Bioterrorism and the People: How to Vaccinate a City against Panic

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Bioterrorism policy discussions and response planning efforts have tended to discount the capacity of the public to participate in the response to an act of bioterrorism, or they have assumed that local populations would impede an effective response. Fears of mass panic and social disorder underlie this bias. Although it is not known how the population will react to an unprecedented act of bioterrorism, experience with natural and technological disasters and disease outbreaks indicates a pattern of generally effective and adaptive collective action. Failure to involve the public as a key partner in the medical and public-health response could hamper effective management of an epidemic and increase the likelihood of social disruption. Ultimately, actions taken by nonprofessional individuals and groups could have the greatest influence on the outcome of a bioterrorism event. Five guidelines for integrating the public into bioterrorism response planning are proposed: (1) treat the public as a capable ally in the response to an epidemic, (2) enlist civic organizations in practical public health activities, (3) anticipate the need for home-based patient care and infection control, (4) invest in public outreach and communication strategies, and (5) ensure that planning reflects the values and priorities of affected populations.

With more sophisticated awareness of the challenges posed by an epidemic caused by an act of biological terrorism (bioterrorism), the definition of a "first responder" to such an event is necessarily evolving. Infectious disease and infection control specialists, emergency department physicians and nurses, public health officials, epidemiologists, laboratorians, and hospital administrators are now seen as the frontline professionals [1]. The current, professionalized model of the response to bioterrorism, however, has largely cast the civilian population as nonparticipants. Rare are the calls to prepare the public to respond in their own right [2, 3]. Likely contributing to the neglect of the public's role in a response to bioterrorism is the assumption that the general public tends to be irrational, uncoordinated, and uncooperative in emergencies—not to mention prone to panic. Such a view, we argue, will lead public health professionals and emergency managers to miss the opportunity to harness the capacities of the civilian population to enhance the effectiveness of a large-scale response.

As demonstrated by community reactions to the terrorist attacks in New York and Washington, D.C., the power of the public to respond effectively to disasters should not be underestimated. In New York, individual volunteers and organized groups converged on the epicenter of destruction to offer aid and support, despite hazardous conditions and uncertainty about the risks of further attack or structural collapse of the World Trade Center towers [4]. Volunteers responded rapidly and in large numbers to help in search and rescue efforts while professional operations were yet to be put in place. Since the attacks, affected communities have been organizing through local government, relief groups, and civic organizations, such as churches, neighborhood associations, and labor organizations.

A catastrophic epidemic caused by a bioterrorist attack could produce similar crisis conditions, although of a wholly different nature that will require the participation of nonprofessionals in the emergency response. Preparedness programs would benefit now from discussions about how to capitalize on the effectiveness and resourcefulness of nonprofessionals, especially

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in the identification, surveillance, and containment of an outbreak, and, potentially, in caring for large numbers of casualties. To that end, we offer 5 guidelines for enhancing the planning for responses to bioterrorism by improving the integration of the lay public (table 1). In the "Conclusion" section, we offer a preliminary assessment of the general public's responses to the currently unfolding anthrax threat, as the responses bear upon the proposed guiding principles.

FIVE GUIDELINES FOR INCLUDING THE PUBLIC IN BIOTERRORISM RESPONSE PLANNING

Recognize that panic is rare and preventable. Discussion of how the general public might respond after a bioterrorist attack typically focuses on the possibility of mass panic, psychological trauma, and social disorder. Creating panic is among the probable goals of those who plan acts of bioterrorism [5]. Expert guides on the health consequences of a bioterrorist attack predominantly focus on negative psychological reactions and aberrant social behaviors [6–8]. Constructive or salutary responses are rarely highlighted. Scenarios for response exercises routinely feature rioting, looting, and vigilantism [9, 10]. There is a widespread belief that panic and civil unrest are likely in the aftermath of a bioterrorist attack, although it is not known how the general population will react to a unprecedented biological attack. However, research on population responses to a wide range of natural and technological disasters suggests that there is a tendency toward adaptability and cooperation and that lawless behavior is infrequent [11–14]. Precipitate, unreasoning fear has been found in such rare circumstances as entrapment in a burning structure from which there is no visible means of escape. A study of the 1918 Spanish influenza pandemic suggests that, in a catastrophic epidemic, the general response of the public is also one of resourcefulness, civility, and mutual aid [15].

The view that panic is the "natural" response of groups in extreme peril ignores the fact that behavioral responses are context sensitive. Collective behavior changes over time and in relation to external events. This suggests that, in times of disaster, panic may be "iatrogenic": that is, the actions of emergency managers may determine the extent and duration of panic, to the extent it exists. For example, public reactions to an outbreak of meningitis [16] suggest that infectious disease and infection control specialists who routinely deal with contagion can help prevent panic by using the mass media and personal outreach in neighborhoods and at people's workplaces to provide credible, practical information on how to minimize the risk of disease transmission. Public information strategies

Table 1. Five guidelines to improve planning for and the response to release of a biological weapon by increasing the involvement of the public.

Guideline, specific step(s) for implementation
Recognize that panic is rare and preventable
Create a positive, constructive role for the general public
Release timely, accurate public information, including instruction in personal protective measures
Enlist the general public as a capable partner
Use civic organizations to assist with information dissemination, outbreak monitoring, and medication distribution
Think beyond the hospital for mass-casualty care
Develop plans for home-based patient care and infection control as part of plans for a community-wide response to deal with mass casualties
Involve lay and alternative care providers
Use family, neighbors, and community groups to identify patients, disseminate information and therapies, and assist affected individuals in obtaining treatment
Provide information, which is as important as providing medicine.
Plan a health communication strategy that empowers the general public
Produce multilingual and culturally relevant health information
Educate the educators; make use of local spokespersons to disseminate information
Be timely and forthcoming with information about the limits of what is known
Assume that the public will not take the pill if it does not trust the doctor
Educate the public, before an attack, about what is being done to prepare and respond
Ensure open flows of information during an attack through mass media outlets and interpersonal exchanges (e.g., town meetings, workshops, chat rooms)
Build nonadversarial relations with the press and respond to media requests for information
Create participatory decision-making processes by including the public, especially in discussions about how to allocate scarce resources and institute epidemic controls that compromise civil liberties

aimed at demystifying the world of microbes, as well as instruction in personal protective practices, reinforce the public's sense of control, and would be important steps toward "vaccinating" the public against panic. This argument is bolstered by research on factors known to provoke and amplify worry, fear, helplessness, and anger in threatening situations [17, 18].

The image of a panicked mob makes exciting footage in disaster movies, but it obscures a broad range of possible public reactions. The empirical study of collective behavior during disasters documents stress, fear, depression, and other negative responses, but it also points to emergent patterns of action that show cooperation, adaptiveness, and resourcefulness. Often, behavior that is not sanctioned by officials is erroneously defined as panic, rather than as an effective response of resourceful people acting in concert. Officials may be inclined to see a "command-and-control" model of disaster management as the only rational approach. In 1979, when a partial meltdown occurred at the nuclear power plant at Three Mile Island (south of Harrisbug, PA), almost 40% of the population within 15 miles of the nuclear plant evacuated the area on their own. In the absence of clear information or leadership from public safety officials, residents made the reasonable decision to remove themselves from a situation of unknown and potentially significant risk, and they did so effectively and without evidence of panic [19].

Further protection against social disorganization and panic is provided by deeply ingrained norms of civility and sociality. For instance, panic was rare in the stairwells of the World Trade Center when it was bombed in 1993 [20]. The calm and orderly evacuation of the towers was aided by the fact that people in the buildings knew each other from working together and sharing the same office floor. Because of these social ties and the perception that exits and stairways were accessible, groups of office workers cooperated in vacating the building calmly and efficiently. Initial reports about the evacuation of the World Trade Center during the attack that occurred on 11 September 2001 suggest that people's responses were equally clearheaded and cooperative. This study [20] and others have shown that standards of civil behavior prevail even in the most challenging circumstances. Social chaos does not occur in disaster situations because people tend to respond in accordance with their customary norms and roles (e.g., the able-bodied assist the impaired, supervisors assume responsibility for the safety of those they supervise, and friends look out for friends) [14]. This finding suggests that plans for a response to bioterrorism should attempt, whenever possible, to recognize and capitalize on existing social relations. For example, if quarantine should be necessary, establishing cohorts of individuals who are already known to one other in some capacity might be better than creating clusters of strangers.

History demonstrates that large-scale, fatal epidemics of previously unknown disease can create significant social disruption early in the outbreak. Such disruption can include unwarranted fear of exposure to the disease, suspicion of others, and stigmatization of individuals or groups who have become infected or are presumed to be carriers of disease. However, these effects tend to become less severe as communities develop routines and strategies for coping, even during epidemics of such horrific diseases as the plague in 14th-century Europe and HIV/AIDS today [21]. This finding suggests that effective communication strategies will be needed early during the outbreak and that substantial planning may be necessary far in advance of an incident.

Enlist the general public as a capable partner. Emergency services personnel, when focused on executing their professional duties, tend to think of the public as passive bystanders who are dispensible to the business of response. To the extent that medical resources exceed the medical needs of a specific event, this view is reasonable. At the scene of a traffic accident, for example, members of the general public are separated from the response operation by the familiar barrier of yellow tape. By definition, however, a disaster is an event that generates casualties in excess of available resources [22]. In those specific circumstances, this "yellow-tape phenomenon" is vestigial. Data show that ordinary, nonprofessional citizens are capable of full and useful participation in times of crisis [12, 23]. In general, nonprofessionals in the immediate vicinity have saved the majority of people rescued in disasters, greatly aiding the work of the professionals who respond [24].

It makes little sense to talk about the "general public" as if it is a single entity, in the same way that it makes little sense to talk about a single US health care "system." The general public is comprised of an interconnected matrix of networks and subnetworks organized around social institutions and relationships. Individuals are members of organizations and groups whose social ties, resources, communication links, and leadership structures might be used to facilitate a better and more coordinated response after a terrorist attack. Examples of these networks include civic networks (e.g., churches, social clubs, and schools), occupational networks (e.g., businesses, labor unions, and professional organizations), and information networks (e.g., libraries and Internet chat rooms and bulletin boards). Each network can be thought of as a potential conduit for organizing or facilitating public responses that are beneficial. For example, church groups might distribute antibiotics, convene vaccination meetings, or arrange visits to the homes of people who are ill. Social groups, such as the Kiwanis or Rotary Clubs, might activate phone trees to gather case reports, trace contacts, or disseminate instructions on appropriate use of medications.

Planning for bioterrorism response has not, to date, defined a role for the public in disease surveillance, even though the

general public historically has been an accurate source of reports of infectious disease outbreaks [25, 26]. Rumor-reporting systems and emergency telephone hotlines—2 channels of information from the general population—have been invaluable to epidemiological investigations and efforts to trace contacts, and they have been important sources of information on the adverse effects of vaccines and antibiotics administered to control outbreaks [27, 28]. As suggested by the Spanish influenza pandemic of 1918, the role of the general public in providing outbreak data becomes all the more critical in the context of a catastrophic epidemic [29]. Health care providers and institutions may be so consumed with caring for casualties that they will not be able to devote sufficient time or resources to the tracking of new cases of disease [30].

Not only is it possible to imagine networks of public responders that can aid in information dissemination, outbreak monitoring, resource distribution, and even patient care, but, in the midst of a collective crisis, a positive and active role for community groups and individual citizens provides a potential antidote to panic and other adverse psychological effects [7, 17]. In times of crisis, having a constructive role to play engages people in a common mission and provides a sense of control in periods of grave uncertainty.

Think beyond the hospital for mass-casualty care. Much planning for bioterrorism response has been guilty of double myopia. First, it has assumed that the formal hospital system will be capable of managing the disaster alone. Second, it has assumed that the general public is incapable of playing a role in the medical response. During the past decade, mergers, downsizing, workforce shortages, and the shift toward outpatient services have reduced the number of hospital beds drastically in all major medical marketplaces. The existing network of hospitals probably would not be capable of adequately caring for the people affected by a large-scale bioterrorist attack. Because hospitals function according to a "just-in-time" management principle for nursing, medicine, and equipment, they typically do not have the capacity to handle patient loads that are greater than projected [31]. Hospitals, in general, lack the capacity to cope with an unexpected surge of patients. In the aftermath of a significant bioterrorism event, overburdened hospitals may be forced to turn patients away, discharge those who are the least ill, and ration finite supplies and personnel; each of these responses occurred during the 1918 influenza pandemic [29].

Plans have been made at the national level, as part of the Domestic Preparedness Program, for the mobilization of military teams and mobile medical care facilities; however, in most major US cities, in even a small outbreak of epidemic disease, hospital-bed capacity could be exceeded quickly [32, 33]. Whatever partnerships might be imagined between clinics, hospitals, the Veterans Administration hospital system, and other inpatient care systems, hospitals could plausibly reach the limits of their functional capacity. What is needed is a plan that includes the possibility of home-based treatment and supportive care arrangements to augment hospital-based care. The majority of victims of the Spanish influenza outbreak of 1918, for example, were cared for at home by family, neighbors, Red Cross volunteers, visiting nurses, and hospital social workers, among others [29].

Information on responses to infectious disease emergencies is not, however, the only source of evidence in favor of a decentralized response. Professional health services are only a small percentage of the total care that patients receive on a regular basis. Family members and other lay nonprofessionals provide the vast majority (70%–90%) of routine care in communities [34, 35]. Emergency plans for distributing to the general public resources and information about nutrition, sanitation, infection control, and the care of seriously ill persons could be of great value in a response to bioterrorism. For instance, a network of community information centers was critical to the functioning of Israel's emergency health system during the Persian Gulf War in 1991; these centers dispensed medical information, medication instructions, and reports indicating which hospitals, clinics, and pharmacies were open [36].

Provide information, which is as important as providing medicine. Review of relevant historical examples suggests that effective leadership and delivery of clear, credible, and timely information both during and after a bioterrorist attack would be critical components of a response. In the face of uncertainty, the general public would need reassurance, descriptions of the response measures under way, instruction in personal and collective protective measures, and messages of hope. Infectious disease professionals (along with emergency managers) would have a critical role in helping to distribute this information in a timely and credible manner, which might significantly lessen the impact of a bioterrorist attack [7, 37]. On the other hand, the release of inaccurate, confusing, or contradictory information by leaders and/or the media has the potential to increase levels of fear, panic, and demoralization, as well as to discredit authorities. Moreover, failures of communication among government officials, health experts, and citizens can create misunderstanding, suspicion, and resistance that ultimately inhibit efforts to halt the spread of disease [38, 39].

Considerable resources are required to disseminate information to the public in an emergency, as was demonstrated during a recent outbreak of West Nile virus in New York City in 1999 [40]. Health officials and emergency managers conducted a massive campaign to educate the public through daily press conferences, regular media releases, a telephone hotline, Web-site updates, multilingual brochures and fliers, and per-

sonal contact at the epicenter of the outbreak. This campaign severely strained existing human resources, underscoring the problem of surge capacity for health departments. Telephone hotline staff, 25–75 of whom were required per shift, answered telephone calls for 24 h each day and fielded a total of >150,000 inquiries during a period of 7 weeks. A significant bioterrorist attack certainly would generate more calls than were made in the New York City area during the West Nile virus outbreak. Gathering data on the most frequently asked questions could be one step toward building a more responsive public information strategy.

A bioterrorist attack is likely to produce a climate of grave uncertainty and insecurity. As has been the case in historic epidemics, the general public will try to make sense of the experience of sudden, widespread disease [41]. Questions such as "Why?" "Why me?" "What next?" and "How and when will this end?" will abound. Public health officials should anticipate the need to provide accurate and timely information about the nature of the attack and the steps that are being taken to mitigate its effects. Reporting systems that track the scope of the epidemic will be critical to these efforts. At the same time, health authorities should also be open and candid about the limits of available information and resources. To the extent that the general public perceives that public health officials are failing to provide accurate appraisals of the outbreak's scope and impact, a credibility gap will open rapidly, causing individuals to seek alternative (and perhaps less accurate) sources of information. Evidence from the public health response to the recent anthrax outbreaks illustrates the deleterious impact on public trust that can result from what John Schwartz of the *New York Times* has referred to as the "spin-control" model of public information release [42]—that is, a risk-averse approach that avoids full and complete disclosure in order to minimize potential negative political consequences of actual or perceived errors with respect to a response.

Public health officials should also expect requests to list specific steps that individuals can take to lower their risk of either being exposed to infectious agents or transmitting them. Along with the need for a pharmaceutical stockpile of vaccines and antibiotics, there is an urgent need for an information stockpile, including public service announcements about infectious disease concepts (e.g., contagion and the value of vaccination), infection control procedures to be followed at home, and information for the public in the event of the need for quarantine. Official spokespersons need to be prepared to discuss both the benefits and the risks of epidemic control measures while clearly advocating the need for recommended actions [43]. Health officials and hospital administrators need to be prepared to indicate which hospitals and clinics are capable of taking patients and where other critical medical resources exist [36]. Efforts to provide adequate information will undoubtedly be complicated by the shifting sands of what is known and the interruptions in the flow of information that characterize all public emergencies.

The public will not take the pill if it does not trust the doctor. Stopping a disease outbreak will require that public health professionals and government leaders carefully nurture the general population's trust and confidence in the institutions of public health and government and their actions, especially if large-scale disease containment measures are necessary. After a bioterrorist attack, public trust could be a fragile asset, yet it is essential. The issue of trust bears significantly on 2 critical aspects of the medical and public health response to bioterrorism: (1) the choice of strategies for effective communication with the public, and (2) the processes for debating, as a society, some of the more ethically complex dimensions of disease containment.

Although there is a tendency to view the media as an impediment to emergency response, a bioterrorist attack would necessitate a close working relationship between the media, decision-makers, and those involved in response operations. Given the speed with which news reports circulate today, and given the importance of the media in shaping public responses, health departments and hospitals would need to be responsive to media requests for information [28, 44]. An important step toward maintaining an effective, nonadversarial relationship with the press is to have more routine interactions with reporters, producers, and editorial boards before periods of crisis. During an emergency, health professionals could then build on their relationship with the media to effectively disseminate an accurate account of events, provide vital disease control information, and communicate the rationale and justification for the necessary medical and public health responses.

Mass media outlets can get vital information to the largest numbers of people the most quickly. However, the mass media and the Internet are not sufficient. Additional communication strategies would be critical to enlisting the public as partners in implementing epidemic controls. Multilingual materials and culturally relevant messages that are endorsed and delivered by persons who have local respect and authority can help ensure that control measures are successfully disseminated to all sectors of a diverse community [6, 45]. Direct personal contact has the most significant effect on a person's willingness to trust and act on health-related information [17, 45]. Public outreach strategies of health departments and emergency services should include interpersonal exchanges of information—for example, town meetings and public workshops. On the other hand, the realities of an outbreak of a disease that is propagated by person-to-person transmission would require alternatives to such public meetings. Under those circumstances, means of remote communication (e.g., "telephone trees," Internet-based communications, and newsletters) would be important alternatives.

The extent to which the general public supports large-scale, potentially disruptive disease containment measures may also depend on the transparency and accessibility of the decision-making process. Accounts of historic epidemics demonstrate that extreme containment measures, such as quarantine, can be perceived as being more problematic than the disease itself. During an outbreak of polio in 1916 in a Long Island community, a large citizens' group protested the sometimes forcible removal of sick children from the care of parents to an isolation hospital [38]. Enlisting the public as partners in disaster response would likely require the use of participatory decision-making bodies, such as citizen advisory panels, for responses that require a community's ethical judgment (e.g., setting priorities for use of scarce medical resources, such as antibiotics and vaccines) [17]. Strategies for public discourse and a participatory and transparent decision-making process in the midst of an epidemic might involve enlisting leaders of local religious organizations or labor groups to provide feedback about proposed epidemic control measures.

CONCLUSION

Resourceful, adaptive behavior is the rule rather than the exception in communities beset by technological and natural disasters as well as epidemics. As planning for responses to acts of bioterrorism evolves, it is important to develop strategies that enlist the public as essential and capable partners. The recent terrorist attacks in New York and Washington, D.C., draw attention to the important role of nonprofessional individuals and groups in the immediate and long-term response to disasters with mass casualties that cannot be contained within a perimeter of yellow tape. Involving the public will require, in part, raising of the general public's awareness of their roles and responsibilities after a biological attack.

The complexity of people's reactions to the anthrax-tainted letters discovered after the 11 September tragedies further undermines any simple notions we might have about the general population's ability to cope with a bioterrorism crisis. What began as a single case of inhalational anthrax had become, by late November, an outbreak with 23 total cases of infection and 5 deaths that had disrupted the US Congress, the Supreme Court, and the US Postal Service. The exhortations of news editors, politicians, and pundits, which urged the public not to panic and to go about their daily routines, suggest how fearful decision-makers were about the potential for public hysteria. A preliminary assessment of events, however, indicates a temperate, if complex, response by the general public.

In the aftermath of the September 11 attacks, increases in the purchase of gas masks and ciprofloxacin were quickly seen. What was described as "panic buying" in some reports may have been a reasonable attempt to acquire protection in the face of stark, proven vulnerability to terrorism. Moreover, what appears to some as panic may be evidence of the public's resourcefulness when advice from professionals is confusing or nonexistent. Concerns about providing children with gas masks that fit and with correct doses of antibiotics also suggest that the public is not prone to panic but has a deep-seated need to seek protection for the most vulnerable members of society.

Health officials' warnings about the potential dangers of off-the-shelf respirators and personal drug stockpiles have also met a generally receptive audience. Seven of 10 individuals who were surveyed in a Gallup poll conducted on 21 October 2001 indicated that they had *not* thought about buying a gas mask or obtaining a prescription for antibiotics [46]. This and a second poll characterize the response of the general public as one of "reasoned calm" and "reluctance to panic" [46, 47]. Closer proximity to danger has not yet given rise to unreasoning fear and erratic behavior. In late October, a poll of Florida residents found that >50% had little or no concern about contracting anthrax [48]. Reports of mass testing and prophylaxis at affected work sites indicate that the process was orderly, as hundreds and sometimes thousands of individuals waited in line for their turn [49].

Increased vigilance regarding personal safety has resulted in a significant burden on professional responders. During October 2001, the Federal Bureau of Investigation investigated >2500 suspected anthrax attacks, many of which were reports by concerned citizens about harmless substances [50]. The health care system has also fielded an increasing number of demands for diagnostic tests by individuals who fear they may have been exposed to anthrax [51]. However, when seen in the context of conflicting reports from experts about the nature of the threat, as well as vague and nonspecific government alerts about additional possible attacks, the level of public concern appears measured and reasonable.

In short, evidence that the public cannot be trusted with full, accurate disclosure of what is known about a bioterrorist threat is lacking. The events of 11 September 2001 and after further undermine the view that the public is prone to panic, incapable of effective participation, and inclined to respond irrationally. How the public responds to this and any future threat of bioterrorism may depend, to a considerable degree, on how and to what extent decision-makers activate strategies that "vaccinate" against the risk that the public will distrust them, will rely on misinformation, and will be excluded from participation in decision-making.

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