

## Bioterrorism – The Biological War

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### SUMMARY

Intentional or threatened use of viruses, bacteria, fungi & toxins (from living organisms) produce death or disease in humans, animals or plants. The intentional release or threat of release of biologic agents in order to cause disease or any death among human and food crops or agriculture and animal husbandry to terrorize a civilian population or manipulate the government in the present scenario of increased terrorist activity has become a real possibility. The most important step in the event of a bioterrorist attack is the identification of the event. This can be achieved by generating awareness, having high degree of suspicion and having a good surveillance system to assist quick detection. Bioterrorist attacks could be covert or announced and caused by virtually any type of pathogenic microorganism. A bioterrorism attack in a public area is a large public health emergency. Early detection and rapid investigation is the key to contain such attacks. The role of public health epidemiologist is critical.

### INTRODUCTION

"Bioterrorism refers to the intentional release of biological agents or toxins for the purpose of harming or killing humans, animals or plants with the intent to intimidate or coerce a government or civilian population to further political or social objectives." The threat of biological warfare seems remote to most industrialized and developing nations. The threat of bioterrorism, in which biological agents are used by extremists as weapons against civilian populations, is a matter of concern. A bioterrorist attack is tough to predict, the consequences of a successful attack could be destructive and cannot be ignored. Bioterrorism and its effects can *burden* heavy demands on the public health care system which will be called upon to handle the consequences. An effective public health care system with strong disease surveillance, rapid epidemiological and laboratory investigation, efficient medical management, information, education and communication will be required to counter any act of covert or overt bioterrorist attack. In India there has been no documented case of bioterrorism so long.



### Current scenario in India

No confirmed incidents of bioterrorism attack in India yet find. An incident: In the year 2001, the office of the Deputy Chief Minister of Maharashtra had received an envelope having anthrax spore. Due to this, several incidents were suspected to be acts of bioterrorism retrospectively. Some of them are as follows:

- 1994, Pneumonic plague attack happened in the Surat
- 1996, Dengue hemorrhagic fever attack in Delhi
- 1999, Anthrax attack in Midnapore
- 2001, the Mystery ‘encephalitis’ attack in Siliguri.

### Characteristics of bio agents for bioterrorism

- The high morbidity and mortality rate.

- Potential capable for person-to-person spread.
- Low infective dose and highly infectious by aerosol/ air spread.
- Lack of rapid diagnostic capability.
- Lack of universally available vaccine present.
- Potential to cause anxiety.
- Environmental stability.
- Database of prior research and development.

**Examples of Bio-Agents Used for Bio-terrorism-**

Fulfilling these criteria, *Variola major* (smallpox) could be a potential bioweapon as no vaccine is available against it. Ricin (*Ricinus communis*) toxin to be inhaled into the lungs. *Salmonella typhimurium* bacteria causing severe food poisoning.

**Effective Control Measures**

Public health is an important pillar for any national security and therefore an effective response is required against bioterrorism. This can be achieved through multimodal and multiagency approach and many of these approaches are relatively straight forward. Effective control measures against bioterrorism are as follows:

- Biosecurity
- Vigilance tools
- Research programs by NIAID (National institute of allergy and infectious diseases)
- Planning for risk management
- v). Bioterrorism act

**Table 1. Agent of Bioterrorism**

Category A agents	Category B agents	Category C agents
Bacillus anthracis (anthrax)	1.Alpha viruses	Hanta viruses
Clostridium botulinum toxin (botulism)	2.Brucella (brucellosis)	Nipah viruses
Francisella tularensis	3.Burkholderia mallei (glanders)	Tickborne encephalitis viruses
Variola major (smallpox)	4.Coxiella burnetii (Q fever)	Tickborne haemorrhagic fever viruses
Yersinia pestis (plague)	5.Clostridium perfringens	Yellow fever
Filo viruses	6.Ricin toxin	
Ebola virus	7.Staphylococcal enterotoxin	
Marburg virus	8.Cryptosporidium parvum	
Arena viruses	9.Escherichia coli O157	
	10.Salmonella species	
	11.Shigella dysenteriae	
	12.Vibrio cholerae	

**CONCLUSION**

Bioterrorism remains a certain threat both from domestic and international terrorist groups. From a public health point of view, time to time surveillance, awareness of syndromes resulting from bioterrorism, epidemiologic investigation capacity, laboratory diagnostic capacity and the ability to rapidly communicate critical information on a need to know basis to manage public communication through the media are vital. Ensuring adequate supply of drugs and medicines, laboratory reagents, antitoxins and vaccines is essential. Formulating and putting into practice standard operating procedures/drills at all levels of health care will go a long way in minimizing mortality and morbidity in case of a bioterrorist attack.

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