

## Research Note

# Ethical Issues of Bioterror

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*Bioterrorism has global implications, especially with regard to the use of contagious bio agents or “epidemic generators” with a high potential for causing epidemics. The grave medical implications of a bioterror attack are obvious, but some of the related ethical issues are often overlooked. Moral issues associated with the threat and with the attack may carry long-term consequences, which may shake the rudiments of democratic societies. Some of these efforts may be aided by regulations, laws, and enforcement. The best results will be achieved by a sense of responsibility and understandings of the public.*

Since 11 September 2001 more than 5,250 people around the world have lost their lives in terror attacks. This count does not include Iraq (data not available). Among the affected locations were the United States, Israel, Indonesia, Turkey, Egypt, Saudi Arabia, Kenya, Tunis, Morocco, Spain, Russia, and the United Kingdom.<sup>1</sup> There is an ongoing change in the patterns of terror. The various terror groups are constantly improving their coordination efforts, exchanging information and expertise, and even competing among themselves—who is more successful or takes greater risks. Al Qaeda as an example is a multinational group that funds and schemes the activities of Islamic militants worldwide. This organization maintains loose connection mainly via the Internet with Islamic extremists in different continents. The organization extends its influence and an active cell was disclosed lately in Sinai Egypt and a small number of Al Qaeda militants had entered the Gaza strip. The main goal of terror today is much beyond wide media coverage and attention. Its aim is mass killing, and the aim of the most prominent Islamic terror is mass massacre

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of “infidels,” which is characterized by ultra violent murders, videotaped slaughtering, and decapitations. Thus, present-day terror is more innovative and deadlier than ever.

Bioterrorism in particular, initiated as a silent attack, has global implications, especially with regard to the use of contagious bio agents or “epidemic generators” with a high potential for causing epidemics. This term refers to bacteria or viruses that induce infections that can be transmitted from person to person, and may develop into an outbreak that is not limited to the scene of the incident, but can escalate and cause widespread casualties. Bioterrorists acts were regarded as “low-probability, high consequences events.”<sup>2</sup>

The salient objectives of terrorism include creation of mass murder and casualties, the creation of panic, as well as shaking the foundations of democratic society. Bioterror can accomplish these without doubt.<sup>3</sup> Avoidance of the use of bio agents as weapons could have been explained by the fact that terrorists may perceive that conventional weapons have not yet exhausted themselves, by the apprehension of affecting terrorists allies and by the inaccessibility of these appliances of the terror groups.

The grave medical implications of a terror attack are obvious, but some of the related ethical issues are often overlooked. Moral issues associated with the threat and with the attack may carry long-term consequences, which may shake the rudiments of democratic societies. The outbreak of SARS in 2003 served as an excellent demonstration of some of the complex problems associated with containment and control of an epidemic outbreak caused by a highly infectious agent on the regional, the national, and the international levels. Therefore one should expect policy to be dictated top down from the health ministry to local hospitals or Emergency Medical Service (EMS) and not bottom up, as is often the encountered situation in the United States. In Israel, basic guidelines relating to medical and administrative management of terror attacks are distributed by the Ministry of Health and Home Front Command. These general guidelines, which are written by consensus committees of experts from all over the country, are therefore well accepted. These generic algorithms are translated by each medical organization to an institutional specific Standard Operating Procedures (SOP). Inter-organizational interactions are dictated by the ministry of health. The plausible global implications of bioterror often dictate international cooperation and this will cause complications due to different law systems, cultures, religions, and values.<sup>4</sup>

The main dilemma when dealing with the possibility or actual bioterror attack is maintaining the balance between the civil rights and liberties of the individual versus the interests of the entire community. This conflict is inherent in public health (e.g., refusal of vaccination by an individual because he feels protected by other society members’ immunity—herd immunity). These issues are much more prominent in the dire scenario of a biological attack, in particular associated with contagious agents (e.g., smallpox).

Some mathematical models have been developed to forecast the spread of biological agents used during a bioterror attack and to recommend measures to be taken in an attempt to decrease mortality. For anthrax the main recommendations include pre-attack vaccination of medical teams, aggressive oral antibiotic treatment to asymptomatic populations in the afflicted area, and the creation of a surge capacity for hospitals.<sup>5</sup> For smallpox containment current guidelines will suggest the isolation of symptomatic patients, tracing and vaccinating their contacts, and quarantine of patients with fever. The mathematical model suggests that mass vaccination will decrease mortality and eradicate the epidemic much more rapidly.<sup>6,7</sup>

Another model regarding smallpox attack confirms these findings, but also suggests increasing herd immunity by voluntary pre-exposure vaccination, and immunization of first responders.<sup>8</sup>

By evaluating the main ethical concerns related to bioterror pre-attack dilemmas and post-assault considerations can be addressed.

## **Pre-Attack**

### ***Vaccination***

From 1850 till 1979, the year when smallpox was declared eradicated, one billion people succumbed to the disease. The disease is very contagious because each infected individual may spread the disease to 10–20 others, and mortality among nonvaccinated people is about 30 percent.<sup>9</sup> Complete global eradication of this disease provides the best evidence for the efficiency of the smallpox vaccine. In addition, severe side effects to vaccination are well reported and death may occur in 1 to a million of those vaccinated for the first time and 0.25 to a million with booster vaccination.<sup>10</sup>

Anthrax vaccination is probably safer, but less is known regarding its human efficiency, especially as regards exposure to inhalational anthrax, which is the main terror-related threat. In anthrax, which is not contagious, there is no protective effect for the society, but only for the individual himself.<sup>11</sup>

Recommendations should be dictated by the level of threat. For smallpox a reasonable pre-attack policy will be the encouragement of first responders' vaccination, and the offer of voluntary vaccination. Vaccination should be avoided in all those with contraindications. Shortage of resources for vaccination (vaccines and/or manpower) may be associated with complicated moral issues: Who should get a priority access for vaccine? The elderly and sicker or the capable youngsters? The favored "discrimination" would be for the advantage of those with the high risk for exposure (e.g., medical personnel).

### ***Research and Publications***

An article titled "Analyzing a bioterror attack on the food supply: The case of botulinum toxin in milk"<sup>12</sup> was to be published in the Proceedings of the National Academy of Sciences in late May 2005 but due to a request from the Department of Health, publication was delayed. In the end it was released for publication on 27 June as is.<sup>13</sup> The concern regarding this publication seems realistic, because the article provides the recipe to affect 500,000 people, half of whom would die, using 10 grams of botulinum toxin. Some of the current studies regarding genetic manipulation of microorganisms harbor dangers of creating vaccine- or antibiotic-resistant strains or species that might be targeted to specific human characteristics or races. Is it feasible to try and censor scientific publications in order to try and attempt to avoid the distribution of delicate knowledge with potential harm, or should the sense of responsibility of the authors or editors be relied on? Censorship is very complicated in the era of the Web and responsibility is not a trivial request in the "publish or perish" environment.

Another solution might be to require security clearance from scientists from certain disciplines. Although this is in contradiction to what could be called "academic freedom," one might think that total scientific sovereignty in an era of full war against terror is a luxury. Certain biomedical publications might aid terrorists to gain the know how to produce and weaponize microorganisms and toxins. Some of these microorganisms might be cultured with quarantine an enhanced resistant to antibiotics and vaccinations. In an attempt to deal with these concerns, some biomedical journals editorial boards and medical societies modified their process of editing, to provide additional review by an in-house or by external

terror experts. This new process had led to only minor changes in a few published articles.<sup>14</sup> This process is more accepted than an actual legal act.

We can “quote” the imaginary American president stating in Tom Clancy’s book *Executive Order* in response to an Ebola attack on U.S. soil: “The constitution is not a suicide pact.”<sup>15</sup>

While minimally voluntarily modifying very few scientific papers with an obvious potential for abuse by terrorists, the authors believe that broadcasting of non-classified information regarding threats and defense measures will enhance cooperation and better adoption of preventive measures by: medical professionals and scientists.

## **Bioterror Attack**

### *Information and Media*

Modern communication systems can contribute positively to the twin objectives of coordinating the activities of countries and international organizations, and standardizing and classifying terms acceptable to one and all. For instance, a “hot line” between heads of organizations such as counterintelligence directors, police chiefs, antiterrorist unit commanders, government ministry CEOs, or ministers in different countries, among others. This is essential in order to enable the real-time transmission of reliable information during emergencies for the purpose of making rapid decisions under short-cut procedures.<sup>16</sup>

Benchmarks of information, experience, and preparedness are most essential, and especially so in the health care system. One of the leading issues is the “Information Dilemma”—finding the balance between giving advance warning of a possible epidemic outbreak and ascertaining the likelihood of its occurrence. Early detection of an impending outbreak can be gained through sentinels (early identification of the initial victims by family or emergency department physicians) or by computerized surveillance systems, who gather data on the occurrence of symptoms in the community. Several questions arise on this context of timing; among them, How significant would a delay be in making the announcement? The pros for an early statement would be extra time for the public to organize and the observance of reliability. The cons would be causing unnecessary panic in the case of false alarm and affecting silent event investigation by law enforcement authorities. One must try and maintain the balance between providing good and adequate information and the avoidance of extensive panic. Again, the limitations of keeping information from the public should be remembered, especially in the era of the Internet. The ongoing provision of accurate and transparent information by well-trained authoritative spokespersons should decrease anxiety and enhance trust. The provision of analyzed data by communication experts and professionals through the media ought to enhance cooperation by the public and may on the one hand decrease the need and magnitude for enforcement measures and on the other hand increase the chance of voluntary acceptance of desired measures.<sup>17</sup> Family physicians are probably regarded as more reliable than politicians, and therefore can be a good source for information and guidance to the public, via direct personal contact or through the media. Health providers should be instructed how to provide useful information while avoiding unnecessary anxiety.

### *Triage*

During a mass casualty event, when needs exceed resources, proper triage is of a crucial importance. Good triage implies allocating resources to needs, while bringing the victim

to the proper medical facility and containment of the chaos. Triage is associated with tough ethical questions: Whom to give priority for treatment and evacuation, those who are critically sick or victims who are mildly affected but with better chances for salvage? Precise triage criteria cannot be predetermined, but should be decided on real time, taking into consideration the magnitude and nature of the event.

### ***Quarantine***

This is by far the strongest and most controversial measure that might be taken during a bioterror attack involving contagious agents. There might be a situation in bioterror attack utilizing contagious agents such as smallpox, hemorrhagic viruses, or plague, which will warrant the consideration of quarantine.<sup>18</sup> Quarantine will be acted by abolition of mass gathering such as during sport events, performances at theatres, and so on. Those suspected of being exposed and their intimates would be limited to their household. Inner country and certainly international transportation might be limited. Certainly with modern transportation, by the end of the incubation period of 10–17 days, many of the affected people would be remote from the site of the initial exposure.

Quarantine is associated with complete limitation on the mobility of healthy people who are suspected of exposure. For sick people the rate term will be isolation. Quarantine is an extreme example of the limitation of an individual's rights for the assumed benefit of society. Furthermore, there are also some concerns that quarantine may increase the danger of the population within it.<sup>19</sup> More extreme quarantine scenarios may include isolation of neighborhoods or entire cities and imposing curfew by the police or even by the army. These “doomsday” acts are of course better avoided, by attempts to avoid panic creation and by appealing to the public good will.

Quarantine may be enforced nationally or more reasonably internationally. Taking into consideration the nature of the disease, the estimated period of this measure will be weeks. This most significant decision should be taken by top leaders who will consult local and international health authorities. How is quarantine best ensured? The best way obviously is to achieve it voluntarily. Still, there should be a legal framework to enable this extreme act.<sup>20</sup> The idea behind this is the “Normal Justification Thesis” (NJT) described by Joseph Raz.<sup>21</sup> According with this principle the individual will sometimes benefit by accepting the dictation by authority rather than by making his or her own choice. The best example is the instruction to drive on the right side of the road (in certain countries on the left), rather than to permit each driver to make his own choice.

A preliminary condition for acceptance and cooperation of the public is to ensure that basic daily needs will be guaranteed while being in quarantine. The most obvious are the daily provision of food supplies. Others would be maintaining phones and preferably multimedia communication with family members and friends. Entertainment and information should be offered through the media and the Internet and are also expected to enhance compliance. Society leaders should plan in advance measures of reimbursement for salary loss by people who are prevented from work.<sup>22</sup>

Another concern is the well-being of the health care providers and other first responders. Medical professionals might be scared to be exposed to contagious patients out of concern for their and their families well being. To avoid voluntary and involuntary absence and to better cope with this ethical dilemma, vaccination and prophylactic antibiotics should be offered to these helpers and their families as a first priority. Full protection gear should be offered when necessary; otherwise staff may be reluctant to come in contact with the victims. It is worth recalling that in a recent Marburg Virus

outbreak in Angola, out of the 230 fatalities encountered, 14 were nurses and 2 were physicians.<sup>23</sup>

To conclude, bioterror is characterized by a silent attack that may evolve into an international outbreak. Some complex ethical considerations are associated with the attempts to prevent such attacks and contain them once they occur. Some of these ethical concerns relate to: (1) The question whether to censor some biomedical researches and interrupt academic freedom. (2) Priorities for triage and of access to preventive and curative medical care. (3) How to minimally intervene with civil rights during an outbreak and quarantine (4) How to administer balanced and reliable information while avoiding panic.

Some of these efforts may be aided by regulations, laws, and enforcement. Leaders should continuously weigh the delicate balance between personal rights and the benefits of the community. The best results might be achieved by appealing to the sense of responsibility of the public and commitment of scientists and health care providers.

Ethical dilemmas associated with bioterror seem remote and therefore are much tougher to handle pre-attack, but the reaction to a harsh strike is often too late and might demand more extreme measures. Therefore, this article warmly suggests that different ethical scenarios will be discussed pre-event by groups of experts from different disciplines such as: physicians, nurses, religionists, lawyers, philosophers, reporters, spokespersons, and politicians. These dialogues should lead to mutual understanding and to relevant modifications of the Standard Operating Procedures and to the development of a proper pre-event and event information policy.

## Notes

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