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Bioterrorism and Local Agency Preparedness: Results from an Experimental Study in Risk Communication

DOI 10.1515/jhsem-2014-0107

Abstract: This article examines data collected from a panel of 43 local, state, and Federal emergency response professionals and public officials in Pueblo, Colorado who participated in a 6-month risk communication experiment simulating the remediation of simultaneous bioterrorist attacks involving anthrax and Foot and Mouth Disease. Participant responses to the scenario presented in real-time indicated that local and state government agency personnel with responsibility for public health emergency management are not necessarily familiar with best practices developed from major incidents. Findings also indicate that information related to bioterrorism response should be provided to agencies that do not normally work in public health but that would be involved in responding to a biological agent event.

Keywords: bioterrorism; experiment; local agency; preparedness; public health; risk communications.

1 Introduction

Preparedness is typically determined by an agency's ability to meet benchmarks set based on the best available information about the resources that were required in past emergencies or that are expected to be needed for potential future crises. However, best practices in public health emergency management promoted by Federal agencies working in the homeland security field may not always or very effectively be disseminated to local government agencies. In particular, agencies that do not typically view themselves as working in the homeland security field will likely not be conversant in best practices and discipline standard approaches to containing and responding to threats.

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This article examines the responses of a panel of public health emergency response professionals and public officials in Pueblo, Colorado to a 6-month-long scenario presenting risk communications during the initial response and remediation phases of a simulated major bioterrorist attack. The results indicate significant differences in response readiness across different agencies, and suggest that not all state and local agencies are prepared to implement best practices recommended by their Federal counterparts, or to accept responsibility for all phases of response and mitigation. In particular, in different city and county agencies responsible for emergency public health provision in the same jurisdiction, basic familiarity with both disease control and public risk communications varied markedly, indicating challenges to interoperability capacity and a need to expand dissemination of best practices.

The results are also notable because they reflect the views of a semi-rural small city in southern Colorado in an area with a relatively high percentage of persons belonging to one or more vulnerable population categories with regard to emergency preparedness and response capability. While other studies examine the implementation of best practice guidelines in metropolitan areas surrounding major government, higher education, and population centers, the findings from Pueblo strongly indicate that best practices, particularly in the area of risk communications, guidelines can benefit from approaches that take into account regional ideological and cultural differences.

2 Reservation of Authority and Reservations about Authority

Under the US Federal system, “state and local governments are generally responsible for all phases of disaster management” because authority is reserved to states unless otherwise specified (Col 2007: p. 115). Local emergency services act as initial frontline responders, and state public health agencies have emergency powers to contain communicable disease (FEMA 2002: p. 32). This is often not understood, even by state and local officials. While homeland security and resilience concerns are established elements of the responsibility of public health agencies, such concerns are non-routine and are considered the jurisdiction of external experts from national offices. While many state and local agencies hold emergency preparedness drills, in many cases their response capacity for non-routine public health emergencies goes unevaluated (Henstra 2010: pp. 236–246). For example, recent studies have indicated that local agency staff have limited knowledge, training or confidence in containing an anthrax event (Galada et al. 2013: pp. 631–660).

Previous studies have indicated a general relative lack of preparedness for hypothetical biological attacks, and difficulty in related risk communications. While numerous agencies have held bioterrorism exercises, bioterrorism is not among the most familiar disaster scenarios to most public health experts, public servants, or members of the general public (Raber et al. 2011: p. 271). Despite decades of such threats, bioterrorism is “seen as new and exotic by the general public” because of unfamiliarity with symptoms, uncertainty over the possible source of contamination, and difficulty in detecting or apprehending the perpetrator (Reynolds and Seeger 2005: pp. 44–45).

One means of evaluating preparedness for bioterrorism is through experimental studies. Federal officials and emergency response personnel have been subjects of decision-making exercises and studies involving simulated bioterrorist incidents, most notably the Dark Winter exercise in Denver in 2001. However, Hafner-Burton et al. (2013: p. 368) note that expert participation in experimental studies remains rare because professionals are frequently too busy doing their jobs and may be reluctant to state their views for fear of being quoted accurately or inaccurately in the media or questioned by their superiors in the bureaucratic hierarchy. However, it is important to include experts in experiments because their decision-making processes and policy preferences differ from other experimental subjects, and this is particularly vital in public health emergency management (Caplan et al. 2013: pp. 775–776; Hafner-Burton et al. 2013: p. 368).

For this reason, we included a panel of experts from primarily local and state government in our experimental study on emergency public health risk communications. Experts are defined in this context as individuals with considerable influence in their domains. Studies of decision-making predict that experts have different decision-making skills than the average citizen because their relative career and educational success and experience levels cause them to “tend to be less averse to loss” (Hafner-Burton et al. 2013: pp. 369–371).

3 Risk Communications Study Design

We designed an experimental study in which different groups of participants received reports about the progress of the remediation of a domestic bioterrorist attack to measure attitudes toward risk messaging during decontamination, and how views might change over an extended period of time. We created a scenario taking place in Pueblo of the near-simultaneous release of anthrax spores in a recreation area that is also the regional water supply, and also foot and mouth disease (FMD) virus at the annual State Fair in the heart of the city. The scenario presented

to participants took place in real-time and described events beginning with four reported deaths from anthrax and spores subsequently discovered in city water pipes, and discovery of the highly transmissible FMD virus, which does not affect humans, in local cattle, potentially devastating the region's economy.

We invited 60 officials representing a number of Federal, state, and local agencies with responsibility for emergency management across Colorado to participate.¹ Forty-three volunteer participants agreed to participate, including representatives of the offices of a US senator, the lieutenant governor, a chamber leader in the state legislature, the Centers for Disease Control, the state departments of agriculture, health, and the attorney general, county boards of health, fire departments, municipal government and water works, and local school districts.

Participants read 17 typically biweekly simulated newspaper or television news website articles describing containment and remediation efforts over a 6 month period. This timeframe both mirrored the cleanup of the 2001 anthrax attacks from incident to final reoccupation of contaminated space (Daschle and D'Orso 2003), and also permitted a longitudinal study of participant attitudes.

All participants requested that they receive communications by email as the best approximation for how they would receive updates during a real emergency. They were asked to write open-ended responses describing their reactions to the information presented and their understanding of the various risk levels at that point. We also requested that they describe what they and their agency would do under the circumstances depicted. Some participants responded by roleplaying, providing highly detailed accounts and even mock press releases. Response rates dropped significantly after the first month. Only about half of the participants replied to all messages, and the average response rate to any given message ranged from one quarter to half of the participants.

4 Study Findings

Our hypothesis was that government-employed experts in public health emergency management would accept official risk communications messaging based on empirically determined probabilities of risk. Instead, we found most local and state government officials who participated in this study expressed unfamiliarity with agents and precautions related to bioterrorism containment, demanded the most extensive available decontamination treatments even when they were

¹ This study received human subject ethics clearance from the Institutional Review Board of Colorado State University-Pueblo.

described as providing only marginally reduced risk despite maximal disruption to affected communities, and expressed cynicism about the information presented to them by Federal government partners.

The contaminants and the decontamination chemicals were largely unfamiliar to respondents in both panels, and it did not appear that most participants had the knowledge or interest to weigh probabilities of contamination or determination of levels of risk.

4.1 Jurisdictional Differences Impact Readiness

Perhaps the most notable finding is the evidence that emergency management personnel should not be assumed to be uniformly prepared to respond to all aspects of a significant bioterrorist attack or an emergent infectious disease like Ebola. While perhaps homeland security planners at the Federal and state levels are conversant in lessons learned from major terrorist attacks over the past two decades, evidently not all personnel across every relevant state and local agency are.

Feedback session responses that were particularly surprising from participants who had just completed a 6-month-long bioterrorism simulation included “What’s FMD?,” “What’s Cipro?,” and the succinct “I don’t know what most of this means.” While one participant insisted that the scenario did not go beyond the scale of anything that her local governmental agency had actually encountered previously, another stated “Some of this stuff went over my head when I was reading it and if I was scared, I’d be like I don’t want to read this. I would lose a great deal of understanding of some of that stuff.” Others said, perhaps jokingly, that they would prefer to switch to another career than deal with events described in the scenario. In other cases, discussions turned to lengthy explorations of parochial concerns over how staffing patterns and comp time would be addressed given the overtime requirements that the scenario would create.

Therefore, while representatives of local and state government agencies expressed the view during their feedback sessions that they bear the responsibility of representing community needs to Federal remediation and investigation agencies, it is not clear that they are as prepared to implement the recommendations of Federal agencies in their communities. This is not to say that they are ineffective at their jobs, but rather that the “lessons” of Amerithrax and other terrorist attacks may not have been disseminated as widely as those involved in homeland security policymaking at the national level might presume.²

² Amerithrax was the code-name the FBI gave to its 2001–2008 investigation of the anthrax mailings of fall 2001.

In fact, there was a clear presumption by participants that they would be sidelined by Federal officials regardless of jurisdictional authority (e.g. “the CDC would take over and say ‘you’re gone’”). There appeared to be a readiness on the part of local officials to acquiesce to state or federal “experts” based on some idea that they are “higher” in the bureaucratic pecking order and that they, therefore, represent greater authority. Some participants expressed openly that they did not understand why certain steps were being taken in decontamination, but that they assumed that Federal agencies knew what they were doing. The assumption that authority will be surrendered may lead local government personnel to forgo engaging with developments in emergency response planning.

Some participants went so far as to express that they would be “scared” by the involvement of Federal agencies, particularly those related to counter-terrorism. Although multiple participants inquired about the (unreported) declaration of a state of emergency in the scenario that could avail them of Federal disaster benefits, it was clear that many were otherwise apprehensive of receiving assistance. One participant said “I don’t think it would be local anymore. I think it would be more ‘you live in this community, but we have people coming from outside our community to really tell us what they’re going to do now,’ and is that something that our community would accept? I think they would because they’d be so afraid.”

However, participants also stated that local agencies must be advocates for their community in such a situation. They argued that, while decisions are being made at the national level, local agencies know the public, are trusted more by the public, and are charged with representing community interests.

Yet it was also clear that there was a lack of interagency understanding of missions and jurisdictions at the local level as well. The focus on clarifying jurisdictional issues in the discussions indicates that there may be an urgent need for state and local emergency response personnel to participate in joint response activities and trainings with other agencies to achieve a more sophisticated and complete appreciation of interagency incident command practice and structure. If this is true in Pueblo, where there have been decades of interagency exercise opportunities related to a potential disaster involving the nearby national chemical weapons stockpile facility, it is almost certainly more true in those communities where there is no such tradition.

4.2 Risk Perceptions among Government Officials

There was little variation between participants in the emergency management sector in terms of their own perceptions of risk and requests for safety measures. All participants supported using the highest levels of chlorination available to

eliminate the threat of *Bacillus anthracis* spores in the water supply, even if it meant effectively shutting down the municipal water system for days by flushing it with swimming pool levels of chlorination to kill 99.99% of bacteria spores. Although initially only two, and later “several,” contaminated pipes are discovered in the metropolitan water system, and even though health officials state that “the concentration of spores detected is unlikely to produce illness in humans,” no respondents indicated support for leaving the water supply untreated. Only one participant favored increasing chlorination to the degree that it would kill 97 percent of spores while keeping the water potable throughout, but shifted to maximum superchlorination when the following communication described angry public demonstrations in favor of the strongest available remediation.

The clear preference among respondents was for efforts to reduce residual risk to zero, even if the consequences of that risk reduction effort were described as extremely disruptive such as making the city water supply unfit for any use for a week. Although the scenario noted that the water supply was considered to be acceptably safe, one public health officer stated that she “would be boiling my water just to be safe with the spores;” another rejoined “‘Remain calm and the public is not at risk.’ Yeah right!” And a third public safety official stated that even the maximum superchlorination available that would be expected to kill 99.99% of spores would not be fully reassuring “because I do not want to be the one who gets anthrax from the 0.1% that was not killed in the water.”

In remediating FMD contamination, participants faced what was essentially an economic threat and a voluntary risk. With the site quarantined and no direct threats to human health, the only imperative to act quickly in the scenario came from the local business community and from national agribusiness interests, both of which argued for the need to rebuild confidence as quickly as possible.

Participants, however, reacted negatively to pressures to remediate and reopen the fairgrounds as quickly as possible, describing them as “selfish” or motivated by economic self-interest. For both biological agents, whether they had lethal effects on humans or no direct effects at all, emergency response and governmental professionals clearly preferred a zero-risk standard after decontamination, regardless of costs or inconveniences.

4.3 Emotive Response

Study participant responses indicate the importance of services to ensure the mental and emotional health of response officials in extended public health crises, particularly that they, like the public, require empowering information. The scenario itself appears to have produced negative affect among some

participants. We had not anticipated that emergency management officials would find participation depressing. However, that is what many respondents reported. (e.g. “Every time one of these emails came – and I was a little further down.”) When information was presented in the scenario that presented difficulties with remediation, delays in implementation, description of economic inconveniences, or uncertainty about policy courses, participants responded with more criticism of the exercise itself or expressed more negative statements about government or business. When information was presented that described clean-up efforts as proceeding, participants typically offered more positive evaluations of the exercise and government generally.

Respondents informed us that they found even this fictional scenario to be upsetting because it instilled a sense of uncertainty and powerlessness rather than because they had specific fears about the effects of particular pathogens. Some participants in the debriefing discussion informed us that they had stopped reading because they found the exercise to be depressing, or had come to dread receiving the emails which they characterized as a steady stream of bad news. In follow-up phone interviews conducted 1 year after the exercise, even volunteers who had participated through the entire 6 month scenario recalled few particulars. The greatest lasting impact was a sense of continuing bad news.

Public health and safety professionals expressed negative emotional responses to events depicted in the scenario and described feelings of relief when there were positive news updates provided. Participants informed us that they wanted to feel empowered to respond to the crisis in some way themselves. Consistent with other studies of disaster responses, respondents stated that they wished to be provided with specific action items to do in response to each new situation update (Veil et al. 2011).

One novel finding was that the respondent’s sense of hopefulness or hopelessness about the scenario events produced an emotional response that impacted their evaluations of both the clean-up effort and the exercise itself. Toward the end of the exercise, when a number of participants had been expressing burnout, the depiction of the situation as being brought under control led to more positive responses expressed, particularly during the final month. Some respondents who had interpreted their role as providing a professional critique of the risk communications themselves informed us that messages which depicted problems being resolved were “the best one yet.” Ultimately, providing both local response personnel and the public with some message of reassurance rather than uncertainty, and some cause for optimism, would appear to make people uniformly more receptive to risk messaging and the efforts of responsible agencies.

Another artifact of the responses was that they became more positive in tone as the scenario progressed. While it may be that participants were simply more

comfortable with the exercise over its 6 month course, there appeared to be a noticeable shift in emotive responses. Some participants regularly used feeling words, describing themselves as “alarmed” or “somewhat panicked” when presented with information detailing a new or unanticipated risk in the scenario. The perception that there was “no end in sight” or else that there was “closure” at different stages was present in these responses as well. Other emotive responses indicated general senses of insecurity related to the scenario events, including a self-reported sense of “anxiety” over the economic dislocation described.

Another response was to recommend that authorities “increase security” whenever events in the scenario caused them to feel less optimistic about a successful resolution. These included circumstances such as mechanical difficulties with remediation equipment that would not evidently be aided in any way by a greater law enforcement presence.

Participants who were public sector employees expressed cynicism about the efficacy of government agencies in general during the tabletop discussions, although none expressed a lack of confidence in their own agency.

Although participants who claimed greater familiarity with either anthrax or FMD expressed more confidence in their suggestions for actions, the emotive effects appeared to impact them equally. Based on these results, it would appear beneficial to direct positive messaging to response personnel as well as the public. Information should be accurate, but should also provide cause for some degree of optimism and recommend activities that individuals can undertake that will give them a sense of empowerment. As remediation activities are likely to be extended endeavors both in space and time, maintaining both expert and public support by avoiding fatigue and cynicism from the effects of “bad” news will be key to maintaining confidence in decontamination activities.

4.4 Public Communication Strategies

Participant predictions about public behavior unsurprisingly mirrored their own reactions to the scenario, particularly in risk aversion: As one noted, “even if you tell people that the odds are a million to one against getting sick, they will still want to take extra precautions.” However, some believed that segments of the public would not be responsive to safety warnings at any point, not even boiling drinking water when advised to do so. Several participants argued that it is necessary for public safety professionals to model behavior for the public, and to express confidence in the science behind risk level decisions.

However, some safety measures sparked distrust among participants. Two expressed the view that they believe that posting armed guards at cleanup sites

makes it appear as if the agencies involved are “hiding something.” Similarly, another participant asked generally “In terms of those federal officials, are they demanding the toughest decontamination because the science actually warrants it? Or is it just to gain some political points?” Another stated that what the public perceives to be overkill (remedies they believe to be unnecessary) will cause the public to believe that all decontamination safety protocols are “just for show.”

In terms of answering critical public campaigns or protests, some participants suggested pre-emptive public education campaigns to reduce associated “behavioral health issues.” Others suggested bringing in leaders of protest groups for personal meetings with agency heads to discuss the science behind treatment plans. A minority dissented, with one dismissing potential protests against remediation efforts by suggesting “Ask them what they want to do? Die from anthrax?”

It became clear during the course of our study that not all public safety officers are familiar with recent social media developments, or else do not find them relevant to their job roles. One local agency participant asked Pueblo City-County Health Department (PCCHD) – local health department representatives whether they have a website and whether it is sometimes used for emergency communications. Other participants said that while their agencies use Twitter, it is something that they do not personally understand and instead “leave to” their public affairs staff. We discovered when canvassing potential participants that one reason some volunteers required emails communications was that they were firewalled at work so they could not access social media sites. While this policy was intended to regulate personal use, in effect it meant that emergency messages sent by PCCHD through its Facebook account would be inaccessible to employees of other agencies of the same city. Without a national harmonization of usage regulations, responders must always consider the ability of other agencies to disseminate and receive information online.

4.5 Cultural Factors

A number of respondents also highlighted the unique challenges for Federal and even state agencies in working with rural populations which past studies have indicated are less receptive to what they view as external interventions (Maurer 2009). Individual risk assessments determine support for policies (Stein et al. 2013: p. 319), and so do ideological heuristics (Converse 1964). Additionally, social identity factors such as race and partisan affiliation also influence evaluations of risk level and whether policies are perceived to be effective or not (Nacos et al. 2011: pp. 42, 141, 189–190).

During the 2001 anthrax incident, policymakers and Federal government employees working at the US Capitol reported in interviews diminished levels of

trust in government response when presented with conflicting or unverified information (North et al. 2005). We observed a consistent effect among participants in this study, but more general anti-government attitudes were regularly expressed by state and local government officials. This particular exercise was based in, and the scenario set in, the area surrounding the city of Pueblo, which has a metropolitan population of 130,000 but is far from other population centers. This geographic and social isolation impacts community interactions with Federal agencies every bit as much as do the cultures of some inner-urban neighborhoods, which other studies show are also less likely to trust that governmental responses will benefit them equitably (Meredith et al. 2007). This was more pronounced among representatives of smaller and more remote communities who took part in this study:

Granted, I know out there in the field, there is some difficulty with some people trusting. I mean, it goes back to the attitude, you know, “I’m from the government and I’m here to help you” and people saying “Yeah, there’s the gate, you know, just leave me alone.”

On the positive side, residents of remote and rural areas are more familiar with assisting themselves and each other in emergencies. Most emergency services like fire and medical response are provided by volunteers from the community in rural areas across the country.

5 Recommendations for Preparedness

The data from our study indicates that a dozen years after the major terrorist attacks of 2001, divisions between and within agencies at various levels of government would continue to impede effective public risk communications at the local level. Inter-agency operability and an understanding of significant elements of the bioterrorism threat remain elusive across state and local government agencies that are not concerned with homeland security issues as part of their regular activities. Local officials tend to use readily available information to make sufficient judgments under the assumption that an agency with a higher level of authority or technical expertise will assume responsibility for any cleanup and attendant risk communications.

One common reaction to even basic scientific information is to label it challenging in some diffuse and frightening way – well beyond the receiver’s information comfort zone and capabilities – then to defer judgment and decision-making to someone else. More broadly, scientific/technological illiteracy, in and of itself, threatens our national security given the fact that rational response is founded

on citizens' ability to accept and act on precise instructions immediately or in a short period of time. Increasing levels of cynicism and mistrust also run counter to effective WMD response. This is especially true when the lack of scientific/technical competence can be applied to government officials, spokespersons and decision makers.

The data suggests that it would be helpful to ensure that compilation reports of best practices are actively disseminated to local government agency heads and public information officers. Suggestions about market research and similar detailed planning will only be valuable if they are conducted when there is no looming threat and not once a biological attack has already occurred.

Overall, despite both the increased attention across various levels of government to disaster response capabilities since 9/11, Amerithrax, Hurricane Katrina, and Ebola, in addition to the potential for innovative public risk communications strategies afforded by new media, this study indicates that these changes should not be assumed to be uniformly widespread. Just as any group is only as fast as its slowest member, those who have the responsibility for public safety and communication in emergencies must be prepared to factor these differences in outlook and capabilities into their contingency planning.

Funding: United States Environmental Protection Agency National Homeland Security Research Center, (Grant/Award number: "83498701").

Disclaimers: Although the research described in this article has been funded wholly or in part by the United States Environmental Protection Agency (EPA) through Grant #83498701 to the Pueblo City-County Health Department, it has not been subjected to EPA's required peer and policy review and therefore does not necessarily reflect the views of EPA. Therefore, no official endorsement should be inferred. The opinions expressed in this report are those of the authors and not those of the Federal Bureau of Investigation.

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