Verification analysis of formative research for the development of public communication messages for a plague outbreak

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I. Executive Summary

The threat of terrorism has stimulated much activity within the public health community since the fall of 2001. One priority has been the preparation of communication plans and materials for the general public. To this end, the Centers for Disease Control and Prevention and the Association of Schools of Public Health funded the "Pre-Event Message Development Project" (PMDP). In the first two years of the project, the four selected schools of public health (University of Alabama-Birmingham (UAB), Saint Louis University (SLU), University of California at Los Angeles (UCLA), and the University of Oklahoma (UOK)) conducted formative research with audience segments across the country. The focus groups were designed as formative research to inform development and pre-testing of message materials for release to the public in the event of the intentional release of biological, chemical or radiological weapons in the U.S. In the second year, message materials were developed and pre-tested by partner schools. Findings from Year Two were used to edit and refine the message materials for distribution via the web, broadcast news media, and through local public health agencies, that were subsequently vetted and cleared for use by the CDC.

As a final stage for the PMDP, the partner schools undertook to verify the findings from Years 1 and 2 of the project by comparing them with relevant research available in the published and unpublished literature. Specifically, the verification analysis compares the PMDP results to available qualitative and quantitative research. The analysis assesses the extent to which the PMDP results correspond to or contradict other research on comparable topics and specifies instances where the PMDP has identified new and unique results. Carried out by the SLU study team, this report presents the findings of the literature review in relation to the results of the formative research on plague.

Findings

Public knowledge of infectious disease. Consistent with the literature showing limited knowledge of the transmission, prevention and treatment of infectious disease, the PMDP indicated that the general public has limited understanding of plague. In the case of an emergency or disease outbreak it is important that basic information on the agent or disease be provided to the general public. Information on transmission, treatment, severity and other important aspects of the disease or agent will need to be provided to the general public. Emergency responders and emergency personnel cannot assume that the public has basic information on agents or disease.

Information needs in the event of hypothetical attack using plague. Consistent with the literature, the PMDP found that the public audience will seek detailed actionable information about what to do to protect themselves and their loved ones in the event of a terrorist attack. The general public will look for detailed information about: the nature of the threat, action steps to protect themselves and loved ones, and how the government is responding. Specific action steps will depend on the proximity and other circumstances specific to the threat.

Information seeking in the event of hypothetical attack using plague. The PMDP findings and existing research provide powerful corroborating evidence about how and where members of the public will turn for information in the event of a terrorist emergency. It is clear that the public

will look for emergency information from the broadcast media and from local agencies; urban populations will favor the former, and rural populations the latter. Urban or rural, local media and official sources will be important in the event of an attack in a specific community. People will compare different information sources as a way of validating the accuracy of the information they are getting, so it is important that different sources be consistent in what they say. Over time, people will turn to the internet and print media for more detailed news and analysis about a specific event.

Public actions in the event of a hypothetical attack using plague. Consistent with past research, the PMDP showed that members of the public will take various actions in response to a terrorist attack. While not all of the actions are consistent with government directives, they make sense to the study participants, depending on their circumstances. For example, study participants report that they will look for information from health care providers, stockpile food and water, and take precautions to prevent infection, such as fleeing from the scene. PMDP findings are validated by other research conducted during real rather than hypothetical events. Public health professionals and other emergency responders will need to provide the public with information on preventive actions that the public may take to protect themselves, and provide background information that explains why those actions need to be taken and how taking the action will protect the public.

Emotional and psychological responses to a hypothetical attack using plague. As in past research, the PMDP findings showed that people reacted to terrorist attacks with fear, shock and disbelief. Emergency responders need to understand the psychological state that the public is in when communicating during an event. Emergency communication strategies should provide action steps for people to take.

Confidence in government. Consistent with the literature, the PMDP study found that members of the public believe that their communities are ill-prepared for emergencies, and it seems likely that these negatively affect their trust in government response. The PMDP study confirms prior research suggesting that the more open officials are about their efforts, the more the public will trust and cooperate with public health directives. Similarly, local officials and emergency responders should disclose efforts to improve preparedness. It is also important that many levels of government be involved in the emergency response activities, as local officials are sometimes trusted more than national ones and vice versa.

Perceptions of media materials. Overall, perceptions of the media appear to be fairly positive in the case of an actual emergency event. Like the quantitative studies, the PMDP found that the media was a useful and important source of information; the public responded positively to timely information that was not too negative or too sensational. The news media play an important role in releasing information about an on-going event and steps the public can take to stay safe. Including clear and accurate precautionary steps is important to reassure the public and provide actions citizens can take. Some research also suggests that the news media can have an effect on the public's trust in government's ability to handle situations in the immediate aftermath of an emergency. Varied media use by different audience segments indicates that the media strategy must be broad-based.

Emotional and psychological response to media materials. The PMDP findings were consistent with those of prior studies in suggesting that exposure to media coverage about an event can also contribute to increased fear. PMDP participants said that radio and television segments caused greater fear and anxiety. The PMDP found that provision of actionable information could help to calm the public however. The PMDP findings are consistent with the existing literature in showing that news coverage and information about emergencies can have emotional and psychological effects on audience members. However, our research also shows that actionable messages can be reassuring for the public. Providing adequate and correct information may help to alleviate the stress felt by the public. It is important that those responsible for providing messages to the public include accurate information about steps people can take to keep themselves and their families safe.

Implications

- The public in the PMDP and the verification studies reported a need for specific information about what action steps to take in the event of an attack. This information should be provided to the public in clear language and a timely manner.

- Information provided to the public needs to be perceived as open, honest, comprehensive, and simple to understand. When asking the public to take a specific action, government officials and emergency responders need to provide rationales and explanations for recommended actions, and the likely outcomes of the actions.

- The public trusted a number of different sources of information; for many the federal government was the least trusted source. Including many levels of government, emergency response agencies, the local media, and medical professionals in the communication process can help to encourage the public to respond appropriately to the disaster at hand.

- The public indicated that the main source of information would be media sources, specifically television. Emergency professionals need to have open lines of communication with the media in order to get all of the crucial information out to the media as early as possible. Emergency response officials should start to cultivate these relationships before emergencies happen.

- Many studies indicate that members of the public will look to multiple sources to verify information. Information being provided across different media and from official agencies and organizations needs to be consistent. Mixed messages are likely to lead to reduced levels of adherence to directives.

- Emotional and psychological responses to real or hypothetical events were similar, many stating anxiety, shock, and fear. Messages and communication directed to the general public should take this into consideration. Actionable messages with advice on how to keep loved ones safe may provide members of the public a sense of control and reassure them in the face of uncertainty.

- Message and dissemination strategies need to be developed with audience characteristics in mind. Results of both the PMDP and the verification studies found that characteristics such as age, race, location, and previous exposure to events may moderate response to messages.

- Communities should provide information about emergency response preparations to the public. Knowing that steps are being taken may help the public feel more confident in emergency preparedness and may help increase public trust.

Introduction

The threat of terrorism has stimulated much activity within the public health community since the fall of 2001. One priority has been to assure that the health care system has the capacity to respond in an emergency. Drug stockpiles, emergency system improvements, and health provider and first responder training have been mobilized at national, state and local levels. Another priority has been the preparation of communication plans and materials for the general public. To this end, the Centers for Disease Control and Prevention and the Association of Schools of Public Health funded the "Pre-Event Message Development Project" (PMDP). Through a competitive application process, four schools of public health were selected to carry out this work: University of Alabama-Birmingham (UAB), University of California at Los Angeles (UCLA), the University of Oklahoma (UOK), and Saint Louis University (SLU). Principal Investigators from a number of disciplines have collaborated to develop and assess informational messages using common standardized research and analysis protocols.

During Year One of data collection the study teams at all four universities, and two other contracted universities, conducted focus groups with public audience segments including rural and urban Caucasians, African Americans, and Hispanics, rural Native Americans, and urban Asians and English as a Second Language students. The focus groups were designed as formative research to inform development and pre-testing of message materials for release to the public in the event of the intentional release of biological, chemical or radiological weapons in the U.S. The study teams conducted focus groups regarding threats identified as priorities by the CDC: plague, botulism, VX gas, and dirty bombs. The group participants responded to questions about the following constructs (focus group scripts can be seen in Appendix A).

- Pre-event knowledge about biological, chemical and radiological threats;
- Information needs in the event of an attack;
- Information seeking and other behavior in the event of an attack; and
- Confidence in government and public health response to a potential attack.

Audiotapes of focus groups were transcribed for analysis. Partner schools were assigned analysis and interpretation of focus group regarding specific agents: Saint Louis University analyzed and reported on the transcripts from all the groups about plague. In depth findings from the Year One research can be found elsewhere [1-5].

In Year Two, formative research findings were used to develop creative briefs that informed the writing and design of radio, television and print educational materials. Partner schools concentrated on the same specific agents: Saint Louis University developed message materials on plague. Draft materials were reviewed by collaborating partner schools for readability, and by CDC content experts for accuracy. Partner schools then pre-tested draft message materials with the same audience segments through cognitive response interviews and focus groups.

The focus group participants responded to questions about the following constructs:

- Comprehension of materials;
- Emotional response to materials;

- Believability of materials;
- Recommendations for improvement of the materials;
- Self-efficacy and response-efficacy; and
- Intention to follow advice of materials.

Cognitive response testing looked specifically at comprehension of and emotional response to the materials. Focus groups and cognitive response interviews were transcribed and analyzed. Again, Saint Louis University focused on the transcripts regarding plague. Findings from Year Two were used to edit and refine the message materials for distribution via the web, broadcast news media, and through local public health agencies, which have subsequently been vetted and cleared for use by the CDC. The PMDP has made a substantial contribution to the development of a framework for formulating and marketing messages concerning terrorist threats that, through content control and correct media selection, will reach a broad spectrum of population sub-groups. Specific findings from the Year Two focus groups and interviews have been reported to the Office of Communication in written reports and oral presentations.

As a final stage for the project, the partner schools undertook to verify the findings of the formative research and pretesting results from Years One and Two of the project by comparing them with relevant research available in the published literature. Specifically, the verification analysis compares the PMDP results to available qualitative and quantitative data, including national opinion poll results, public health surveys, and focus group studies.

This report presents the findings of the literature review in relation to the results of the formative research on plague. The SLU study team conducted the literature review, analysis of the findings, and report writing. We first present standardized methods used across schools to identify relevant literature. Findings are organized according to research topic or domain (e.g. information seeking strategies in the event of an emergency), with each section ending with a summary. We conclude with a discussion section and implications for emergency response communication.

II. Methods

The verification analysis is a systematic review and comparison of available relevant research findings with those of the PMDP. The comparison seeks to evaluate the extent to which the PMDP results correspond to or contradict other research on comparable topics, to understand why any contradictions appear, and to specify instances where the PMDP has identified new and unique results.

Researchers searched various databases using search terms standardized across the four schools to obtain articles on topics that corresponded with the PMDP. These standardized search terms were adapted according to the nature of the specific threat each school was assigned to. For the plague analysis, we concentrated on terms related to communication topics and public perceptions, in combination with terms related to biological agents and infectious disease. The search terms used can be seen in Appendix B. The researcher searching the database scanned titles and abstracts to determine if the articles were at all related to the PMDP research. Any

article that could be related was put into the second round of inclusion, and full text copies were obtained if possible.

For the second round of inclusion research teams used standardized inclusion/exclusion criteria to select from the first round articles; these criteria were used by all four partner schools. Inclusion criteria corresponded to data collected in the PMDP; articles selected for analysis had to contain original research about the public and not professionals, and include a focus on communication and not disease etiology (see Appendix C for inclusion guide). To obtain reliability, two researchers reviewed each article for inclusion. The pair met to reach consensus for those articles about which they disagreed. Selected articles were compiled for the verification analysis.

For the verification analysis, study team members individually reviewed each article, and coded them according to specific categories in a database. The articles were reviewed and coded according to a standard set of categories agreed to by the partner schools. The database structure classified the articles by study method (qualitative or quantitative), type of data collection, topic area, and by other search terms. Researchers also summarized the results of each article according to topic areas related to the PMDP findings (see Appendix D for database structure). The database created a way to easily and efficiently search for articles that reported findings comparable or relevant to PMDP topics using subject terms.

Researchers then reviewed all the articles reporting on research comparable to each of the topics assessed for the PMDP research. In the review of research related to each PMDP topic, analysts looked for similarities and differences between existing research and the findings of the PMDP.

III. Results

For each PMDP topic, the results are reported as follows. First, the original PMDP findings are presented, obtained from the original research reports submitted to the CDC for Years One and Two [6, 7]. Then the comparable research findings obtained through the verification analysis literature search are presented in the following sequence: quantitative studies, qualitative studies, and analyses of ethnic and regional differences. Finally, a topic summary reports where the PMDP results confirm or agree with existing research, where and why the PMDP research differ from the existing research, where the PMDP research contributes new and unique findings to the literature, and implications for emergency risk communication.

Public knowledge of infectious disease

PMDP findings

Focus group participants displayed a range of knowledge regarding chemical, biological, and radiological agents. Urban African American and Caucasian as well as rural Caucasian groups were better able to give correct information about the three categories of threats. Rural African American, Native American, Asian and ESL groups had the most trouble distinguishing among the threats and did not appear to have a general understanding of biological agents. An urban

African American group noted the difficulty of distinguishing between intentional release and natural outbreak in the case of infectious disease.

Quantitative analysis

Those studies that looked at agent knowledge were mostly quantitative telephone surveys [8-13], with the exception of one electronic survey [14]. The Blendon Smallpox Study (N = 1006) [8], Blendon SARS Studies (N = 5765; N = 501 in Canada, 1025 in the United States) [10, 12] and Blendon 2003 (review of five different surveys) [9] included United States national random samples. The Singapore SARS Study (N = 1202) [11] looked at a random national sample in Singapore. These surveys looked at knowledge about smallpox and SARS. While not specifically looking at plague, smallpox is an infectious disease that may be used as a biological weapon, and SARS is a highly contagious infectious disease with the potential to cause an epidemic. Smallpox knowledge was low in the American public with many participants having a limited understanding of transmission, the protective nature of vaccination after exposure, and treatment [8, 9, 13]. Knowledge surveys about SARS were conducted in Singapore [11], the United States [10, 12], Netherlands (N = 373) [14] and Canada [10, 12]. US and Canadian survey participants understood SARS was contagious and how it was transmitted but struggled with treatment information. Singapore adults had a generally good understanding of SARS transmission, treatment, and severity, while those adults from the Netherlands struggled with understanding the severity of the disease. A paper and pencil survey (N= 153) of US participants' understanding of Rift Valley Fever, found understanding of transmission in this population was limited [15].

The only qualitative study that looked at knowledge about plague was an interview study in India. The India Plague Study interviewed 1127 lower income persons living in India; investigating knowledge about plague and preventive measures. Researchers from the India Plague Study found that participants understood symptoms and transmission, but not the different types of plague, treatment, and the disease incubation period [16].

Qualitative analysis

No qualitative research was found on the topic.

Ethnic and area differences

Research indicates common limited understanding of infectious diseases that could be used in a terrorist event, or could have outbreaks that resemble those possible after a bioterrorism attack in a number of countries around the world. US studies found limited knowledge related to Rift Valley Fever [15], smallpox and SARS [8-10, 12].

Summary

Common findings. The PMDP findings confirmed the extant literature in the following areas: the PMDP findings indicated that the general public has limited understanding of plague. This result is consistent with published findings of limited knowledge of other infectious agents comparable to plague in terms of their potential for use as terrorist weapons (smallpox), or for their potential to disrupt civic life (SARS). Specifically the PMDP study agreed with the findings of a number of national random digit dial surveys.

Different findings. The PMDP findings did not contradict the published literature in any area. The existing literature and the PMDP show different, complementary results, however. Other research inquired about infectious diseases not studied in the PMDP, and found that study participants have limited knowledge about a variety of infectious diseases. The literature shows that general public audiences around the world generally have limited knowledge about the transmission, prevention, and treatment of specific infectious diseases such as SARS, smallpox and Rift Valley Fever. The PMDP did not ask questions to gauge knowledge of transmission, prevention, and treatment of plague.

PMDP contributions. The PMDP literature adds to the existing literature in useful ways. The PMDP found that participants struggled to understand how biological agents differed from radiology and chemical agent, distinctions not asked about in other studies. The PMDP also shows that although knowledge of four different agents is limited across major ethnic groups and parts of the country, urban groups appeared to be more knowledgeable, and some ethnic minority groups, including new immigrants, appeared to be less so. Existing studies do not report differences by ethnicity, or place of residence.

Implications: In the case of an emergency or disease outbreak it is important that basic information on the agent or disease be provided to the general public including: information on transmission, treatment, severity and other important aspects of the disease or agent. Emergency responders and emergency personnel cannot assume that the public has basic information on agents or disease.

Information needs in the event of hypothetical attack using plague

PMDP Findings

The PMDP Year 1 findings showed that the public would look for a variety of information in the event of a terrorist attack, including: the nature of the threat; steps to avoid exposure, prevent infection, recognize symptoms, and treat infection; and event specific information. Study participants wanted specific action steps they could take if they knew they had *not* been exposed, if they thought they *might* have been exposed or had contact with someone who had been exposed, or if they *knew* they had been exposed. Overall, the public needs detailed information about how to recognize, prevent, or treat disease. Specific action steps may improve response to an event. Information provided needs to be easy to understand. Participants were also concerned about how to prevent transmission of plague via pets and farm animals.

The PMDP Year 2 findings reported participant requests for further detailed information in their responses to draft the message materials. Participants wanted to know more local contact information, the types of antibiotics used to treat plague, and any long-term effects from taking the drugs.

Quantitative Analysis

The Blendon Smallpox Study [8], a national survey of 1006 Americans about smallpox found that participants needed information about vaccinate effectiveness, disease treatment, and disease history. Another American public opinion survey, the Pollard Anthrax Surveys, conducted before and after the 2001 anthrax attacks, found that the public expected explanations of germ

transmission, steps to minimize risk, and treatment [17]. In a study looking at the information requests received by the CDC during the anthrax outbreaks, the CDC received information requests regarding the availability of anthrax vaccine (58.4% of phone calls), general information about bioterrorism (14%), personal protective equipment (12%), and smallpox (9%)[18].

In a French study [19] (N=2433) which surveyed the general public living near dangerous production plants before and after a plant explosion, the participants reported needing information on how to react to a catastrophe and how to recognize warning signals [19] prior to an event. Two American studies also looked at knowledge needed prior to an event: the 2004 Columbia University Study which included a national sample (participant number not included) [20] and the second study, a 2003 Columbia University Study, included a national sample of 1,373 and 1,317 New York City participants [21]. Participants wanted knowledge regarding community emergency plans as well as school emergency plans [20, 21], workplace emergency plans [21], and how to create family emergency plans [20].

Qualitative Analysis

In a qualitative study of public response in a bioterrorism emergency with 12 focus groups (N=112) in Rhode Island, participants stated they did not take any precautionary actions because they did not know what to do, that they would like basic information on where to go and what to do, and more information about how the state is preparing to respond to the emergency. In the Rhode Island Study, participants wanted basic information, without too many details [22]. In another study, using street interviews and a convenience sample, with the general public and school teachers in New York City a number of participants stated that they were inundated with advice and directives. Other participants requested action steps based on the magnitude of the emergency event, for example, contrasting the World Trade Center attacks with earthquake aftershocks [23].

Ethnic and Residence Differences

The studies presented did conduct research with multiple races, but did not report differences between groups.

Summary Findings

Common findings. Consistent with the literature, the PMDP found that the public audience will seek detailed information about what to do to protect themselves and their loved ones in the event of a terrorist attack. The PMDP findings were consistent also in terms of the details needed by the public: namely, the nature of the threat, steps to minimize risk of exposure, and treatment of infection. The findings are also consistent in terms of the need to detail how precautionary action steps depend on proximity or other circumstances of the event. The PMDP findings were consistent with large RDD surveys as well as with similar focus group research such as that carried out it Rhode Island.

Many of the American studies review looked at information needed by the public during the anthrax attacks and the 2001 World Trade Center attacks. The PMDP findings, which emerged from a protocol using a hypothetical terrorist attack, confirm and are validated by the results of the earlier quantitative studies. The PMDP results also confirm those of the similar focus group study conducted in Rhode Island.

Different findings. The PMDP findings did contradict the published literature in the following areas: according to the PMDP focus groups, being given all relevant details in the event of a terrorism attack was important, whereas those interviewed in the New York street study felt overwhelmed by all of the information. Those participants in the PMDP were asked about knowledge needs in the event of a terrorism attack, while those in the New York street study were asked about pre-event information. The public may feel a greater need for information during rather than they may feel they need prior to an event.

The existing literature and the PMDP also show different, complementary results. The PMDP did not ask about a topic discussed in other research: knowledge regarding emergency preparedness plans.

PMDP contributions. In contrast with the published literature, the PMDP focus groups was able to document that information needs are consistent across different regions, and for ethnic groups and place of residence. The PMDP also allowed researchers to gather qualitative in-depth information on the needs of the public; the quantitative research studies asked participants to select from a predetermined list.

Implications. The general public will look for detailed information about: the nature of the threat, action steps to keep themselves and loved ones safe, and how the government is responding. Information needs are consistent across different parts of the country and for different audience groups. However, specific action steps will depend on the proximity and other circumstances specific to the threat. Likelihood of exposure will determine the mix of recommended actions for prevention and treatment.

Information seeking in the event of hypothetical attack using plague

PMDP Findings

Participants said they would use television first and radio second for immediate information about how to protect themselves in the event of a terrorist attack. In addition, participants said they would contact local agencies: law enforcement, emergency response, and medical authorities. Urban participants said they would use the media first, while rural participants said they would call local authorities first. Over time they would turn to newspapers and the Internet for more in-depth information. They will compare different sources (i.e., different media channels and the Internet) to assess the validity and accuracy of information. Where participants are during an event will determine what they look to first.

Quantitative Analysis

Two national sample surveys in the U.S., a 2001 Columbia University Opinion Poll and the Stempel Newspaper Study, asked respondents about their use of, and the role of the media, during the 2001 World Trade Center attacks [24, 25]. The Columbia University Opinion Poll did not provide much information on methodology or number of participants, however with the Stempel Newspaper study the 1,131 respondents were randomly selected and contacted by telephone. In both studies 90% of respondents said television was the most useful source. The Columbia University Opinion Poll [25] found that cable news had the largest television audience (45%),

followed by network television, then local television. Other media discussed in the Stempel Newspaper Study included newspaper (67%), radio (68%), and the Internet (37%) [24].

Evidence from the French study [19], showed that radio usage increased from 66% to 82% after exposure to emergency instruction materials. Researchers at the University of Mexico interviewed 127 people about the diffusion of information in the media after the September 11th terrorist attacks [26]. Participants surveyed after actual emergency events, such as the explosion at a plant in France and the World Trade Centers attacks in the US, turned to television, radio, or person-to-person communication for their emergency information [19, 26].

The Stempel Newspaper Study [24] reported age differences in information seeking behavior; newspaper use was substantially less in ages 18-34 than other age groups. Such differences in media usage based on age may affect successful message dissemination. According to a meta-analysis of 20 studies [27] performed by Duggan and Banwell, effective dissemination of messages is contingent upon three main factors: (1) willingness to accept knowledge, (2) targeting information to a specific audience, and (3) role of opinion leaders. The general recommendations of the study authors were that dissemination methods should match the target audience, and leaders should be identified for each target audience and be used as a resource. Matching the leader and media source for each target audience should lead to increased effectiveness.

Some survey research, including the Blendon Anthrax Study [28], (with 1009 participants from a national random digit dial survey and 1529 participants from areas affected by the anthrax attacks) reported that Americans would rely on interpersonal sources, importantly, their own physician, for advice in the event of a major outbreak of a disease [28, 29]. One survey (N=209), a 2000 mailed survey to ambulatory patients in primary care clinics in Boston, reported that 86% of respondents would turn to the computer for information in the event of an attack; health websites were trusted more than general media websites. Survey respondents were mostly white and middle-aged patients. The study authors noted that until Internet access becomes more broadly available, its use will not benefit disadvantaged populations [29].

Qualitative Results

The Rhode Island focus group study found that newspapers and television are important sources of information in the event of an attack [22]. The Rift Valley Fever Study, a small study in a semi-rural community simulated an intentional release of Rift Valley Virus and asked participants to respond to both open and closed-ended questions [15]. The authors reported that study participants indicated that they would be satisfied if they only received federal government information, but would prefer a variety of sources: federal government, local health officials, and non-government officials. Participants also wanted local and federal authorities to be present in their community giving information, rather than at a remote location [15].

Interviews done with 300 Pennsylvania participants living various distance from a rabies outbreak in the early 1950's reported that sources of information included newspapers and conversations with others [30]. The closer the threat, the greater number of sources people turn to for information about the threat.

Ethnic and Residence Differences

None of the studies included found differences due to ethnicity or place of residence. Participants from different countries looked to the same sources for information.

Summary

Common findings. Across all reported research, and confirmed by the PMDP, research results are consistent: the public will turn first to the broadcast media for information about how to protect themselves in the event of a terrorist event. Several studies also showed that people will seek information from local agencies and interpersonal contacts. Both quantitative and qualitative studies show that television is the primary source that individuals go to when they are seeking information in an emergency. Overall, the PMDP confirmed the same sources of information that other research has found.

The PMDP confirmed findings from the Rhode Island study that found that participants would seek to validate the accuracy of media information by checking multiple sources and channels. The PMDP showed that the public would seek information from local officials, consistent with other research.

Different findings. The PMDP findings contradicted the published literature in two areas. While one national sample survey found that cable network news would be the preferred choice for news and information, the PMDP participants indicated a preference for local affiliate channels. It is likely that this different is due to the topic of interest. In the Columbia University poll the topic was the World Trade Center attacks, which were the focus of national attention especially on September 11th and subsequent days. The PMDP study was concerned with public response to a local attack.

One mail survey reported that the internet was a widely used source, but only for those who have access to it. In contrast, the PMDP found that the internet would likely be a secondary source for information, turned to for further detail and analysis over the course of time by those who had access to it. PMDP researchers purposefully included those in lower socioeconomic classes and those in rural areas in their research, which may reflect the lower use of the internet in the PMDP participants. In addition, the qualitative data in the PMDP study enabled the researchers to specify the nature and sequence of internet use in an emergency, resulting in the contrasting result. The PMDP pre-test results did agree with the internet study in that participants indicated a high level of trust in health websites, naming specifically the website of the CDC.

The existing literature and the PMDP also show different, complementary results. While the PMDP confirmed that members of the public will turn to television first, the data went on to show that radio is a back up source, and a source for people who are traveling by car. This confirms findings from the French study that emphasized radio as a channel for emergency information.

PMDP contributions. The PMDP reported that people living in rural communities will turn to local authorities for information first, and urban communities to the broadcast media first, a distinction not encountered in the literature review.

Implications. The PMDP findings in combination with the existing literature provide powerful corroborating evidence about how and where members of the public will turn to for information in the event of a terrorist emergency. It is clear that the public will look for emergency information from the broadcast media and from local agencies; urban populations will favor the former, and rural populations the latter. Urban or rural, local media and official sources will be important in the event of an outbreak in a specific community. People will compare different information sources as a way of validating the accuracy of the information they are getting, so it is important that different sources be consistent in what they say. Over time, people will turn to the internet and print media for more detailed news and analysis about a specific event.

Public actions in the event of a hypothetical attack using plague

PMDP Findings

PMDP participants' first actions were seeking information, contacting family to see if they were alright, and looking for food, shelter and water, along the lines of preparing for more familiar types of weather emergencies or natural disasters. They said they would seek information from medical professionals and other authorities. Participants also gave contradictory views on their intentions to travel: some said they would shelter in place, while others said they would flee the area.

Quantitative Analysis

The literature search found a number of relevant articles based on random digit dial telephone interviews [9-13, 28, 31-35], opinion polls carried out by major research organizations or major newspapers [31, 36-38], electronic surveys[14] and closed ended interviews [15, 39-42]. These surveys asked participants what they were doing to protect themselves from anthrax [28]; SARS[10-12, 14], cholera [41]; and September 11th type terrorism attacks [31, 38, 42]. Studies found that in regards to infectious disease, good hygiene (washing hands and keeping the home clean) was the most mentioned method for preventing illness [10-12, 41]. Other means of preventing illness from an attack or epidemic mentioned included: stockpiling food and water [10, 28], staying away from others who may have been exposed or who are sick [14], seeking information from the internet or physicians [10, 12], and avoiding public places [10, 12]. The Blendon Anthrax Study [28] found that many people did take certain precautions such as using disinfectants and being cautious when opening mail to prevent illness and transmission. Survey participants looked for additional information from the internet or healthcare professionals, stockpiled supplies, and bought protective masks during the SARS outbreak [9-12].

For the most part, many participants in these studies knew the plausible precautionary measures but very few members of the general public were actually taking measures to protect themselves [11, 12, 31, 38] at the time of the research.

A number of studies examined the individual behavior of Americans in general or New Yorkers specifically after the September 11th terrorist attacks [31, 32, 34-37, 39, 43] and the Oklahoma City bombing [40]. These studies looked at long-term behaviors and found increases in alcohol and drug use among those effected [32, 43]; increases in donation to charity and volunteering [32, 35]; and those affected turning to religion [32, 33]. More immediate actions taken by the public after September 11th included: avoiding public places [32], avoiding skyscrapers and subways [36, 37], avoiding flying, and

big money expenditures [34]. Seeking psychological help was also a behavior of some directly affected by the terrorist attacks [39, 40].

A number of studies looked at the public's adherence to public heath directives. The Blendon SARS Study and the Rift Valley Fever Study found that most would comply with isolation and/or quarantine if directed by public health officials during a SARS outbreak [12] or a Rift Valley Fever outbreak [15]. Seventy-five percent of people polled would get the smallpox vaccination in the case of a smallpox outbreak [13]. In the event of a terrorist attack like September 11,th the Boscarino Fear of Terrorism Study found only 47% of participants would have waited for directions to evacuate before taking action and those with the most fear were more likely to flee, even if fleeing would cause more problems than staying in one place [31]. The Boscarino Fear of Terrorism Study included 1,001 New Yorkers contacted by phone through a random-digit dial method.

The India Plague Study [16] found those in India understood that basic personal hygiene could prevent illness, however there was a lack of understanding about preventive community measures.

Qualitative Findings:
No qualitative research was found on the topic.

Ethnic or region differences
For the most part the relevant studies did not report on racial or ethnic differences. The only racial difference came from the Torabi Study of religiosity after September 11th showing that African Americans were more likely to turn to religion after the event than non-African Americans; the study was carried out in 2002 with 807 US adults randomly selected for telephone interviews [33]. Many studies also did not look at differences between rural and urban participants.

The actions of the public may be more related to direct contact or fear of direct contact with the disease or attack. Blendon 2003 and Blendon SARS study found that those most directly affected by an outbreak or a terrorist attack were more likely to take preventive actions [9, 10]. In the Blendon Anthrax Study [28], those directly effected were statistically more likely to take precautions when opening mail and more likely to look for additional information on precautionary measures [28]; this was also the case for those surveys performed in the New York City area research, such as the Boscarino Fear of Terrorism Study [31] and a 2004 New York Times Survey [38] of 806 general public and small business owners, that focused on the September 11th attacks.

Summary
Common findings. The PMDP findings confirmed the extant literature in the following areas: the PMDP showed that members of the public will take various actions in response to a terrorist attack. While not all of the actions are consistent with government directives, they make sense to the study participants, depending on their circumstances. For example, study participants report that they will look for information from health care providers, stockpile food and water, and take

precautions to prevent infection, such as fleeing from the scene. PMDP findings are consistent with and are validated by those immediate behaviors that were found in other research conducted during real rather than hypothetical events. The PMDP findings are consistent on the whole with those of the quantitative and qualitative studies reviewed.

Different findings. The PMDP findings did not contradict the published literature. The existing literature and the PMDP show different, complementary results, however. The PMDP research didn't look into more long-term changes in behavior such as increased alcohol use or delaying travel plans or big money expenditures. The PMDP also did not look at differences between those who were directly affected and those who were in the vicinity of the attack. The scenarios used in the PMDP did not include research participants becoming infected with the disease or knowing anyone that was infected with plague.

PMDP contributions. The PMDP allowed for in-depth discussion of actions people would take, and the motives behind those behaviors. This information was currently not available in most quantitative studies that only allow for the participants to select from a list of offered answers. On the whole however, the actions taken were consistent across the different studies and the PMDP.

Implications. The public will take a variety of actions in the event of a terrorism attack or an outbreak of an infectious disease, and not all of those actions will have positive consequences for the public. Public health professionals and other emergency responders will need to provide the public with information on preventive actions that the public may take to protect themselves, and provide background information that explains why those actions need to be taken and how taking the action will protect the public.

Emotional and psychological responses to a hypothetical attack

PMDP Findings:
The PMDP participants reported that they were scared, worried and angry in response to the hypothetical terrorist attack, regardless of ethnicity, education or socioeconomic status; often their fear increased as the scenario was rolled out. Participants residing in areas with a greater level of perceived risk (e.g. nursing home, living near a military base) felt they had nowhere to go in the event of an attack, resulting in heightened emotional states. Young participants were more likely to be nonchalant and feel that they would easily survive a plague attack.

Quantitative Analysis
Relevant studies found in the review asked respondents about their emotional and psychological response to terrorism acts in general [43], the September 11th terrorist attacks [32, 44, 45], the Oklahoma City bombing [46], and ongoing terrorism acts in Isreal [47]. A number of these studies were focused on the long-term effects of a terrorism event. The 2004 Rand Study [43], a literature and internet information review found that long-term psychological and emotional problems resulting from the terrorist attacks including posttraumatic stress disorder, anxiety disorders, depression, and substance abuse.

Surveys were given to 88 sixth graders, in schools located in towns 100 miles away from Oklahoma City after the Oklahoma City bombings. The survey found that children felt confused, fear and shock, with younger children feeling the most confused.

Qualitative Analysis
One particular study looked particularly at ethnocultural variables, carrying out interviews with university students, civic leaders, church leaders, and the general public. The multiple-choice questions and free-format questions were answered by 224 Americans living in the Southeast. Participants immediately felt shock and disbelief at the acts of terrorism that took place on September 11th [44].

Ethnic or Regional Differences When looking at long-term psychological effects of terrorism, some studies found higher long-term distress in women [32, 45, 47] and minority groups [32]. In the short term ethnocultural study, adult surveyed showed that women were more likely to feel more emotional distress after a terrorism attack, and those younger adults were more likely to report feeling fearful [44].

Summary
Common findings. The PMDP findings were consistent with previous research that asked about immediate emotional response to terrorist events that showed that people reacted with fear, shock and disbelief.

Different findings. The PMDP findings contradicted the published literature in one area. The PMDP data showed that those who were younger tended to be less fearful or distressed, in contrast with the findings of a September 11th study that found that those who were younger adults were more likely to be fearful [44]. One explanation for the difference could be related to the realism of the scenario. Those involved in the PMDP were told before the focus groups began that events where "made up and not happening" responses to a real terrorism event could be entirely different. The PMDP also included a small sample of younger adults, and those included may not have been representative of the population as a whole.

PMDP contributions. Unlike the other studies, the PMDP research looked at specific groups such as those living in close proximity to a military base or those in residential living facilities. These populations, especially those living in residential care facilities, face important obstacles beyond those living independently.

Implications. In the event of a terrorist attack the public is likely to be frightened, confused, or in shock. It is important that emergency responders understand the psychological state that the public is in when communicating during an event. Communication should include needed information, be reassuring when possible, and provide action steps for people to take, especially for those in the vicinity of the threat.

Confidence in government

PMDP Findings

PMDP participants had a general lack of trust in the government. Levels of confidence were less for federal government than local authorities (with the exception of the CDC). Minority groups appeared to be especially suspicious of the government. Many participants indicated that full disclosure of information and openness on the part of the government officials in an emergency would build trust. Perceived preparedness emerged in the research as a construct that affected confidence in government. Many participants felt there was a lack of resources for treatment and that the local public health system would not be able to respond adequately to an emergency situation. This led to decreased confidence in government to cope with emergencies. Civil servants were more trusted than local elected officials.

Quantitative Findings

A number of random digit dial surveys of Americans, including the 2004 Columbia University Study [20], found that the general public didn't trust that the government was prepared for a terrorist attack (percentage of those confident ranged from 37% to 53%) [20, 48, 49]. While confidence in government increased immediately after the September 11th attacks [35, 50], trends showed that confidence declined over time [51-53]. (Interestingly, a survey of 1222 US city mayors suggests that they agree, finding that many of them felt that their community was not prepared to detect a bioterrorism threat, equip emergency response personnel, or communicate with the public or emergency persons [54].) The Marist Institute for Public Opinion, carried out an opinion poll with 2588 Americans throughout the country in 2003, and found that many Americans felt that the government could not protect America's water supply, airports/transportation, and nuclear power plants [55]. However, some studies, such as the Blendon Anthrax Study, found that local physicians are trusted by more than 50% the public as are local public health agencies [28].

A 2003 New York Times opinion poll with 976 New Yorkers found that participants felt the government was unprepared for biological or chemical attacks [36]. However, in a 2004 follow-up survey confidence in local New York firefighters and police remained high (76% and 67%) among New Yorkers [56]. Not surprisingly, there were some differences between New York City and the rest of the country. A University of Michigan Civil Liberties Survey, a national random-digit-dialing telephone survey (N= 1448), found that New Yorkers had lower levels of confidence in the actions of President Bush then Americans did as a whole [57].

A number of studies asked the public directly who they would trust in the event of another terrorist attack, with contradictory results. While some national studies found that local health and fire officials were very trustworthy [15, 17, 56], other studies found that the CDC was the most trusted source and local health officials were less trusted. Other trusted federal organizations were: the Department of Health and Human Services [9, 15], the Surgeon General [9, 15, 55], Homeland Security [9, 15] and President Bush [15, 55].

Qualitative FindingsThe Rhode Island focus group study assessed public information needs before, during and after a bioterrorism emergency [22], and found that most participants were concerned about the state's preparedness and many believed the state was not prepared to adequately respond to bioterrorism emergencies. However, they did have faith in the state government to plan and respond appropriately.

Ethnic and area differences

Some studies have found evidence that authorities who communicated openly, shared information as soon as they received it and were honest about new information, had more success in getting the public to practice preventative measures. For example the Singapore SARS Study [11], showed that those who thought authorities were open to communication were more inclined to practice six or more prevention measures than those who felt they had no chance to express their feelings. Greater than 80% felt official information was accurate. During the SARS epidemic in Singapore, confidence in government was higher then the confidence found among Americans related to September 11th, anthrax, and other terrorism and infectious disease issues.

The Los Angeles County Department of Health Services carried out a survey with 8167 Los Angeles adults to gauge the perceptions of the public in regards to emergency responders acting fairly in the event of a bioterrorism attack. Most people (72.7%) included in a the survey said they felt that the government would react fairly in the event of a bioterrorist attack. However African Americans (especially younger ones) and Spanish speaking Latinos thought the government would not treat all races the same [58].

Summary

Common findings. Qualitative and quantitative studies in the published literature were consistent with PMDP findings that members of the public believe that their communities are not prepared for a terrorist emergency, and this perception negatively affects confidence in government's ability to respond in an emergency. At the same time, the PMDP research was consistent with one study that showed that openness and community integration are important for creating trust. The lack of trust and confidence was often, but not always, directed toward federal officials in both these studies and the PMDP research.

As in the PMDP, the Los Angeles study found racial differences when looking at government response to an attack. African Americans and Hispanics were more likely to distrust officials and fear unequal treatment of minority groups during a bioterrorism attack.

Different findings. The PMDP findings contradicted the published literature in one area. The studies included reported a variety of different government officials and agencies as trusted. While the PMDP also found a variety of government officials and organizations trusted, local organizations were most trusted. This was not always true for the quantitative survey findings, where some found the most trusted organizations were federal government officials such as the President and the Surgeon General. Those differences could possibly stem from the wordings of the questions or the answer categories available in the closed ended survey questions.

The existing literature and the PMDP show different, complementary results, however. Other studies reviewed assessed phenomena the PMDP did not address, including changes in confidence or trust over time, and confidence levels of specific populations, such as New Yorkers.

PMDP contributions. The PMDP literature adds to the existing literature in useful ways. The PMDP was able to delve into reasons behind lack of confidence or distrust because of the

qualitative nature of the research. A more in depth look at trust and confidence was not possible when using close-ended opinion polls and RDD surveys. Learning from past outbreak experiences can inform us of issues related to public confidence. Past experiences can also play a role in perceptions of preparedness and trust as well. If past experiences were not handled well, that memory may serve as a template for future experiences. Some participants in the PMDP studies noted past experiences as a basis for their lack of trust in the government. Others noted examples that served as positive examples (e.g. Mayor Guiliani and the September 11 attacks). PMPD participants also indicated that they were more likely to trust local officials and emergency responders, especially if a local terrorist attack were to take place in their community.

Implications. Consistent with past research, the PMDP study found that members of the public believe that their communities are ill-prepared for emergencies, and it seems likely that this negatively affects their trust in government response. The PMDP study confirms prior research suggesting that the more open officials are about their efforts, the more the public will trust and cooperate with public health directives. Similarly, local officials and emergency responders should disclose efforts to improve preparedness. It is also important that many levels of government be involved in the emergency response activities.

Perceptions of media materials

PMDP Findings

In the first year of the PMDP study, focus group participants were asked about their perceptions of the media as well as about existing CDC plague fact sheets. Most participants commented positively about the timeliness and accuracy of news reports. At the same time, a few participants across focus groups questioned the motives of the media as trying to build audiences, and consequently having a tendency to "hype" events. Participants' perceptions of the media were influenced by the credibility of the source of information, the clarity and openness on the part of the government. Minority participants were especially skeptical of the media.

The Year 2 focus groups and interviews pre-tested message materials developed by the PMDP teams, including radio and TV messages and fact sheets. Participants preferred clear, consistent, and specific information from a credible source. Identifying the source of the information was a way to increase credibility; CDC was identified as a credible source. They insisted that sources should be honest and forthcoming about details of the event in order to gain the publics' trust.

Quantitative Analysis

In the 2002 Columbia University study [25], 85% of respondents rated coverage of the World Trade Center attacks as excellent or good because it was timely, comprehensive and informative. Few, if any, faulted it for being biased, too negative or too sensational. Two and a half weeks after the attack 63% of respondents felt the amount of coverage was appropriate. The Stempel Newspaper Study asked about the usefulness of media sources and how exposure to it made them feel [24]. Ninety-one percent said TV was the most useful source, 67% said newspaper, 68% also mentioned radio and 37% said the Internet. Age was not a factor, but, newspaper use by 18-34 age groups was substantially less than other age groups. The Blendon Anthrax Study [28] found that public anxiety, reinforced by extensive media coverage, did not lead study participants to overestimate their risk and create heavy demands on the health care system.

A national panel survey carried out between October 2001 and September 2003 concerning TV use and trust in government was conducted in three waves after the World Trade Center attacks [53]. Overall, TV news use, not newspaper use, was associated with higher levels of trust in government and confidence in institutions during the surge of coverage after September 2001. Results showed that use of television news was positively associated with trust in government and confidence in government institutions for one year after the initial survey, however the positive impact faded over time. Those who reported watching TV news for their primary source of information were more likely to have lower levels of social trust a year later. No effects were found for newspaper use, and declines in trust were not seen by any particular media source overall. After a year, neither form of media shaped trust. The authors suggest change in content as reasons. Over time, the perception of the media may change due to a number of factors. The importance of media during and immediately following an event appear to be especially important in gaining the public's trust and confidence.

Qualitative Analysis
No qualitative research was found on the topic.

Ethnic or region differences
Relevant studies did not discuss ethnic or regional differences.

Summary
Common findings. Overall, perceptions of the media appear to be fairly positive in the case of an actual emergency event. Like the quantitative studies, the PMDP found that timely information that was not too negative or too sensational was responded to positively by the public. Also like the relevant studies, the PMDP participants felt that the media was a useful and important source of information.

Different findings.. One study found age to be an important predictor of media use; the PMDP study did not stratify by age.

PMDP contributions. Relevant studies in the literature did not stratify by race and place of residence as the PMDP study did. The PMDP studies found that minority participants were more suspicious and less trusting of the media. The PMDP study was consistent with the findings from the existing literature showing overall confidence in news coverage. The PMDP focus groups however discerned an undercurrent of concern regarding the motives of the media; minority groups in the PMDP were more vocal about their skepticism of media coverage.

In addition, the PMDP study found valuable public evaluation and recommendations for message materials, in sum, participants wanted action steps at the top of beginning of each communication, action steps and other information to be clear and understandable, and additional resource. While other studies did look at message materials, for the most part those studies only reported psychological responses to the materials or missing information. These studies were included in earlier sections of the report. However, the PMPD's findings that precautionary information is reassuring for members of the public may be consistent with the initial effect found in the three wave study of an increase in trust for watchers of news programs. It is

important to point out that news programs about emergencies do not necessarily include recommendations for what people need to do.

Implications. The news media play an important role in releasing information about an on-going event, and steps the public can take to stay safe. Including clear and accurate precautionary steps is important to reassure the public and provide actions residents can take. Some research also suggest that the news media can have an effect on the public's trust in government's ability to handle situations in the immediate aftermath of an emergency. Varied media use by different audience segments indicates that the media strategy must be broad-based.

Emotional and psychological response to media materials

PMDP Findings

The PMDP study asked participants about their emotional response to message materials (radio, television, and print) about plague. Participants indicated that when information was incomplete, lacked credibility, and included uncertainty, their distress in response to an outbreak could be heightened. However, when the media provided adequate information participants felt more informed and less anxious.

Quantitative Analysis

A number of studies have examined responses to the World Trade Center attacks and their emotional and psychological impact. Such studies provide evidence that a terrorist attack can lead to emotional and psychological trauma and that media coverage can play a role in ameliorating or exacerbating the impact of the event.

Four quantitative studies were found that looked at emotional and/or psychological responses to media exposure. In the Stempel Newspaper Study , respondents were asked about their reactions to the World Trade Center attacks and use of media and the role media played [24]. Participants were asked about the usefulness of media sources and how exposure to it made them feel. Of those who said the Internet was the best source (37%) of information, 51% said media coverage made them feel worse. Only 16 % said it made them feel better able to cope. Internet users were also more likely to feel less safe in comparison to those who cited newspapers and TV as the best source of information.

A paper and pencil questionnaire study was taken by 218 students at a Midwestern university six months after September 2001 to see if there was a relationship between exposure to stories related to the World Trade Center attacks and a fear of being a victim and concern for personal safety [59]. Overall TV exposure did not significantly correlate with the social attitudes associated with fear but did approach significance as a predictor of reduced sense of safety and faith in others. Overall, results showed that viewer differences are more important than sheer exposure for explaining media effects.

In an experimental study researchers measured anxiety of middle-class Americans before and after being exposed to a video including terrorism related news clips [60]. The experimental group was exposed to a 12-minute film that had archive material of news clippings depicting terrorist threats to the country, while the control group had only relevant news clips that did not contain

materials depicting terrorism threat. Media exposure to terrorist related footage increased state anxiety levels compared to control group. Women reported more anxiety than men. Religious participants reported more anxiety than secular participants (there were no gender differences within religion). There was also an interaction between dogmatism and religion (secular/high dogmatism more anxious after viewing terror related footage, religious/high dogmatism less anxious after viewing terror related footage). An interaction between gender and dogmatism was found such that men/high dogmatism reported greater anxiety whereas women/low dogmatism reported greater anxiety.

Television viewing behavior was linked to symptoms of Post-Traumatic Stress Disorder (PTSD) in a random digit dial telephone survey conducted with 2,001 New Yorkers four months after September 11th [61]. Results indicated that people who viewed more TV images in the seven days after the attack had more probable PTSD. People in the highest third of viewing had a 2.32 times greater odds of probable PTSD compared to those in the lowest third. Other factors that contributed to the association between TV viewing and probable PTSD were adjusted for (such as previous exposure to traumatic life events, having a relative killed) and the association between TV viewing and PTSD symptoms remained, suggesting that these are inter-related and independent of other factors. Results indicate that in general, the more TV viewing that occurred, the more PTSD symptoms surfaced.

Qualitative Analysis

No qualitative research was found on the topic.

Ethnic and Location Differences

Earlier studies mentioned that there were gender differences when it came to emotional and psychological responses to terrorism coverage in the media [60]; however none of the studies looked at ethnic differences or looked at responses in different locations.

Summary

Common findings. The PMDP findings were consistent with those of prior studies in suggesting that exposure to media coverage about an event can contribute to increased fear. PMDP participants said that radio and television segments caused greater fear and anxiety. The PMDP found that provision of actionable information could help to calm the public however.

Different findings. PMDP pre-tested information specifically designed to inform the public about what to do in the event of a plague outbreak. The studies included in the verification analysis looked at viewing of news coverage about a real or hypothetical event, without a specific focus on emergency response information. The other studies did not find that additional information could lessen anxiety as the PMDP did. In our assessment, it was the additional emergency response information included in message materials that reassured focus group participants; it appears that news coverage in and of itself can not be relied on to provide this needed information. For example, in the randomized study which found that anxiety was heightened by exposure to film clips about terrorism, participants were only shown one news clip and no additional information was provided to participants, so there was no opportunity to test reduction of anxiety when given additional emergency response messages.

The existing literature and the PMDP show different, complementary results, however. The PMDP analysis was not able to evaluate the effect of individual differences that the quantitative studies did; individual characteristics afford powerful analytical explanations for how people respond to events.

PMDP contributions. The PMDP literature adds to the existing literature in useful ways. While some of the studies did look at differences among media, most did not offer the three channels (radio, TV, and print) as sources of information. In addition, in evaluating emergency response messages rather than news coverage, we found that increased actionable messages proved to be reassuring to audience members.

Implications. The PMDP findings are consistent with the existing literature in showing that news coverage and information about emergencies can have emotional and psychological effects on audience members. However, our research also shows that actionable messages can be reassuring for the public. It is important that those responsible for providing messages to the public include accurate information about steps people can take to keep themselves and their families safe. Providing adequate and correct information may help to alleviate the stress felt by the public.

IV. Discussion

The comparison of the PMDP research findings with findings from extant literature on similar relevant topics overall shows a remarkable concordance in many important areas. Contradictions are rare and comparatively inconsequential. More common are differences due to contrasting survey questions or analyses. Importantly, the review of the available literature shows that the PMDP has made some important new and unique contributions to the field, the result typically of the comparisons by ethnicity and place of residence that were integral to the study design.

The PMDP confirmed existing research regarding the importance of providing the public with clear, adequate and timely information in the event of a bioterrorism attack or an outbreak of a highly contagious infectious disease. According to the findings from both the PMDP and many of the articles reviewed, in the event of an outbreak the general public will look for information about: the nature of the threat, how the infectious disease is transmitted, diagnosed, and prevented; where and when to go for medical assistance; and what steps the government is taking to respond to the attack. Many respondents wanted specific instructions stating what actions they could take to keep themselves and their loved ones safe.

Research also highlighted the importance of broadcasting public health from a trusted source. The PMDP found that many of the participants felt that government officials, especially federal government authorities may not provide honest and credible information. Like the PMDP many of the verification analysis studies found that the public is variable in which institutions it is most likely to trust. Including local, state, health and federal officials in the information dissemination may help reach a larger audience, and increase the credibility of the messages. The PMDP contrasted with previous research in finding more trust for local than federal authorities when it comes to emergency response.

A clear finding across the review and the PMDP was that the vast majority of people would turn to media sources in the event of a crisis, primarily television and radio sources. The findings also show that many people would look to multiple sources to validate and verify the information they receive. Including different government agencies and multiple media sources in the communication effort will increase the reach and credibility of the information. An important and unique contribution of the PMDP analysis was the finding that rural audiences will seek information from local authorities first.

An important implication from these findings is that these sources are going to be judged based on their accuracy and consistency. Gaining the public's trust by being open and honest is important. Certain studies also found that media coverage and information may actually cause the public to become more frightened. It seems that this outcome may be a response to information quality however. When the public receives information that is incomplete or confusing, the information may leave the public feeling even more anxious and concerned, while providing complete and clear information may help to ease fears.

Many of the studies reviewed in the verification analysis surveyed people about their reactions to real events – the World Trade Center attacks, for example – and in this way serve to substantiate the PMDP findings. Many also measured long-term consequences and reactions to actual events, which is crucial to understanding the importance of immediate response to crisis. Successful immediate response may be a factor in how people cope long term. While the PMDP did not look at the long-term effects of a terrorist attack, findings from our research may bear on the long-term effects of emergencies. Preparation of resources, including psychological care may help people cope and may also foster trust that authorities and local responders not only care about their physical well being, but also their emotional and psychological well-being. Immediate response and well-constructed messages can help people cope with the situation. PMDP findings on immediate responses found what would be expected, much as the verification analysis did, that people were shocked, frightened, and anxious. Verification analysis research as well as the PMDP focus group research found that the public may take a variety of actions in the event of a disease outbreak or terrorist attack. Both sources found that in general people will seek additional information about how to keep themselves, their families, and loved ones safe. While anxiety and shock are normal in a crisis situation, our research suggests that information about action steps affords a sense of control in a seemingly powerless situation. Providing people with a sense of control that they can do something concrete to help themselves may help them deal with the crippling emotions often experienced at a time of crisis.

In contrast with the PMDP findings, few of the studies in the verification analysis looked at differences among ethnic groups or location. The quantitative studies, which were predominant in this analysis, used random sampling methods which would have diluted any one ethnic group's or regional group's tendencies. In exchange, these studies gave us a representative sample of a broader cross-section of the population and how they viewed the topic of interest. These national sample surveys validate the PMDP findings in many important instances. In addition, the studies point to characteristics that inform effective message dissemination. For example, individuals who had been previously affected by an event were more likely to take preventive actions. Age, gender and ethnicity were also found to be associated with media use in the verification analysis findings; the PMDP also found ethnicity to be an important part in

message processes. Consistent with best practices in public health communication, these findings show that audience characteristics are important to consider when developing and disseminating messages.

In sum, the findings of the PMDP analysis confirm and extend the qualitative and quantitative findings reviewed in this verification analysis. The literature identifies the need for information, the sources of information that are most sought out by the public, the characteristics of trusted sources, the emotional, psychological, and behavioral responses that result from exposure to events, and the characteristics and perceptions of the public that influence their response to messages. The PMDP extended previous research through the development of message materials based on focus group feedback and further testing of these materials on specific groups. The PMDP showed that certain populations in our society, such as rural groups and minorities are skeptical of government authorities (especially federal officials) and are not confident that resources will be disseminated to their populations equally. The results of the PMDP allowed for a detailed account of how various rural and urban groups and various ethic groups reacted to pre-event message materials.

The fact that the responses from these focus groups were congruent with the findings from other qualitative and quantitative studies in the verification analysis provides powerful convergent validity to these findings. One of the primary lessons from this analysis is that bioterrorist threat and action has long-term implications. The quality of early interventions and preparations and immediate response to an event will most likely have an effect on long-term responses.

V. Practical Implications

- The public in the PMDP and the verification studies reported a need for specific information about what action steps to take in the event of an attack. This information should be provided to the public in clear language and a timely manner.

- Information provided to the public needs to be perceived as open, honest, comprehensive, and simple to understand. When asking the public to take a specific action, government officials and emergency responders need to provide rationales and explanations for recommended actions, and the likely outcomes of the actions.

- The public trusted a number of different sources of information; for many the federal government was the least trusted source. Including many levels of government, emergency response agencies, the local media, and medical professionals in the communication process can help to encourage the public to respond appropriately to the disaster at hand.

- The public indicated that the main source of information would be media sources, specifically television. Emergency professionals need to have open lines of communication with the media in order to get all of the crucial information out to the media as early as possible. Emergency response officials should start to cultivate these relationships before emergencies happen.

- Many studies indicate that members of the public will look to multiple sources to verify information. Information being provided across different media and from official agencies and organizations needs to be consistent. Mixed messages are likely to lead to reduced levels of adherence to directives.

- Emotional and psychological responses to real or hypothetical events were similar, many stating anxiety, shock, and fear. Messages and communication directed to the general public should take this into consideration. Actionable messages with advice on how to keep loved ones safe may provide members of the public a sense of control and reassure them in the face of uncertainty.

- Message and dissemination strategies need to be developed with audience characteristics in mind. Results of both the PMDP and the verification studies found that characteristics such as age, race, location, and previous exposure to events may moderate response to messages.

- Communities should provide information about emergency response preparations to the public. Knowing that steps are being taken may help the public feel more confident in emergency preparedness and may help increase public trust.

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Appendix A: Interview guides for year one and year two

Year One Interview Guide

INTRODUCTION (3 min.)

- Hi, my name is _____and I work for SLU.
- Thank you for helping us.

- We're developing informational materials regarding possible emergency situations.
- We've asked you to come here today to think about these situations and look at some of our materials.

- Before we begin, I'd like to introduce our project team. (Introduce team members by name). They are going to take notes during our discussion today.

Ricardo		Heather		Bruce		Betsy	
Cheryl	Mary		Terri			Kris	
Keri		Christina		Suzy			Alan
Laura	LaBraunna						
		Angela					

Informed consent (5 min.)

- Before we look at the materials, I'd like to review something with you. *(Nonverbal notetaker will distribute the informed consent document.)*
- This document explains the purpose of the discussion group and what you can expect while you're here.
- Let's go over the key points.
- First, I want you to know that your participation today is voluntary and you don't have to answer any question that makes you feel uncomfortable. You may leave at any time without penalty.
- Second, our discussion today will be audio taped. This will allow us to pay close attention to your comments and make our notes more accurate. Your name will not be identified in any of our transcripts and only our project team will have access to those transcripts.
- And finally, you will receive $20 cash after our discussion, which will last no more than 2 hours.
- Possible benefits of participating in our discussion include:
  - Becoming better informed about bioterrorism and what to do in the event of an attack;
  - Experiencing increased confidence in your ability to make an informed decision about a possible bioterrorism attack; and
  - Having the opportunity to discuss your fears and concerns about a bioterrorism attack.
- Possible risks of participating in our discussion include:
  - Feeling distress or anxiety by discussing the possibility of a bioterrorism attack.

Please take a minute to fill out the demographic form. We're not asking for your name, answering is voluntary, can refuse to answer any questions and still participate in the discussion group.

- Does anyone have questions? **We're going to start recording now**. *(Nonverbal notetaker will start the audiotape recording.)*

Guidelines (5 min.)

- Please try to talk one at a time.
- We're very interested in your opinions. There are no right or wrong answers, only different ideas. So please be honest and share what you think. I didn't create these materials so please don't worry about hurting my feelings!
- During our discussion, you may think of a lot of questions that you have about bioterrorism. We'd like you to write them down.
- We won't be able to answer your questions during the discussion, in part because the reason we're here is to see whether *the materials* answer all your questions.

- If we answer questions during the discussion this could affect your response to the materials you'll review later.
- I'm going to warn you, you're going to feel frustrated when we don't answer your questions right away.
- At the end of our discussion, a bioterrorism expert from the SLU Center for the Study of Bioterrorism will be available to answer any remaining questions you have.
- Also at this time please turn off cell phones and pagers if you are able to do so.
- We will also give you some information sheets to take with you.
- Are there any more questions before we begin?

(NOTE TO MODERATOR: If participants ask questions during the discussion, say:

"We can't answer your question now as it may influence the results of the discussion. Please write down your questions and a bioterrorism expert will be available at the end of the discussion to answer them.")

Icebreaker/introductions (5 min.)

- Let's go around the room and please introduce yourself by saying your first name only [and title, department, etc.] and telling us your favorite restaurant in St. Louis.
- Ok, now let's begin our discussion.

GENERAL QUESTIONS (10 minutes)

Pre-Event Knowledge, Attitudes and Responses:

- Recently there has been news about potential terrorist threats, and President Bush has instituted a color alert system for terrorist attacks.

Questions:

- Has anyone heard of the color alert system?

  Prompts (if needed)

  - What do the different colors mean?
  - What else does the system tell you?
  - How many different colors are there?
- What are the kinds of things you can do to protect yourself from a terrorist attack?

  Prompts (if needed)

  - Where do you find information about protecting yourself?
- There are different kinds of terrorist threats. What is a *chemical* threat?
- What is a *radiological* threat?
- What is a *biological* threat?

Prompts (if needed)
- How can it be transmitted?

SCENARIO ROLLOUT (45 minutes)

- For the remainder of the focus group, please note that we'll be talking only about biological threats.
- Now, I am going to walk you through a made up story about what might happen if a biological weapon were used right here in St. Louis.
- There are four parts to the story. After each part, we'll talk about your reactions and thoughts.
- I will read the story out loud.
- Please remember that what I'm telling you is made up. This is not happening now, and we hope it will never happen.

Scenario, part 1: Non-Specific Agent

Read this verbatim:

You wake up about 7 am on a Tuesday and turn on the local news to hear that President Bush has raised the Homeland Security Advisory System threat level to severe (red). The president and his advisors report that this change in the national threat level is based on knowledge of a credible threat that a terrorist group may be planning a biological attack in St. Louis. Officials suspect that the attack may involve a biological weapon.

Questions:

- Tell me how you would feel about this news?
- What would you want to know?
  - Would you want to know what the agent was?
- What would you do?
- Where would you go to get more information?
  - Why would you turn to these sources?
  - Who do you think is the best source of information in the event of an attack?

Scenario, part 2: Symptoms

Read this verbatim:

A week later, early on a Monday afternoon, you turn on the radio and hear that 15 people in St. Louis have presented at local emergency rooms and doctors' offices with fever, headache, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and bloody saliva. Although the cause has not been confirmed, these symptoms are consistent with plague. Plague is a disease that can infect the lungs and may spread from person to person through the air.

Questions:

- *Now* how do you feel about this news?
- What would you want to know?
  - Would you want to know what else, besides plague, this could be?
- *Now* what would you do?
  - Why would you action now?
  - Why did you not do action before?
- *Now* where would you go to get more information?
  - Why would you turn to these sources now?
  - Who do you think is the best source of information in the event of an attack?
  - Would you find that some sources are more reliable at this stage than others? Why?

Scenario, part 3: Specific Agent + Symptoms + Response

Read this verbatim:

Later that same day, you turn on your TV to find that a local government official has issued a statement. She confirms that there has been a deliberate release of a biological agent in St. Louis and the agent has been confirmed to be the one that causes plague. It was believed to have been released at a shopping mall, into the air. So far, there are 30 presumed cases, however more persons in St. Louis are potentially infected. Local health workers and emergency personnel are working to contain the problem by shutting down the mall, figuring out who was there, and calling for the potentially infected to seek medical treatment.

Questions:

- Tell me how you would feel about this.
  - Is your feeling different than the way you felt before? How? Why?
- What would you want to know?
  - Would you want to know that there was enough medicine available?
- What would you do now?
  - If you were NOT exposed, would you still go to the doctor for treatment?
  - Why would you do action now?
  - Why did you not do action before?
- Where would you go to get more information now?
  - Why would you turn to these sources now?
  - Who do you think is the best source of information in the event of an attack?

BT information seeking behavior

Questions:

- How confident are you that there are systems in place that will respond in a way that keeps you safe?

- How confident are you that your elected state and local government officials will respond in a way that keeps you safe?
- What could the medical and emergency responders do to make you feel more secure?
- If you were the mayor of your city or town, what would you tell people in the event of an attack?

FACT SHEET PRETESTING STAGE

Scenario, part 4: Release of information

Read this verbatim:

Local officials release information with recommendations for steps you can take to protect yourself from plague.

- Now we're going to show you some materials of the sort that might be released should such an attack like this ever happen.
- Please give us your honest thoughts, feelings and responses to these materials. Again, please keep in mind that there are no right or wrong answers; we are just looking for your reactions. *(Instruct participants to remove plague fact sheets from their folders.)* They are titled "Questions and Answers about Plague" and "Plague Fact Sheet."
- Take about 10 minutes to look at the materials, and feel free to write down other questions, comments, and concerns about the materials.
- When you're finished, please turn over the papers just to indicate that you're done reading. Do you have any questions?

Comprehension:

- What do you think are the main points of these fact sheets?
- After reading these fact sheets what questions do you have about plague?
- What parts of the fact sheets were unclear or difficult to understand?
  - Were there any parts of the fact sheets you had to read twice, or that didn't make sense to you the first time you read them?
- Based on this message, what action would you take in the event of a plague outbreak?
- Is there any other information you would want to know that isn't included in the fact sheets?
  - How is this agent spread?
  - How is a case of plague confirmed?
  - What would you do to protect your family?
  - What would you do if you think you are infected?

Emotional response

- How do these fact sheets make you feel?
  - What about these fact sheets makes you *emotional response*?
  - How could we change these fact sheets to make them less/ more *emotional response?*

Credibility:

- How credible is the information in the fact sheets?
  - Why? Or what makes you say that?
- What, if anything, would make this information more credible?
- Is there anything here that you think is not being disclosed?

Self-Efficacy, Response Efficacy and Behavioral Intent:

- How confident are you that the actions recommended in the fact sheets will keep you safe?
  - Why or why not?
- How confident are you that you can carry out these recommendations?
  - Why or why not?
- Which, if any, of the recommendations do you intend to follow?

Recommendations for Improvement

- Do you have any other recommendations to make these fact sheets better or more useful to you?

CONCLUSION (15 min.)

- Now I'd like to introduce our bioterrorism expert, Bruce Clements/ Terri Rebmann/ Suzy Walker. S/He will answer your remaining questions. *(Bioterrorism expert will answer questions.)*

- Thank you for joining us today.
- We really appreciate you taking the time to meet with us.
- Please leave the pre-test materials, but you can take the rest of the folder with you.
- You can leave at any time but don't forget to see (Nonverbal notetaker) to receive your $20.

(IF ANYONE REQUESTS THE PRETEST MATERIALS, SAY: "The materials we are currently testing still need to be finalized and approved before they will be available for release.")

Year Two Interview Guide

INTRODUCTION (3 min.)

- Hi, my name is _____and I work for SLU.
- Thank you for helping us.
- Before we begin, I'd like to introduce our project team. (Introduce team members by name). They are going to take notes during our discussion today.

Pre-Screening

- Before we get started, I would like to discuss a few minimal risks or potential stressors that may occur during our discussion. During this focus group, we will be discussing potential terrorist threats, attacks, and hypothetical exposure to chemical or biological agents. Due to the sensitivity of this subject, participants who have experienced violent acts, had family or friends experience violent acts or have had any other experience that may lead to higher sensitivity to the topic may want to reconsider participating in this focus group. Please keep in mind that the nature of this discussion may be upsetting especially if you are particularly sensitive to this subject matter.

- **You are free to leave at any time during the discussion.**

- **You will be compensated for your time regardless of your participation in this group.**

- Please consider what I have read and excuse yourself if you have experienced or currently experience any of the issues presented and you think that these issues will make you particularly sensitive to discussing the following topic areas, potential terrorist attacks, bioterrorism, and diseases that may occur as a result of exposure.

Informed consent (5 min.)

- Before we look at the materials, I'd like to review something with you. *(Nonverbal notetaker will distribute the informed consent document.)*
- This document explains the purpose of the discussion group and what you can expect while you're here.
- Let's go over the key points.
- First, I want you to know that your participation today is voluntary and you don't have to answer any question that makes you feel uncomfortable. You may leave at any time without penalty.
- Second, our discussion today will be audio taped. This will allow us to pay close attention to your comments and make our notes more accurate. Your name will not be identified in any of our transcripts and only our project team will have access to those transcripts.

- And finally, you will receive $20 cash after our discussion, which will last no more than 2 hours.
- Possible benefits of participating in our discussion include:
  - Being better informed about bioterrorism threats.
  - Having increased confidence in your ability to make an informed decision about bioterrorist threats
  - Having the opportunity to discuss your fears and concerns
- Possible risks of participating in our discussion include:
  - Feeling distress or anxiety by discussing the possibility of a bioterrorism attack

Please take a minute to fill out the demographic form. We're not asking for your name, answering is voluntary, and you can refuse to answer any questions and still participate in the discussion group.

- Does anyone have questions? We're going to start recording now. *(Nonverbal notetaker will start the audiotape recording.)*

Guidelines (5 min.)

- Please try to talk one at a time.
- We're very interested in your opinions. There are no right or wrong answers, only different ideas. So please be honest and share what you think.
- During our discussion, you may think of a lot of questions that you have about plague. We'd like you to write them down.
- We won't be able to answer your questions during the discussion, in part because the reason we're here is to see whether the materials answer all your questions.
- If we answer questions during the discussion this could affect your response to the materials you'll review later. At the end of our discussion, a plague expert from the SLU Center for the Study of Bioterrorism will be available to answer any remaining questions you have.
- Also at this time please turn off cell phones and pagers if you are able to do so.
- We will also give you some information to take with you.
- Are there any more questions before we begin?

(NOTE TO MODERATOR: If participants ask questions during the discussion, say: "We can't answer your question now as it may influence the results of the discussion. Please write down your questions and a plague expert will be available at the end of the discussion to answer them.")

Icebreaker/introductions (7 min.)

- Let's go around the room and please introduce yourself by saying your first name only [and title, department, etc.] and sharing one of your favorite hobbies.

- **SCENARIO ROLLOUT and Materials Testing**

- We have asked you here today to walk you through a made up story about what might happen if a {biological} weapon were used right here in {St. Louis}.
- There are three parts to the story. After each part, we'll talk about your reactions and thoughts.
- I will read the story out loud.
- Please remember that what I'm telling you is made up. This is not happening now, and we hope it will never happen.

Part One: Non-Specific Agent & Symptoms

You wake up about 7 am on a Tuesday and turn on the local news to hear that President Bush has raised the Homeland Security Advisory System threat level to severe (red). The president and his advisors report that this change in the national threat level is based on knowledge of a credible threat that a terrorist group may be planning an attack in {St. Louis}. Officials suspect that the attack may involve a biological weapon.

A week later, early on a Monday afternoon, you turn on the radio and hear that 15 people in {St. Louis} have presented at local emergency rooms and doctors' offices with symptoms resembling pneumonic plague. As you listen to the radio further, you hear the following clips:

[Play radio Slip]

(After radio clip)

- Now I'd like to ask you some questions about the radio.

Comprehension:

- What were the 2 or 3 most important points in the clips?

- What information in the clip was new to you?

- What parts of the messages were clear? What parts of the clip were unclear?
- What parts were difficult to understand? What didn't make sense when you heard it the first time? (It seems like we could maybe get rid of one of these questions)

- What questions do you still have?
  Prompts (if needed): About the nature of the threat, about symptoms of plague illness, etc.

Emotional Response:

- How does this clip make you feel?
  Prompts (if needed):
  Repeat for each emotion mentioned
  - What about the clip makes you feel _(emotion)?
  - How could we change the clip to make it less/ more _(emotion)_ ?

Actions

- How confident are you that the actions recommended in the clip will keep you safe? (Efficacy)
  - PROBE (if needed): Why or why not?

- How confident are you that you can carry out the recommendations in these clips? (efficacy)
  - PROBE (if needed): Why or why not?

- Which of the recommendations do you intend to follow? Which recommendations do you not intent to follow? (intention)

Channel Appropriateness

- Is this the kind of information you would like to get from the radio?

- What additional information would you want to hear on the radio? (is this covered in what questions do you still have?)

- What might be a better medium to get this information to you?

- Where else would you look for additional information?
  (This questions could be a probe for the previous question)
  - Why would you look to these other places?

Response to the materials

- What was your overall impression of the clip? (overall impression.)

- What grabbed your attention? (appeal)
  - What did you like?
  - What didn't you like?

- How believable is the information in the clip? (credibility)
  - How believable is the spokesperson in the clips?

- Given these events what information was useful to you? (relevance)

- Do you have <u>any recommendations</u> to make this clip better or more useful to you?

<u>Part Two- Specific Agent + Symptoms + Response</u>

Later that same day, you turn on your TV to find that a local government official has issued a statement. She confirms that there has been a deliberate release of a biological agent in {St. Louis} and the agent has been confirmed to be the one that causes plague. It was believed to have been released at a shopping mall, into the air. So far, there are 30 presumed cases, however more people in {St. Louis} are potentially infected. Local health workers and emergency personnel are working to contain the problem by shutting down the mall, figuring out who was there, and calling for the potentially infected to seek medical treatment. After the local officials announcement you see the following television clip:

(Play TV slip)

(After TV clip)

- Now I'd like to ask you some questions <u>about the TV clip only</u>.

Comprehension:

- What were the 2 or 3 most important points in the clip?
- What information in the clip was <u>new</u> to you?
- What parts of the messages were clear? What parts of the clip were unclear?
- What parts were difficult to understand? What didn't make sense the first time you saw or heard it?
- What questions do you still have?
  Prompts (if needed): About the nature of the threat, about symptoms of plague, etc.

Emotional Response:

- How does this clip make you feel?
  Prompts (if needed):
  Repeat for each emotion mentioned
  - What about the clip makes you feel <u>(emotion)</u>?
  - How could we change the clip to make it less/ more <u>(emotion)</u>?

Actions

- How confident are you that the actions recommended in the clip will keep you safe? (Efficacy)
    - PROBE (if needed): Why or why not?

- How confident are you that you can carry out the recommendations in the clip? (efficacy)
    - PROBE (if needed): Why or why not?

- Which of the recommendations do you intend to follow? What recommendations do you not intent to follow? (intention)

Channel Appropriateness

- Is this the kind of information you would like to get from the TV?

- What additional information would you want to see on the TV?

- What might be a better medium to get this information to you?

- Where else would you look for additional information?
    - Why would you look to these other places?

Response to the materials

- What was your overall impression of the clip? (overall impression.)

- What grabbed your attention? (appeal)
    - What did you like?
    - What didn't you like?

- How believable is the information in the clip? (credibility)
    - How believable are the people in the clip?

- Given these events what information was useful to you? (relevance)

- Do you have <u>any recommendations</u> to make this clip better or more useful to you?

<u>Part Three- Release of Print Information</u>

After the initial reports, local officials release information with recommendations for steps you can take to protect yourself from plague. These materials will be available on the Internet as well as printed copies at local organizations.

Instruct participants to remove plague fact sheet from their folders.) Take about 10 minutes to look at the fact sheet, and feel free to write down questions, comments, and concerns. When

you're finished, please turn over the paper just to indicate that you're done reading. Do you have any questions?

Please give us your honest thoughts, feelings and responses to this fact sheet. Again, please keep in mind that there are no right or wrong answers; we are just looking for your reactions.

- Now I'd like to ask you some questions about the fact sheets

Comprehension:

- What were the 2 or 3 most important points in the fact sheet?
- What information in the fact sheet was new to you?
- What parts of the fact sheets were clear? What parts of the fact sheets were unclear?
- What parts were difficult to understand? What didn't make sense the first time you read it it?
- What questions do you still have?
  Prompts (if needed): About the nature of the threat, about symptoms of plague, etc.

Emotional Response:

- How does this fact sheet make you feel?
  Prompts (if needed):
  Repeat for each emotion mentioned
  - What about the fact sheet makes you feel _(emotion)?
  - How could we change the fact sheet to make it less/ more _(emotion)_?

Actions

- How confident are you that the actions recommended in the fact sheet will keep you safe? (Efficacy)
  - PROBE (if needed): Why or why not?
- How confident are you that you can carry out the recommendations in the fact sheets? (Efficacy)
  - PROBE (if needed): Why or why not?
- Which of the recommendations do you intend to follow? Which recommendations do you not intent to follow? (Intention)

Channel Appropriateness

- Is this the kind of information you would like to get from the internet or other places where you may pick up fact sheets?

- What additional information would you want to read in the fact sheet?

- What might be a better medium to get this information to you?

- Where else would you look for additional information?
    - Why would you look to these other places?

Response to the materials

- What was your overall impression of the fact sheet? (Overall impression.)

- What grabbed your attention? (Appeal)
    - What did you like?
    - What didn't you like?

- How believable is the information in the fact sheets? (Credibility)

- Given these events what information was useful to you? (Relevance)

- Do you have <u>any recommendations</u> to make this fact sheet better or more useful to you?
-

<u>Part Four</u>

Now thinking about all three media presented- radio, TV, and print.

Preferred channels for terrorism information dissemination:

- Did you find the information from the radio, television, or print more helpful? Why or why not?
- What sources would you have most likely turned to during the described crisis?
    - *Where would you turn to first?*
    - *Would you go to another form of media after the first*?

CONCLUSION (15 min.)

- Now I'd like to introduce our plague expert, Bruce Clements/ Terri Rebmann/ Suzy Walker. S/He will answer your remaining questions. *(Plague expert will answer questions while nonverbal notetaker distributes counseling resources plague resources, and plague info.)*

- Thank you for joining us today.
- We really appreciate you taking the time to meet with us.
- Please <u>leave the plague fact sheet</u>, but you can take the rest of the folder with you.
- You can leave at any time but don't forget to see <u>(Nonverbal notetaker)</u> to receive your $20.

(IF ANYONE REQUESTS THE PRETEST MATERIALS, SAY: “The materials we are currently testing still need to be finalized and approved before they will be available for release.”)

Appendix B: Search Terms

1. Survey or opinion or public opinion or perception or public perception or focus group or message or review or meta or scope or literature or interview or meta-analysis or literature review or verification or verification analysis or qualitative analysis or qualitative

and

2. disaster warning or emergency or emergency warning or emergency message or information need or emergency response or ems or disaster communication or emergency communication or risk communication or crisis communication or communication or community information need or response to government or government response

and

3. Disaster or Terror or bioterror or terrorism or bioterrrorism or mass casualty or mass trauma or emergency prep or first response or contamination or biowar or weapons of mass destruction or WMD

and

4. Plague or Antibiotics or infectious disease or SARS or Contagion or antidote or smallpox or anthrax or contagious or spread or biological or bacteria or outbreak

Appendix C Selection Criteria- Second Round (Abstracts and Articles)

When looking through the abstracts for article received during the search using recommended terms. The following should be considered when deciding which articles inclusion.

1. Articles must contain data. Do not include thought pieces, commentary, or editorials. Do include meta-analysis, case studies, scientific studies, or opinion surveys.

2. Articles must be in English

3. Articles must be related to Bioterrorism and/or disasters and/or outbreak of infectious disease.

   Example of article that should not be included:
   Harve H. Silfvast T. The use of automated external defibrillators by non-medical first responders in Finland. European Journal of Emergency Medicine. 11(3):130-3, 2004 Jun.

4. Articles should be about communication with the general public, not epidemiology or medical provision.

   Example of article that should not be included:
   Barthell EN. Aronsky D. Cochrane DG. Cable G. Stair T. Frontlines Work Group. The Frontlines of Medicine Project progress report: standardized communicatio of emergency department triage data for syndromic surveillance. Annals of Emergency Medicine. 44(3):247-52, 2004 Sep

5. Article regarding response should be referring to general public, and not preparedness, official responses, medical responses, or medical facility responses (with the exception of communication responses). Articles about the training of hospital and first responders should also not be included.

   Example of articles that should not be included:
   Kim-Farley RJ. Celentano JT. Gunter C. Jones JW. Stone RA. Aller RD. Mascola L. Grigsby SF. Fielding JE. Standardized emergency management system and response to a smallpox emergency. Prehospital & Disaster Medicine. 18(4):313-20, 2003 Oct-Dec.

   Example of article that should be included:
   Prue CE. Lackey C. Swenarski L. Gantt JM. Communication monitoring: shaping CDC's emergency risk communication efforts. Journal of Health Communication. 8 Suppl 1:35-49; discussion 148-51, 2003.

6. Articles including discussion of public perception of government response to a bioterrorism attack, disaster, and or infectious disease outbreak should be included.
   Example of article that should be included:

Becker C. 20/20 hindsight. Months after anthrax claimed the lives of several. Americans, hospitals review their reaction to the event--and plan for future crises. Modern Healthcare. 32(8):8-9, 12, 2002 Feb 25

7. Articles about public beliefs, reactions, perceptions, or knowledge of government and non-government organizations preparedness should be included.

8. Articles which focus on medical treatment, disease physiology, or highly technical research should not be included.

   Example of article that should not be included:
   Singh N. Belen O. Leger MM. Campos JM. Cluster of Trichosporon mucoides in children associated with a faulty bronchoscope. Pediatric Infectious Disease Journal. 22(7):609-12, 2003 Jul

9. Articles discussion mental effects of terrorism and/or disasters on the general pubic.

   Example of article that should be included:
   DiGiovanni C Jr. The spectrum of human reactions to terrorist attacks with weapons of mass destruction: early management considerations. [Journal Article] Prehospital & Disaster Medicine. 18(3):253-7, 2003 Jul-Sep.

Priority Settings

A: Infectious Disease and Terrorism
B: Infectious Disease non-terrorism
C: Terrorism non-infectious agents
D: Disasters non-terrorism and non-infectious Disease

Appendix D: Article Review Database Structure

Verification Analysis Review Variables: Because of the current use of the Filemaker pro database, it is easy to add additional fields to cover the review of the included articles. The review can be a mixture of open-ended information as well as the use of checkboxes (More then one opinion can be chosen)

Article Sections- Checkbox List
-Literature review/background/Theoretical context
-Methodology
-Study Demographics
-Results
-Discussion/Conclusions
-Implications

Demographics

Population- Checkbox List
American
Non-American
Group Level
Non-human population
-Text Box to describe non-human population

Age- Checkbox List
-Adults (non-specific): 18 and up (Non listed at University Students and labeled elderly)
-Children and Adolescents: < 18
-University Students
-Elderly: > 60 or labeled as elderly

Patient Status – Checkbox List
-Patient
-Non-patient

Number of Subjects _____

Response Rates _____

Overview of Demographics – Open ended that can include information on race, income, gender, educational level if available.

Methodology

Quantitative Methods - Checkbox
-Opinion Poll (in person or over phone)
-Mailed closed ended survey

-Telephone closed ended survey
-Random Digit-Dial Telephone closed ended survey
-Electronic closed ended survey
-Media Content Analysis
-Meta-analysis
-Longitudinal Study
-Other

Qualitative Methods – Checkbox List
-Focus Groups
-Structured in-person interviews
-Indepth Interviews
-Key Informant Interviews
-Observation
-Case Study
-Other

Other Methodology_____

Method Overview: Brief narrative in regards to methodology which can include more information on method used, information on recruitment, or measurement

Study

Study Variables – Checkboxes
Public Perception/Knowledge
-Estimation of own risk
-Concern for others (family and friends)
-Agent knowledge
-Information belief
-Confidence/Trust in government/systems
Communication
-Information Needs
-Message content
-Perception of Media coverage
-Exposure to media/Media coverage
Behavior/Actions
-Precautionary measures
-Reaction Behaviors
-Information Seeking
-Exposure to traumatic Events
-Experience
Mental/Emotional
-Emotional Response
-Psychological response

-**Other Variables**_____

Summary Of findings- Narrative description of the findings and implications from the research using the study variables as headings.

PEMD Project Relation

Year 1- Checkbox List
-Pre-event knowledge (understanding of CAS, preventive measures, and agents)
-Response to Scenario (Information seeking, emotional and behavioral response)
-Confidence in Government
-Response to Print materials (Credibility, readability, usefulness)

Year 2- Checkbox List
-Media consumption/preference
-Response to print, radio, and television materials.

Research Quality Assessment (Nelson, DE; et al. Communicating public health information Effectively: A guide for practitioners. American Public Health Association: Washington, DC. 2002)

Published in peer review journal: Yes/No
Reproduces findings from other studies: Yes/No
Uses human subjects: Yes/No
Reports on results related to tested hypothesis: Yes/No
Limitations mentioned: Yes/No
Relationship to previous studies discusses: Yes/No