. Rather than believing that running water would reduce risk to pre-event levels, new immigrants, for example, raised questions like “how do you *really* clean your water at home?” Similarly, African-American women wanted to know how to clean their sinks and flush their water heaters, based on the rationale that if contaminants in the pipes need flushing, some sort of additional cleaning of everything touched by the contaminated water also should be necessary. In addition, some groups raised related concern about the potential for taking recommended action to increase risk, as when African-American women questioned whether contaminants might become airborne during the sink-flushing activity. Such reactions underscore the need for

messages that not only explain *what* to do but also *why* doing it will reduce, rather than increase, individual risk.

3. Organizational spokespersons should be trained to better segment audiences for optimal message crafting and channel selection, as well as to identify credible sources for communicating with these audience segments.

While audience segmentation and appropriate message targeting have long been understood as pivotal for effective health communication (Slater, 1996) and can be vital for addressing disparities in information access across disparate populations (Newton et al., 2013), this study indicates that they are particularly important tools for designing post-crisis communication strategies. The centrality of appropriate segmentation is evident even when there first appears to be convergence regarding preferred delivery channels, credible sources, and message content. Each listening session included some discussion of such traditional media outlets as television and newspapers, for example, but the range of usage for each varied. Several groups specifically remarked that radio might not be the most effective way of sharing crisis-related information. Promotoras, however, noted that Spanish-language radio channels could be useful, while senior men remarked that radio can be an especially important way of receiving information when electricity is lost.

Across all listening sessions, social media was raised as a key source of information following a crisis; however, frequent use of social media was related to message content and delivery preferences for only a portion of the listening sessions. For example, college students – noteworthy as a group for their strong familiarity with such platforms as Twitter – preferred short, to-the-point messages that could be transmitted easily within a 140 character limit. However, consistent access to social media also was perceived as a potential challenge for

capturing audience attention. These same college students recommended that crisis-related messages be preceded by some sort of emergency signal to alert recipients to the nature of the message. These students also believed that non-critical information in the scenarios, such as anecdotes from members of the community about the personal effects of contamination, were extraneous, wasted time, and contributed to waning interest in the overall message. Even among college students, however, some participants noted that they themselves neither use nor trust Twitter.

In contrast, other listening sessions recognized the potential of social media for information sharing but touted it as more important for groups *other* than for their own. Secondary school teachers and administrators, for example, recognized Twitter as an important channel for reaching twenty- and thirty year olds, but felt it less vital for reaching older audiences. Similarly, some among the senior aged men's group specifically called out Twitter as a preferred communication outlet (but not all were users). African-American women cited Facebook as a good platform for reaching them during and after a crisis. Despite this variation in social media usage and preference across audience segments, as well as recent research indicating that health department accounts tend to be followed by other organizations rather than by individuals (Harris et al., 2014), local health department representatives described currently using the organizational Twitter feed for information dissemination directly to the populations they serve. For these reasons, organizations that play key roles in crisis response, mitigation, and resolution should proactively investigate the channel preferences of the varied constituencies in their service areas to ensure that appropriate plans are in place for reaching these audiences before, during, and after an incident.

Similarly, assumptions cannot be made regarding which individuals and organizations can be deemed credible for specific population segments. The perceived credibility of government agencies, for example, varied across listening sessions. African-American women and college students both specifically cited the CDC as a neutral party from which information could be trusted, although African-American women also noted the importance of hearing information from people directly affected by the crisis. Medical residents and local health department officials both referenced experiences with lay audiences who distrust government sources, while senior aged males specifically requested personal testing kits to verify any risk-related information provided by government agencies. Promotoras described the importance of information shared by members of their existing support networks, including family members, friends, and religious figures, while medical residents expressed a desire to have the information communicated by other medical, scientific, and public health experts rather than “politicians”. A lack of official spokespersons in some messages was deemed problematic by numerous listening sessions who noted that the apparent unwillingness of utility and local government representatives to go on the record considerably reduced message credibility. Thus, to ensure that post-crisis messages achieve optimal effectiveness, they must be provided by a suitable source, which requires knowledge about the specific beliefs of each target audience.

In terms of content, most listening sessions converged in their expressed desire for multiple messages so that the discussion of the circumstances related to the lifting of the DNU order are disaggregated from the legal actions taken against the perpetrator of the contamination. Many participants expressed that this particular news story should focus solely on the resumption of water usage (although one local health department staff member did note that it was “good” that the reports included information about the perpetrator’s capture). Participants did split in

their assessments of the representation of community voices in the segments, with college students particularly disinterested in hearing about one community member's plight with providing water for his dog, while other groups felt that inclusion of citizen responses "humanized" the crisis. Local health department representatives noted that the comprehensive messages had "too many different people talking – it became confusing."

Many participants noted missing information in the messages, although the specific focus of the desired information varied across groups. Medical residents, for example, felt the messages needed more specific information about the nature of the contaminant and symptoms experienced by those exposed, while African-American women, new immigrants, and senior aged men all wanted to know more about the pipe-flushing process, including why it was effective and any potential adverse effects related to the flush itself. Messages that included contact information for follow-up questions were generally better received across the listening sessions; however, both new immigrants and Promotoras expressed concern about the ability of their peers to fully understand the messages, particularly as even those messages that acknowledged cultural differences and provided multilingual contact information did so in English. This concern was borne out when one participant, upon hearing the newscaster close the story by announcing that the perpetrator would appear in court the following Wednesday, believed that "the water [would] be safe to drink again on Wednesday." Clearly, message content and the ordering of its constituent components must be carefully considered for each target audience to minimize the opportunities for such confusion while promoting optimal message efficacy.

4. A media toolkit is needed to better prepare journalists to understand environmental and health crises, communicate their potential impacts, and provide necessary response information to communities of concern.

By focusing the study design on media-filtered messages rather than on press releases or unfiltered organizational spokesperson statements, the research attempted to present the ways in which people actually receive messages. As such, the strategic omission of “ideal” message components and inclusion of related but seemingly “off-topic” risk message elements (such as information about the perpetrator) provided opportunities to assess the role that media choices can play in the reception and efficacy of important risk messages. In sum, that role is pivotal and must be considered in the strategic communications process during crisis response.

While we believe a risk communications toolkit that addresses post-contamination communication would be extremely useful, we are reluctant to design such a tool without including media representatives in the process. Consistent with CBPC, we propose that a purposefully selected group of journalists, broadcast media professionals, website managers, and commercial bloggers be invited to participate in the development of such a tool. The findings from this report should guide the toolkit content, giving the group empirically based information on which to base this working document. However, having media professionals guide the toolkit development will increase the credibility of the document for two reasons. First, these individuals have an inside, working knowledge of the challenges of deadlines, space or time allocations, and intricacies of gaining access to government officials and other key players that we can only approximate. Second, these professionals will be more confident of and apt to use a document that, while based in research, was created by their peers.

Engaging local media in a CBPC process could serve multiple purposes. One, of course, is the development of a toolkit that could both inform and assist in the rapid creation of news products during a crisis. An additional benefit could be the reconceptualization of what being a media partner in a community crisis means. For instance, in the scenario where the mayor and water company executive were unavailable for comment, what did this actually mean? Did they refuse to comment? Were they in meetings and genuinely unavailable? Might they be available for comment for a later broadcast? To a journalist, “not available for comment” is a routine statement. To many of the participants in the stakeholder listening sessions, the comment was laden with additional meaning (not caring, uninvolved, withholding information) that provoked negative responses (fear, anger, suspicion). Providing the truth is a journalistic ideal that is highly held and generally respected. However, understanding how to balance that with care for the public might be a goal of the toolkit development.

Documents that such a toolkit might include, but not be limited to, are:

- Contact information for organizational spokespersons (water, sewage, power, etc.).
- Description of emergency management response plans, along with responsible persons and phone numbers.
- Demographic composition of audience, including where language and cultural issues might be a barrier.
- Community organizations and outlets that could help address cultural barriers, including names and contact information.
- Boilerplate samples of effective media pieces (broadcast, print, social media, etc) that incorporate best practices recommendations.

## Quality Assurance: Study Limitations

Every effort was made to conduct the study using appropriate scientific methods and human subject protection. Listed below you will find a description of the limitations of the study for quality assurance purposes.

Underlying assumptions. We began Phase 2 of this study with several assumptions. The first was that following Best Practices strategies (described earlier in the report) yields more successful responses to disasters. The second was that the CBPC approach, which in this case involves engaging community members to determine the most effective message content and strategies, yields data that is significant to consider when modifying best practices strategies for post-contamination communication. We continue to support both of these approaches, while recognizing that they are assumptions (albeit with empirical support).

Selection of community partners. We attempted to recruit community partners representative of those key players who would be responsible for responding to and for mitigating an actual water contamination event in order to obtain input on possible scenarios, responses, and communication strategies. While we are confident that those recruited were important (and provided excellent cooperation and feedback), there is always the possibility that we missed other potential partners.

Recruitment of listening session participants. Similarly, we owe a debt of gratitude to those community members who, for no compensation other than a slice of pizza or a submarine sandwich, participated in the study. We were able to recruit a broad cross-section of community members but were certainly not able to represent every potential permutation of the population. However, it was also true that members of the listening sessions represented more than the single

demographic variable they were recruited to represent. Mothers and fathers, health professionals, church and civic leaders, and more spoke from each of these groups.

Development of trigger messages. The news stories used as conversation triggers in the listening sessions were based on our examination of actual cases and information provided by technical experts. They were obviously not inclusive of all possible combinations of the best practices strategies. However, we believe that the composition of the stories did allow for meaningful discussion in the listening sessions. The concerns expressed, as well as the notation of elements they liked, will be able to be used to craft more meaningful communicative interactions in the future. One difficulty was that this was a post-contamination message. In a real emergency, the public would have heard many messages describing the details of the water contamination event prior to this one about lifting the DNU order. In a real situation, some of the concerns that were raised in the listening sessions might have been addressed in news stories broadcast earlier in the crisis. However, given study goals and limitations, we could not provide an entire chronology of messages for participants.

## Implications for Best Practices for Risk Communication

1. Ensure that clear response plans exist and that they include clearly defined roles for those implicated in a crisis response and recovery, particularly regarding the decontamination and clearance phases of a crisis.

This finding is important, as it reinforces existing best practices for **planning ahead for a prompt response** and **continually evaluating and updating this plan**. However, interviews with technical experts and a listening session with local health department staff, confusion was expressed regarding which organization(s) would take the lead on post-crisis communication. Many individuals asserted that plans are in place to address water-related crises; however, when pressed about responsibility for taking leading recovery communication, each group believed another was in charge. For example, water utility representatives believed communication would be led by the public health sector, while public health representatives felt water utility districts would take the lead. It is important that such assumptions be interrogated and addressed *before* a crisis to minimize the possibility of confusion during decontamination and clearance.

2. Crisis planning should involve, to the fullest extent possible, members of the media who will be charged with providing information to the public.

Members of the media should be made aware of important message elements necessary to effectively communicate relevant facts and uncertainty without introducing or exacerbating panic. For example, organizations should incorporate response efficacy as a component of **efficacy messages** and should ensure that the media understand the importance of communicating this component during coverage.

Organizational spokespersons should ensure their availability to the media throughout the crisis and recovery periods so that they can provide and help interpret messages related to public health and safety. This reinforces existing best practices related to **meeting the needs of the media** and **communicating with openness**. Lack of spokesperson availability diminishes the perceived credibility of the message. When messages include such caveats as “water is potable EXCEPT FOR by vulnerable populations,” the message provided to the media should specify *why* there is a difference– thereby both acknowledging uncertainty and strengthening response efficacy components.

Ideally, journalists would be active partners in both the planning and implementation of risk communications, which would remind them of the trust the community places in them. However, for both resource and ethical reasons, such partnerships are not always feasible. Therefore, the research team recommends that organizations create media toolkits to assist members of the media in fulfilling their role as providers of important information while adhering to the Society of Professional Journalists’ Code of Ethics, which specifically calls for journalists to “minimize harm” by “recognize[ing] that gathering and reporting information may cause harm or discomfort” (SPJ, 1996).

### 3. The importance of informed audience segmentation cannot be overstated.

Cultural, demographic, and socio-economic differences across potentially-affected populations relate to variations in preferences for message content and delivery channels and illustrate wide variation in beliefs about credible information sources. For example:

- College students preferred bare-bones messages from authority figures and stated that they would then follow up, verifying information with such personal network influencers as their parents.

- Local health department staff cited frequent distrust of government officials by the populations they serve.
- Medical residents looked to federal agencies, such as the CDC, for accurate post-crisis information but felt that patient populations would prefer to hear post-incident recommendations directly from their own personal physicians.
- African-American women identified church leaders and community figures as key for effectively reaching their communities.

Such variation among audience segments has important implications for organizations and spokespersons in terms of when and how they should implement the best practices for risk communication.

When following the Best Practices guidance regarding **forming partnerships**, organizational leaders should ensure that they include members from the numerous publics that could be affected by an environmental crisis. These partnerships should span demographic, educational, and socio-economic spheres to support a true **communication network**. Such a network can effectively operationalize the existing Best Practice of **listening to the public's concerns and understanding the audiences**, while also identifying **credible sources for information distribution** that may vary widely across audiences so that stakeholder-specific needs are included in evolving crisis plans. By proactively **acknowledging and incorporating cultural differences**, organizations can better **plan** for delivering the most effective content, through the most appropriate channels, via the most credible sources when a crisis occurs.

4. The data from this phase supports the recommendation that the Best Practices model be expanded to include an additional practice, i.e., to communicate recovery efforts.

This best practice should focus on communicating corrective actions taken and improving community engagement. The inclusion of **communicating recovery efforts** in the Best Practices model will focus additional attention on the importance of post-crisis communication. While everyone is often relieved and exhausted once the precipitating crisis has passed, the post-crisis period may be when community members need to be the most active – and proactive. In addition to the practical implications for emergency managers, first-responders, journalists, and civic and community organizations, communicating recovery efforts is an important domain for risk communication scholars to continue to examine.

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## **Appendices**

1. Seven Cardinal Rules of Risk Communication
2. News Report Key and Scripts

## **Appendix 1. Seven Cardinal Rules of Risk Communication**

(Adapted by Dr. Vincent T. Covello from the [1988 EPA Seven Cardinal Rules of Risk Communication](#))

### **Rule 1. Accept and involve the public as a legitimate partner.**

Two basic tenets of risk communication in a democracy are generally understood and accepted. First, people and communities have a right to participate in decisions that affect their lives, their property, and the things they value. Second, the goal of risk communication should not be to diffuse public concerns or avoid action. The goal should be to produce an informed public that is involved, interested, reasonable, thoughtful, solution-oriented, and collaborative.

*Strategies:* Demonstrate respect for the public by involving the community early, before important decisions are made. Clarify that decisions about risks will be based not only on the magnitude of the risk but on factors of concern to the public. Involve all parties that have an interest or a stake in the particular risk in question. Adhere to highest moral and ethical standards: recognize that people hold you accountable.

### **Rule 2. Listen to the audience.**

People are often more concerned about issues such as trust, credibility, control, benefits, competence, voluntariness, fairness, empathy, caring, courtesy, and compassion than about mortality statistics and the details of quantitative risk assessment. If people feel or perceive that they are not being heard, they cannot be expected to listen. Effective risk communication is a two-way activity.

*Strategies:* Do not make assumptions about what people know, think or want done about risks. Take the time to find out what people are thinking: use techniques such as interviews, facilitated discussion groups, advisory groups, toll-free numbers, and surveys. Let all parties that have an interest or a stake in the issue be heard. Identify with your audience and try to put yourself in their place. Recognize people's emotions. Let people know that what they said has been understood, addressing their concerns as well as yours. Recognize the "hidden agendas," symbolic meanings, and broader social, cultural, economic or political considerations that often underlie and complicate the task of risk communication.

### **Rule 3. Be honest, frank, and open.**

Before a risk communication can be accepted, the messenger must be perceived as trustworthy and credible. Therefore, the first goal of risk communication is to

establish trust and credibility. Trust and credibility judgments are resistant to change once made. Short-term judgments of trust and credibility are based largely on verbal and nonverbal communications. Long term judgments of trust and credibility are based largely on actions and performance. In communicating risk information, trust and credibility are a spokesperson's most precious assets. Trust and credibility are difficult to obtain. Once lost they are almost impossible to regain.

*Strategies:* State credentials; but do not ask or expect to be trusted by the public. If an answer is unknown or uncertain, express willingness to get back to the questioner with answers. Make corrections if errors are made. Disclose risk information as soon as possible (emphasizing appropriate reservations about reliability). Do not minimize or exaggerate the level of risk. Speculate only with great caution. If in doubt, lean toward sharing more information, not less - or people may think something significant is being hidden. Discuss data uncertainties, strengths and weaknesses - including the ones identified by other credible sources. Identify worst-case estimates as such, and cite ranges of risk estimates when appropriate.

#### **Rule 4. Coordinate and collaborate with other credible sources**

Allies can be effective in helping communicate risk information. Few things make risk communication more difficult than conflicts or public disagreements with other credible sources.

*Strategies:* Take time to coordinate all inter-organizational and intraorganizational communications. Devote effort and resources to the slow, hard work of building bridges, partnerships, and alliances with other organizations. Use credible and authoritative intermediaries. Consult with others to determine who is best able to answer questions about risk. Try to issue communications jointly with other trustworthy sources such as credible university scientists, physicians, citizen advisory groups, trusted local officials, and national or local opinion leaders.

#### **Rule 5. Meet the needs of the media.**

The media are a prime transmitter of information on risks. They play a critical role in setting agendas and in determining outcomes. The media are generally more interested in politics than in risk; more interested in simplicity than in complexity; and more interested in wrongdoing, blame and danger than in safety.

*Strategies:* Be open with and accessible to reporters. Respect their deadlines. Provide information tailored to the needs of each type of media, such as sound bites, graphics and other visual aids for television. Agree with the reporter in advance about the specific topic of the interview; stick to the topic in the interview. Prepare a limited number of positive key messages in advance and

repeat the messages several times during the interview. Provide background material on complex risk issues. Do not speculate. Say only those things that you are willing to have repeated: everything you say in an interview is on the record. Keep interviews short. Follow up on stories with praise or criticism, as warranted. Try to establish long term relationships of trust with specific editors and reporters.

### **Rule 6. Speak clearly and with compassion.**

Technical language and jargon are useful as professional shorthand. But they are barriers to successful communication with the public. In low trust, high concern situations, empathy and caring often carry more weight than numbers and technical facts.

*Strategies:* Use clear, nontechnical language. Be sensitive to local norms, such as speech and dress. Strive for brevity, but respect people's information needs and offer to provide more information. Use graphics and other pictorial material to clarify messages. Personalize risk data: use stories, examples, and anecdotes that make technical data come alive. Avoid distant, abstract, unfeeling language about deaths, injuries and illnesses. Acknowledge and respond (both in words and with actions) to emotions that people express, such as anxiety, fear, anger, outrage, and helplessness. Acknowledge and respond to the distinctions that the public views as important in evaluating risks. Use risk comparisons to help put risks in perspective; but avoid comparisons that ignore distinctions that people consider important. Always try to include a discussion of actions that are under way or can be taken. Promise only that which can be delivered, and follow through. Acknowledge, and say, that any illness injury or death is a tragedy and to be avoided.

### **Rule 7. Plan carefully and evaluate performance.**

Different goals, audiences, and media require different risk communication strategies. Risk communication will be successful only if carefully planned and evaluated.

*Strategies:* Begin with clear, explicit objectives - such as providing information to the public, providing reassurance, encouraging protective action and behavior change, stimulating emergency response, or involving stakeholders in dialogue and joint problem solving. Evaluate technical information about risks and know its strengths and weaknesses. Identify important stakeholders and subgroups within the audience. Aim communications at specific stakeholders and subgroups in the audience. Recruit spokespersons with effective presentation and human interaction skills. Train staff - including technical staff - in communication skills: recognize and reward outstanding performance. Pretest messages. Carefully evaluate efforts and learn from mistakes.

## Appendix 2. Risk Communication Study Radio Scripts

### CHARACTERS

Amanda Smith, radio news anchor

Jim Greer, radio news field reporter

Dr. Lucy Snow, St. Christopher's Community Hospital

Rick Strunk, Residential Water Customer

Mayor Sandra Foster

Walter Jackson, Water Utility District Director

### COLOR CODING

The color coding on the followings scripts denotes strategic message component derived from Best Practices strategies and varies by script. Designation of colors is described at the beginning of each of the six scripts.

<b>Character</b>	<b>Role</b>
Amanda Smith	Radio News Anchor
Jim Greer	Radio News Field Reporter
Dr. Lucy Snow	Doctor at St. Christopher' Community Hospital
Rick Strunk	Residential Water Consumer
Sandra Foster	Mayor
Walter Jackson	Water Utility District Director

**RADIO SCRIPT**  
**V 1.1 (COMMUNITY VOICE)**

**Voiced Characters**

Amanda Smith, radio news anchor

Jim Greer, radio news field reporter

Dr. Lucy Snow, St. Christopher's Community Hospital

Rick Strunk, Residential Water Customer

**INTRODUCTION**

*AMANDA SMITH:* This is Action News at 6. Today's top story: the Do-Not-Use Water Order that has been in place since last week's water contamination crisis has been lifted today. For more on this breaking news, we go to Jim Greer live at City Hall.

**BACKGROUND (standard)**

*JIM GREER:* Thank you, Amanda. It's hard to believe that nine days have passed since suspect Jeremy Osbourne intentionally introduced deadly spores into the water supply that serves the southeastern quarter of the city. Since that day, more than 12,000 residential customers, dozens of businesses, two elementary schools and the community hospital were severely impacted by the Do-Not-Use order designed to help reduce the number of contamination-related illnesses. But after more than a week of clean-up and testing, City Hall and the Water Utility District issued a joint statement this afternoon saying that, finally, our drinking water is back to national safety standards and residents and businesses can now use their taps again.

**VARIABLES**

[Community Voices, Compassion, No Efficacy, No Cultural Differences, No Network/Partnerships, No Spokesperson]

*JIM GREER [continued]:* In the release, Mayor Sandra Foster and Water Utility District Director Walter Jackson expressed their thanks and concern for the individuals and families who have – quote – “endured both discomfort and worries during this difficult time.” In the hours after the contamination, local hospitals saw more than 250 children come in with severe gastrointestinal symptoms, eventually prompting the investigation that led to the Do-Not-Use order and, ultimately, to Osbourne's arrest. I spoke this afternoon with Dr. Lucy Snow, Chief of Pediatrics at St. Christopher's Community Hospital about that day.

*LUCY SNOW:* When we saw the first children coming in from Southern Elementary with gastrointestinal complaints, we initially thought we were dealing with a localized foodborne contamination. But when children from Eastern Elementary started arriving with the same issues, we knew it had to be something else. We were glad that the Do-Not-Use order was issued promptly to help minimize the number of illnesses. Without it, the situation could have been much worse.

*JIM GREER:* While the medical community praised the order, residential water customers like Rick Strunk were happy to see it lifted.

**RICK STRUNK:** It's definitely been a rough week without being able to get water from my tap. But in light of everything that's happened, I'm just grateful it wasn't worse than it was. It'll be good to be able to get the dogs their water from the sink instead of the refrigerator again.

*[chuckles]*

**JIM GREER:** This has been Jim Greer reporting live from City Hall.

**CLOSE**

**AMANDA SMITH:** Thank you, Jim. Jeremy Osbourne is scheduled to appear in court next Wednesday. Action News had hoped to bring you live remarks today directly from the Mayor and Mr. Jackson; however, **neither was available for additional comment this afternoon.** We will continue to cover developments in this case as they occur.

**RADIO SCRIPT**  
**V 1.2 (NO COMMUNITY VOICE)**

**Voiced Characters**

Amanda Smith, radio news anchor  
Jim Greer, radio news field reporter  
Mayor Sandra Foster  
Walter Jackson, Water Utility District Director

**INTRODUCTION**

*AMANDA SMITH:* This is Action News at 6. Today's top story: the Do-Not-Use Water Order that has been in place since last week's water contamination crisis has been lifted today. For more on this breaking news, we go to Jim Greer live at City Hall.

**BACKGROUND (standard)**

*JIM GREER:* Thank you, Amanda. It's hard to believe that nine days have passed since suspect Jeremy Osbourne intentionally introduced deadly spores into the water supply that serves the southeastern quarter of the city. Since that day, more than 12,000 residential customers, dozens of businesses, two elementary schools and the community hospital were severely impacted by the Do-Not-Use order designed to help reduce the number of contamination-related illnesses. But after more than a week of clean-up and testing, City Hall and the Water Utility District issued a joint statement this afternoon saying that, finally, our drinking water is back to national safety standards and residents and businesses can now use their taps again.

**VARIABLES**

[NO Community Voices, NO Compassion, **Efficacy**, **Cultural Differences**, **Network/Partnerships**, **Spokesperson**]

*JIM GREER [continued]:* In making the announcement, Mayor Sandra Foster personally thanked emergency responders and others who have worked on this issue for the last nine days.

*MAYOR FOSTER:* We're glad that our citizens will be able to use their water safely again. Our city's Emergency Response Team has acted quickly and collaboratively over the last several days to minimize the damage from this crisis. Local hospitals, emergency responders, city officials, and the Water Utility District put into action plans that have been in place for years but that we had hoped we would never have to use. In the end, we feel sure that fewer people became ill and that the perpetrator was caught more quickly because of groundwork that we have been laying together for a very long time. We also appreciate our local media, including *La Voz* newspaper, for helping our diverse community respond quickly to this situation as it developed.

*Jim Greer [continued]:* Water Utility District Director Walter Jackson echoed the Mayor's comments and provided additional steps that residents can take to help ensure the safety of their water.

*WALTER JACKSON:* While our monitoring tells us that the water supply has returned to its pre-contamination state, we do **recommend that customers allow their taps** to run for approximately

five minutes before first use. Doing this will help clear the pipes of build-up that might have occurred during this lengthy Do-Not-Use period. If customers have any questions or concerns about this process, they should visit our website – WUD.com or call our helpline at 555-5555. **We have English-, Spanish-, and French-speaking operators** available to provide information, and we can connect customers to local community groups if they need more personalized assistance.

*JIM GREER:* That number again is 555-5555. This has been Jim Greer reporting live from City Hall.

**CLOSE**

*AMANDA SMITH:* Thank you, Jim. Jeremy Osbourne is scheduled to appear in court next Wednesday. We will continue to cover developments in this case as they occur.

## RADIO SCRIPT

### V 2.1 (ACKNOWLEDGES PUBLIC CONCERNS)

#### Voiced Characters

Amanda Smith, radio news anchor

Jim Greer, radio news field reporter

#### INTRODUCTION

*AMANDA SMITH:* This is Action News at 6. Today's top story: the Do-Not-Use Water Order that has been in place since last week's water contamination crisis has been lifted today. For more on this breaking news, we go to Jim Greer live at City Hall.

#### BACKGROUND (standard)

*JIM GREER:* Thank you, Amanda. It's hard to believe that nine days have passed since suspect Jeremy Osbourne intentionally introduced deadly spores into the water supply that serves the southeastern quarter of the city. Since that day, more than 12,000 residential customers, dozens of businesses, two elementary schools and the community hospital were severely impacted by the Do-Not-Use order designed to help reduce the number of contamination-related illnesses. But after more than a week of clean-up and testing, City Hall and the Water Utility District issued a joint statement this afternoon saying that, finally, our drinking water is back to national safety standards and residents and businesses can now use their taps again.

#### VARIABLES

[Acknowledges Public Concern, Compassion, Efficacy, Cultural Differences, No Network/Partnerships, No Spokesperson]

*JIM GREER [continued]:* In the joint statement, Mayor Sandra Foster and Water Utility District Director Walter Jackson expressed their thanks and concern for the individuals and families who have – quote – “endured both discomfort and worries during this difficult time.”

According to the joint statement, the Water Utility District is confident that the water supply has returned to its pre-contamination state. They however recommend that customers allow their taps to run for approximately five minutes before first use. Doing this, the statement continued, will help clear the pipes of build-up that might have occurred during this lengthy Do-Not-Use period. The statement directed customers who have any questions or concerns related to personal safety, family safety or pet safety to visit the Water Utility District multilingual website – WUD.com or call the helpline at 555-5555. The Water Utility District has English-, Spanish-, and French-speaking operators available to provide information and connect customers to local community groups if they need more personalized assistance.

They concluded by saying “We understand that people are worried about their safety and the safety of their loved ones, but we assure you that we have taken all possible steps to rectify the situation.”

*JIM GREER:* That number again is 555-5555. This has been Jim Greer reporting live from City Hall.

**CLOSE**

*AMANDA SMITH:* Thank you, Jim. Jeremy Osbourne is scheduled to appear in court next Wednesday. Action News had hoped to bring you live remarks today directly from the Mayor and Mr. Jackson; however, neither was available for additional comment this afternoon. We will continue to cover developments in this case as they occur.

## RADIO SCRIPT

### V 2.2 (NO ACKNOWLEDGEMENT OF PUBLIC CONCERNS)

#### Voiced Characters

Amanda Smith, radio news anchor

Jim Greer, radio news field reporter

Mayor Sandra Foster

#### INTRODUCTION

*AMANDA SMITH:* This is Action News at 6. Today's top story: the Do-Not-Use Water Order that has been in place since last week's water contamination crisis has been lifted today. For more on this breaking news, we go to Jim Greer live at City Hall.

#### BACKGROUND (standard)

*JIM GREER:* Thank you, Amanda. It's hard to believe that nine days have passed since suspect Jeremy Osbourne intentionally introduced deadly spores into the water supply that serves the southeastern quarter of the city. Since that day, more than 12,000 residential customers, dozens of businesses, two elementary schools and the community hospital were severely impacted by the Do-Not-Use order designed to help reduce the number of contamination-related illnesses. But after more than a week of clean-up and testing, City Hall and the Water Utility District issued a joint statement this afternoon saying that, finally, our drinking water is back to national safety standards and residents and businesses can now use their taps again.

#### VARIABLES

[No Acknowledgement of Public Concerns, No Compassion, No Efficacy, No Cultural Differences, Network/Partnerships, Spokesperson]

*JIM GREER [continued]:* In making the announcement, Mayor Sandra Foster personally thanked emergency responders and others who have worked on this issue for the last nine days.

*MAYOR FOSTER:* We're glad that our citizens will be able to use their water safely again. Our city's Emergency Response Team has acted quickly and collaboratively over the last several days to minimize the damage from this crisis. Local hospitals, emergency responders, city officials, and the Water Utility District put into action plans that have been in place for years but that we had hoped we would never have to use. In the end, we feel sure that fewer people became ill and that the perpetrator was caught more quickly because of groundwork that we have been laying together for a very long time. We also appreciate our local media for helping our community respond quickly to this situation as it developed.

*JIM GREER:* This has been Jim Greer reporting live from City Hall.

#### CLOSE

*AMANDA SMITH:* Thank you, Jim. Jeremy Osbourne is scheduled to appear in court next Wednesday. We will continue to cover developments in this case as they occur.

**RADIO SCRIPT**  
**V 3.1 (ACKNOWLEDGES UNCERTAINTY)**

**Voiced Characters**

Amanda Smith, radio news anchor

Jim Greer, radio news field reporter

**INTRODUCTION**

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**VARIABLES**

[Acknowledges Uncertainty, Compassion, Efficacy, Cultural Differences, No Network/Partnerships, No Spokesperson]

*JIM GREER [continued]:* In the joint statement, Mayor Sandra Foster and Water Utility District Director Walter Jackson expressed their thanks and concern for the individuals and families who have – quote – “endured both discomfort and worries during this difficult time.”

According to the joint statement, the Water Utility District is confident that the water supply has returned to its pre-contamination state. They however recommend that customers allow their taps to run for approximately five minutes before first use. Doing this, the statement continued, will help clear the pipes of build-up that might have occurred during this lengthy Do-Not-Use period. The statement also warns that while our water is within national and state safety standards, still the elderly, those with compromised immune systems and babies should not drink the water for the next few days until some more critical tests are completed

The statement directed customers who have any questions or concerns related to personal safety, family safety or pet safety to visit the Water Utility District multilingual website – WUD.com or call the helpline at 555-5555. The Water Utility District has English-, Spanish-, and French-speaking operators available to provide information and connect customers to local community groups if they need more personalized assistance.

*JIM GREER:* That number again is 555-5555. This has been Jim Greer reporting live from City Hall.

**CLOSE**

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#### **VARIABLES**

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*JIM GREER [continued]:* In the joint statement, Mayor Sandra Foster and Water Utility District Director thanked emergency responders and others who have worked on this issue for the last nine days.

The statement also thanked the local media, including *La Voz* newspaper, for helping the city's diverse community respond quickly to this situation as it developed.

According to the joint statement, the Water Utility District is confident that the water supply has returned to its pre-contamination state.

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ISSUE



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