

Demystifying Bioterrorism: Misinformation and Misperceptions

Eric Noji, MD, MPH;¹ Tress Goodwin;² Michael Hopmeier²

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1. Department of Homeland Security, Washington, DC USA
 2. Unconventional Concepts, Inc., Mary Esther, Florida USA

Correspondence:

Eric Noji, MD, MPH
Office of Terrorism Preparedness and
Emergency Response
Center for Disease Control and
Prevention
200 Independence Avenue, SW
Room 719-B
Washington, DC 20201 USA

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Abbreviations

AIDS = auto-immune deficiency syndrome
SARS = severe acute respiratory syndrome
WMD = weapons of mass destruction
US = United States

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Abstract

The true threat of bioterrorism remains mysterious and elusive to the common citizen. It principally has become the dominion of a few "experts", many of whom have limited apparent expertise, who have failed to effectively communicate the risks and realities to society, and have instead created an air of uncertainty surrounding the topic. Unlike the great classic deceptions of modern life (e.g., "the check is in the mail"), the misinformation and misperceptions associated with bioterrorism can be dangerous and are not merely humorous. Indeed, it is possible to grasp the facts as well as fallacies associated with bioterrorism, and, as a result, demystify this nightmare scenario and prepare for the "unthinkable".

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Introduction

With the emergence of new global threats such as auto-immune deficiency syndrome (AIDS), multi-drug resistant tuberculosis, West Nile Virus, and most recently, severe acute respiratory syndrome (SARS), it is becoming obvious that there are many ways to threaten the health and welfare of a society other than through the use of weapons and armed conflict.¹ One such method that has not been discussed until recently is bioterrorism. This threat poses a particular problem to our conventional notions of preparedness. Bioterrorism could unfold in ways for which we largely are unprepared and could bring devastating consequences to the international community. The anthrax attacks of 2001 clearly highlighted the necessity to take measures to protect a nation against biological terrorism. Funding for bioterrorism preparedness in the United States (US) has increased substantially over the last few years. The 2005 US Budget calls for approximately US\$6.98 billion for biodefense-related programs, an increase of 39% from 2004 and of US\$1.4 billion from 2002.^{2,3}

While the influx of funding is a positive development, bioterrorism preparedness efforts remain in their infancy. Outside of routine public health capacities, there is limited protection from the threat of biological warfare. In many areas, epidemic preparedness is limited, surveillance is minimal, and the ability to communicate warning or actively control disease is below what would be needed during an epidemic. A report commissioned by the Center for Disease Control and Prevention (CDC) that assessed the preparedness of the United States for a SARS outbreak revealed disturbing predictions of the potentially calamitous impact of a new resurgence in SARS, citing inadequacies in the public health infrastructure and insufficient numbers of public health personnel.⁴ The public regularly is bom-

barded with reports stating how *unprepared* the government is for a terrorist attack, yet there is a dearth of information for citizens on how to protect themselves as well as learn what steps are being taken locally and nationally to address the threat of bioterrorism.

Misperceptions of Bioterrorism

Uncertainty about how an individual can prepare for and respond to an event and what steps the government is taking to protect them can leave the public confused and anxious. The difficulties in responding to the anthrax release in the fall of 2001 were a prime example of a failure to adequately gauge the threat and provide accurate information to the public, which effectively established an air of fear and confusion around the term "bioterrorism". However, with education, the public can learn what is true about bioterrorism and what is erroneous. The task of educating the public is one of the key missions of the medical and public health community.

Foremost among the problems faced in educating the public is dispelling "facts" and things that "everyone knows" to be correct. Sometimes referred to as "urban legends", misinformation represents one of the key stumbling blocks that *must* be overcome before we can begin to effectively educate and prepare our communities. The following is a summary of commonly held false perceptions associated with bioterrorism and a discussion of the true facts surrounding them.

A. We can accurately predict and detect bioterrorist attacks—The perception that we are able to accurately predict all aspects of an attack, such as where, when, and what agent will be used, fundamentally is untrue. While it is possible to identify venues and situations that have a slightly higher probability (risk) of being targets, it is impossible to predict accurately what agent will be used or where, when, and how an attack will occur.

Thus, it is necessary to be prepared on a national and strategic level, to be able to effectively identify a potential incident or outbreak at the earliest opportunity wherever it may occur, and be prepared to move to mitigate the results as quickly and effectively as possible.

B. Bioterrorism will be preceded by a warning—Many may find comfort in the belief that there will be a warning prior to a bioterrorist attack. In most circumstances, warning would not be in the interest of the perpetrators, particularly if non-attribution were desirable for the purpose of avoiding massive retaliation and maximizing the amount of harm to a population. Perhaps this is the most serious potential scenario. In these cases, victims simply may begin to present to medical facilities for medical care in increasing and possibly overwhelming numbers. Furthermore, terrorists intentionally may try to misdirect response efforts by falsely warning the authorities or providing false or misleading information. For example, in the Rajneesh cult contaminations of salad bars with salmonella in 1984,⁵ the shigella outbreak among hospital laboratory workers eating contaminated pastries in 1997,⁶ and the most recent anthrax

attacks of 2001, there was no warning, and, with the anthrax release, no known perpetrator has been apprehended.

C. Bioterrorism preparedness essentially is identical to planning for chemical, radiological, or nuclear attacks—While an "all-hazards" approach to terrorism preparedness is appropriate, there are some unique aspects of biological terrorism that require a different approach. The inability to recognize that biological preparedness differs fundamentally from other weapons of mass destruction (WMD) continues to impede our progress to deal effectively with the specific threat of bioterrorism. For example, an attack using chemical agents usually only affects those in the immediate vicinity of the release, while bioterrorist attacks could affect a larger population due to the potential for person-to-person transmission.⁷ In many cases, there is no assurance that a biological attack can be detected early or can be controlled, while the consequences of a chemical or radiological event usually are finite and limited in scope.

Most chemical and radiological exposures in civilian populations are remedied by non-specific measures and involve separating potential victims from the threat and providing either supportive care or antidotes to those who are injured or ill. The rapid onset of symptoms—seconds to minutes in the case of chemical agents, hours or days for radiological incidents—makes treatment at the scene both necessary and practical. In these cases, the most important response efforts center on the first responders (e.g., hazardous materials (HazMat), emergency medical technicians, and ambulance-based physicians). Given the nature of biological agents (e.g., incubation period, lag-time before symptoms begin, difficulty in differentiating biological weapons from other diseases), hospitals, physicians' offices, and health departments become the "first responders" to an act of bioterrorism, requiring different medical, technical, or public health solutions.⁷ The initial responders and interventions required for treating victims of bioterrorism are unlike those associated with other weapons of mass destruction. The lesson: *One size of preparedness does not fit all.*

D. We will be able to rapidly determine whether an epidemic is natural or the result of bioterrorism—A commonly held belief is that there will be an obvious difference between an outbreak due to a naturally occurring disease and one caused by an agent of biological warfare. Proof that an epidemic is the result of bioterrorism may not be possible, particularly in the early stages of an epidemic, if common pathogens are implicated.

While an event might be attributed to bioterrorism, the investigation and identification of the perpetrators will prove to be extremely difficult. Consider again, the anthrax attacks in 2001: even after three years, despite an enormous investment of resources, to our knowledge, there still has not been an arrest or even a clear attribution in this case (despite the identification of "persons of interest"). There are many reasons for this, not the least of which is the fact that, unlike other terrorist incidents, the use of biological warfare agents is an extremely complex and completely new

approach. It also is one that we lack experience preparing for and responding to.

However, it is important to understand that there usually is no difference between treating a victim of a naturally occurring disease versus a biological warfare or bioterrorism agent. The most serious outcome in these cases—regardless of its origin—is an epidemic of a highly contagious and deadly disease. In such cases, the most important medical priority is to control the epidemic, regardless of the underlying cause. The lack of clear clinical distinctions between acts of bioterrorism or a natural outbreak is critical and cannot be overstated. Once the act of bioterrorism has occurred, from the medical and public health perspective, the objectives of the perpetrators are only peripheral to controlling the epidemic. The broad objectives of such a response to a biological terrorism event, pandemic influenza, emerging infectious disease, or novel pathogen outbreak are to:

1. Detect the event through disease surveillance;
2. Identify and protect the population(s) at risk;
3. Quickly frame the public health and law enforcement implications;
4. Control and contain any possible epidemic;
5. Augment and surge public health and medical services; and
6. Track and defeat any potential.

E. Nothing can be done to prepare the civilian population for a bioterrorist attack—In the popular media, there often is a feeling of defeatism that nothing can be done to prepare for a bioterrorist event. However, many safety measures and epidemic response capacities can be developed to protect the population. Such measures include expanded surveillance, mobilization of caches of drugs and vaccines, and the epidemiologic tracking of critical health resources, such as hospital beds and emergency medical services utilization.⁸ Preparedness for bioterrorism can yield significant “dual” benefits in strengthening the response to natural disease outbreaks and seasonal epidemics (e.g., influenza).

F. Effective preparedness for a bioterrorism attack can be achieved without major investments in basic bio-scientific research—Due to the lack of public awareness of bioterrorism, many believe that we can be prepared for attacks and naturally occurring diseases without investing in basic bio-scientific research. During the next 5–10 years, there will be a revolution in biotechnology. New vaccines, antibiotics, and a basic understanding of the pathogenic nature of diseases are critical to defeating bioterrorism. An investment in basic science and fundamental research is absolutely necessary to accomplish these objectives. The task is not one iota less complicated nor resource intensive than that required by the Manhattan Project in World War II. Defeating bioterrorism will require a similar level of sustained scientific and technological investment. Furthermore, as in the exploration of space, there is a high probability that such an investment will yield other benefits unrelated to bioterrorism preparedness.

G. Hospitals can treat a large influx of patients following a bioterrorist attack—Strengthening healthcare surge capacity—the ability to handle increased patient volumes—is vital. Achievement of adequate surge capacity (conditional needs) for acts of terrorism also will better prepare hospitals to handle non-terrorist events that tax and overburden the system. For example, the flu season of 1999–2000 overwhelmed hospital emergency departments, resulting in the diversion of patients to other facilities. That season’s influenza strain was not particularly virulent and the number of cases was not higher than average. The primary difference between 1999 and other years was the earlier start of the flu season, which caught the public health and medical system off guard.⁹ Given that the response to a bioterrorist attack is very similar to natural disease outbreaks, strengthening health and medical response capabilities will reap additional benefits.

H. Bioterrorism preparedness and response is a national responsibility—In times of emergency, the public will look for guidance from local, regional, and national level government authorities. National level police and emergency management and public health authorities have an important role in responding to a bioterrorist attack. However, unless local communities take responsibility for developing plans, capabilities, and linkages to healthcare organizations and public health agencies, controlling a deliberate epidemic in a timely manner will not be possible. Local responders, public health and medical personnel, and healthcare facilities will bear the major burden of treating patients and containing an epidemic caused by bioterrorism. However, these efforts must be coordinated with national authorities to assure a successful response, placing the burden on both the local and national level agencies. Strengthening local response also can raise the visibility of preparedness efforts and enable local leaders to educate their community.

Conclusion

The timely and accurate communication of information to the public is a vital part of preparedness. An important priority of risk communication is dispelling misinformation and replacing them with the realities of bioterrorism. Such educational efforts must be directed not only to the general public, but also to medical, public health, and law enforcement providers. Critical capacities must be developed using existing knowledge of disaster management and the basic tools of public health—surveillance, laboratory science, disease control, and health informatics. As demonstrated by the recent global response to the SARS epidemic, it is clear that progress has been made. But much still must be done.

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