

Bioterrorism – Category A Agents



Bioterrorism: Definition and Goal

Definition

Intentional use, or threatened use, of microorganisms or biological toxins to produce death or disease in humans, animals, or plants.

Goal

Goal is to harm large numbers of people (or animals or plants) and/or to intimidate a government to accomplish political, social, and/or religious objectives.

Advantages of Biological Agents as Weapons

- Substantial number of possible agents.
 - Category A agents
 - Highest priority agents with potential to cause very significant morbidity/mortality and social disruption.
 - Include anthrax, smallpox, plague, botulism
 - Category B agents
 - Second highest priority agents
 - Include brucellosis, ricin, Q fever
 - Category C agents
 - Emerging pathogens. Could be engineered for mass dissemination in the future.
 - Include nipah virus, hantavirus
- Could cause substantial morbidity/mortality.
- Could be disseminated over a large area and affect many persons.

Advantages of Biological Agents as Weapons

- Difficult to detect a covert release.
- Some bioterrorism agents can be transmitted from person to person, leading to additional cases.

Person-To-Person Transmission Potential of Category A Bioterrorism Agents

| Disease | Person-To-Person Transmission |
|------------------------|---|
| Anthrax (Inhalational) | No |
| Botulism | No |
| Plague (Pneumonic) | Yes (respiratory droplets) |
| Smallpox | Yes (respiratory droplets, fine-particle aerosols, material from pustules or crusted scabs) |
| Tularemia | No |
| VHFs | Yes (through close contact with infected people or their body fluids, including through fomites; airborne transmission is rare but may occur) |

Advantages of Biological Agents as Weapons

- Because of the incubation period, symptom onset is days or weeks after the event.

Incubation Periods for Category A Bioterrorism Agents

| <u>Disease</u> | <u>Incubation Period</u> |
|----------------|--|
| Anthrax | Usually 1-7 days (4-6 days in 2001 attacks). May be up to 60 days; theoretically longer. |
| Botulism | For foodborne botulism: 2 hrs to 8 days (typically 12-72 hours). Incubation period for inhalational botulism is unclear. |
| Plague | Typically 2-4 days (range 1-6 days). |
| Smallpox | Typically 12-14 days (range 7- 19 days). |
| Tularemia | Typically 3-5 days (range 1-14 days). |
| VHFs | Range 2-21 days (varies according to agent). |

- Victims can disperse widely before the event is recognized.
- The exact time, place, and nature of the event may, at least initially, be difficult to determine.

Advantages of Biological Agents as Weapons

- Perpetrators may be able to escape and/or protect themselves with vaccine or prophylactic antibiotics.
- A bioterrorist attack can cause panic and social disruption, overwhelm response systems, have huge economic impacts, etc. – i.e., bioterrorism can be much more than just killing people.



Advantages of Biological Agents as Weapons

- Because of advancing biotechnology, and the availability of well-trained scientists and technicians, it is becoming more likely that non-government-sponsored terrorist groups can develop and effectively utilize “weapons-grade” biological agents against civilian populations.

Dissemination of Biological Agents

- Aerosol dissemination
 - Easiest and most efficient way to disperse a biological agent if the proper expertise and technology is available.
 - Potential to expose very large numbers of persons.
 - Challenges exist in producing aerosol particles with the proper characteristics.
 - Challenges also exist with disseminating the aerosol so as to infect significant numbers of individuals.
- Food/Waterborne dissemination
 - Could potentially expose large numbers of persons.
 - But only effective for some agents.
 - Technical difficulties, especially with contaminating a public water system.
- Person-to-person transmission dissemination
 - Less efficient than aerosol for infecting a large population.

Recognition of a Bioterrorism Attack

- Detection of a Bioterrorism Attack: Key Points
 - An attack might be recognized through:
 - Passive surveillance
 - Active surveillance
 - Syndromic surveillance
 - Environmental sensors (BioWatch Program)
 - Reports from the general public or media
 - Recognition and immediate reporting by a medical provider (e.g., physician, infection control practitioner, school nurse), of:
 - a disease outbreak, or a case (or cases) of disease with an unusual epidemiologic pattern
 - the presence of an unusual illness that suggests a possible terrorist attack

Recognition of a Bioterrorism Attack

- Detection of a Bioterrorism Attack: Key Points
 - Medical providers do need to be able to recognize potential terrorist-associated diseases in their patients based on the presence of:
 - a) epidemiologic patterns, and/or
 - b) one or more cases of an illness with unusual characteristics
 - Providers do not have to have detailed knowledge of all of the many possible bioterrorism-associated diseases.
 - Providers do not have to be able to make an immediate definitive diagnosis if an unusual disease outbreak begins, or if one or more persons present with an unusual set of signs/symptoms but,
 - Providers do need to be able to make prompt decisions regarding initial management and disposition (including the need for isolation, further medical evaluation, etc).

Recognition of a Bioterrorism Attack

- Detection of a Bioterrorism Attack: Key Points
 - Of special importance is the need to quickly report any suspicious illness, or any indication of an illness outbreak, to public health officials, either:
 - a) the Local Public Health Agency (LPHA), or
 - b) the Missouri Dept of Health & Senior Services
 - Department Situation Room (DSR)
 - **800/392-0272 (24/7)**

Recognition of a Bioterrorism Attack

- Detection of a Bioterrorism Attack: Key Points
 - Most diseases caused by potential bioterrorism agents initially present with a nonspecific or flu-like illness (e.g., fever, malaise, cough, perhaps GI symptoms).

Initial Signs/Symptoms of 5 Category A Bioterrorism Agents and Influenza

| | Fever | Chills | Malaise or Fatigue | Myalgia | Headache | Cough | GI Symptoms |
|-----------|-------|--------|--------------------|---------|----------|-------|-------------|
| Anthrax | X | X | X | X | X | X | X |
| Plague | X | X | X | X | X | X | |
| Smallpox | X | X | X | | X | | X |
| Tularemia | X | | X | | X | X | |
| VHFs | X | X | X | X | X | X | X |
| Influenza | X | X | X | X | X | X | X |

Recognition of **Category A** Bioterrorist Agents

- In general, each of the major diseases caused by the six Category A bioterrorism agents would present as one of the following illness syndromes:
 - a. Respiratory or flu-like Syndrome
 - Inhalational Anthrax
 - Pneumonic Plague
 - Pneumonic Tularemia
 - b. Cutaneous Ulcer or Ulceroglandular Syndrome
 - Cutaneous Anthrax
 - c. Fever and Rash Syndrome
 - Smallpox
 - Viral Hemorrhagic Fevers
 - d. Paralytic Syndrome
 - Botulism

Recognition of Category A Bioterrorist Agents

Anthrax (Inhalational)

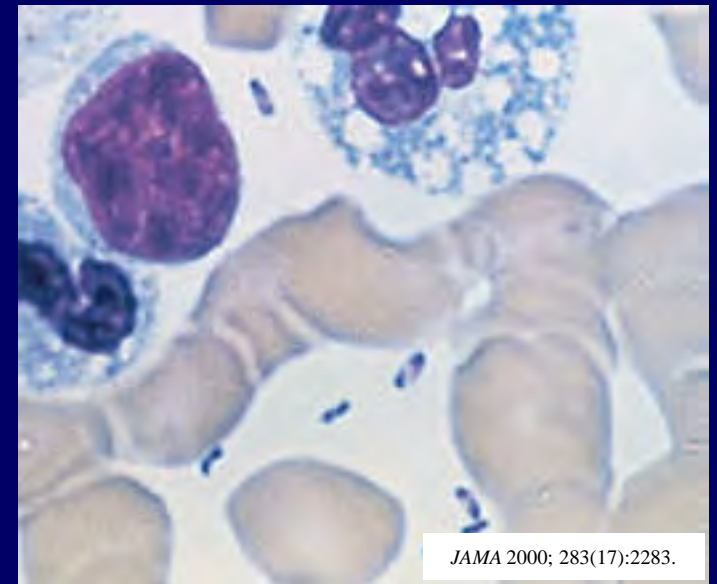
- Initial phase with non-specific, febrile flu-like signs and symptoms for 1-5 days.
- Subsequent, fulminant phase with high fever and severe respiratory distress, shock, death.
- Hemorrhagic meningitis can be present.
- On CXR may see mediastinal widening and/or pleural effusion; infiltrates might be present.
- Large, gram-positive bacilli in blood or CSF



Recognition of Category A Bioterrorist Agents

Plague (Pneumonic)

- Febrile flu-like signs and symptoms, and then rapidly developing severe pneumonia.
- Cough can be productive of bloody sputum.
- Prominent GI symptoms can occur.
- CXR findings are variable but bilateral infiltrates or consolidation are common; pleural effusions may be present.
- Gram-negative bacilli or coccobacilli in sputum, bronchial washings, and/or blood; Wright, Giemsa, or Wayson stain will often show bipolar staining.



Recognition of **Category A** Bioterrorist Agents

Tularemia (Pneumonic)

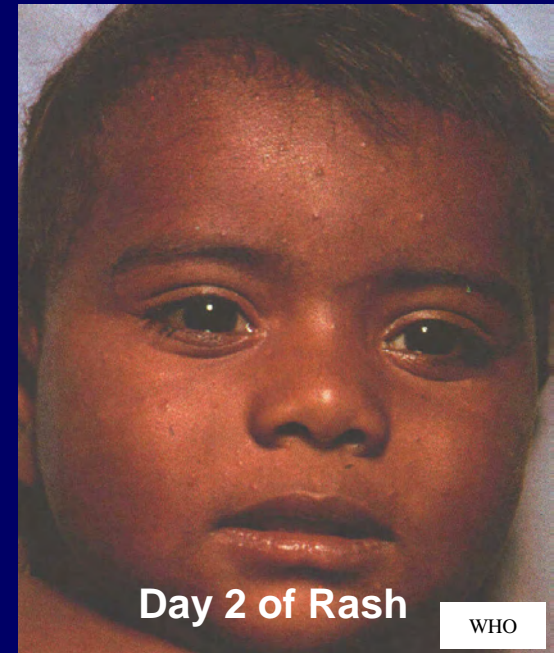
- Febrile flu-like signs and symptoms.
- Pneumonia can develop but inhalational exposures can commonly result in an initial picture of systemic illness without prominent respiratory signs/symptoms.
- Can see peribronchial infiltrates, advancing to bronchopneumonia in >1 lobes, often accompanied by pleural effusions and hilar lymphadenopathy (but such signs may be minimal or absent).
- Small Gram-negative coccobacilli in respiratory secretions.



Recognition of **Category A** Bioterrorist Agents

Smallpox

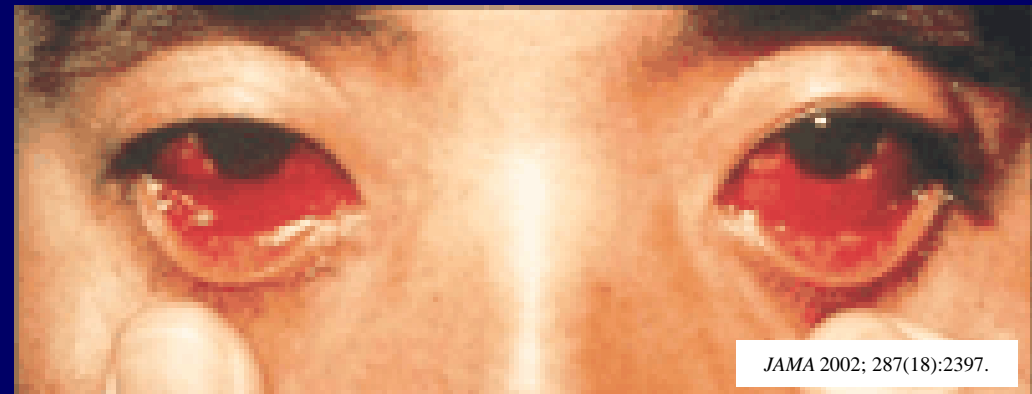
- **Prodrome: Severe febrile flu-like signs and symptoms lasting 2-4 days.**
- **Eruptive stage: Starts with an enanthem, followed in about 24 hours by an increasingly characteristic rash (macules → papules → vesicles → pustules → crusts).**
- **Pustules raised, round, firm, deeply embedded in the skin; lesions on any one part of the body are in the same stage of development; centrifugal distribution; lesions can be seen on the palms and soles.**



Recognition of **Category A** Bioterrorist Agents

Viral Hemorrhagic Fevers (e.g., Ebola, Lassa Fever)

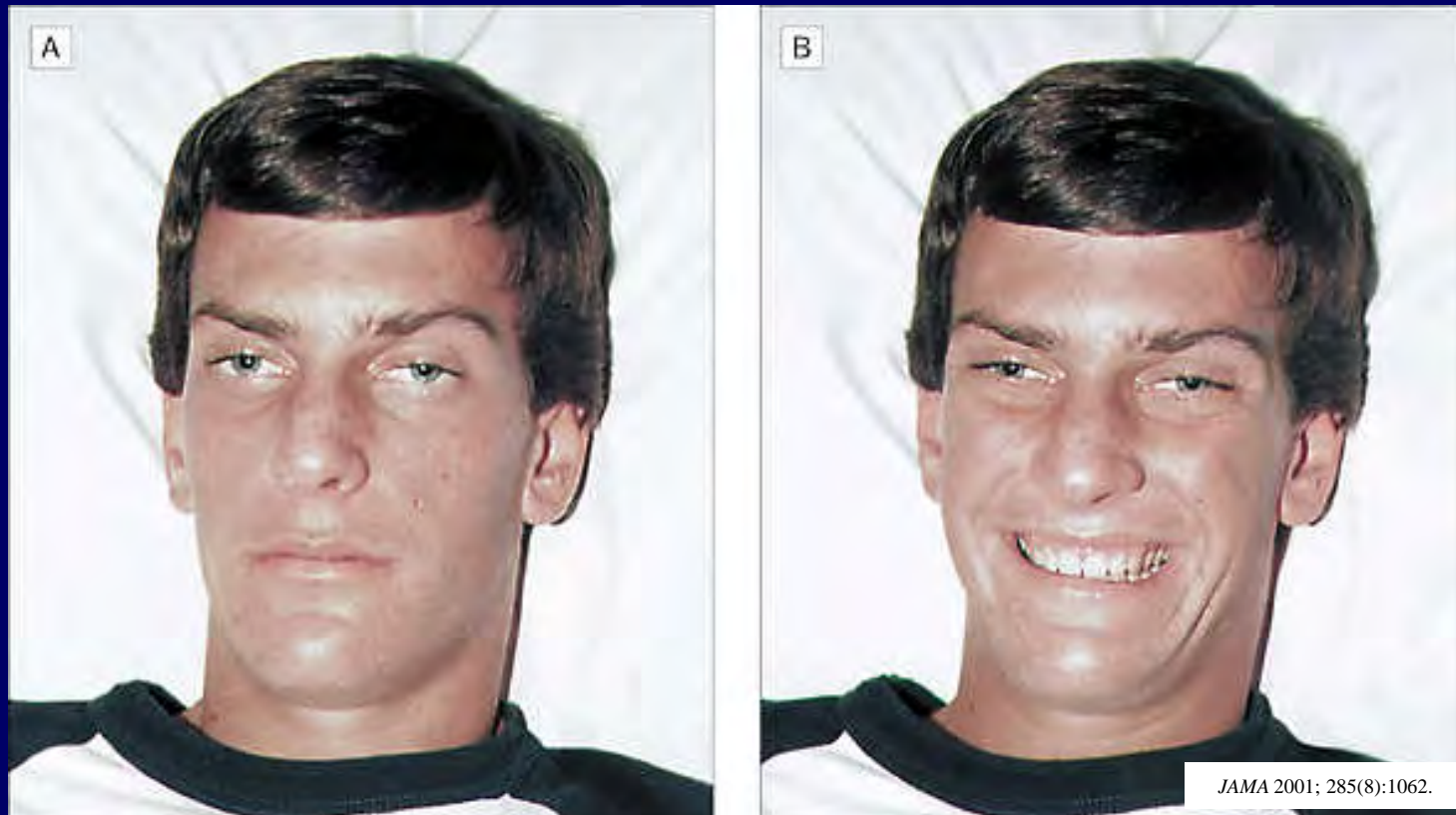
- Prodromal febrile flu-like illness.
- Early signs can also include hypotension, relative bradycardia, tachypnea, conjunctivitis, and pharyngitis.
- Most VHF's are associated with cutaneous flushing or a skin rash.
- Later, patients may show signs of a progressive hemorrhagic diathesis, with petechiae, mucous membrane and conjunctival hemorrhage, hematuria, hematemesis, or melena. DIC and shock may ensue.



Recognition of **Category A** Bioterrorist Agents

Botulism

- Afebrile, symmetric, descending flaccid paralysis of motor and autonomic nerves, beginning with the cranial nerves.
- Dry mouth, "blurred vision", and diplopia, which may be followed by dysphonia, dysarthria, dysphagia, and peripheral-muscle weakness.



Bioterrorism Resources for Medical and Public Health Professionals

Missouri Department of Health & Senior Services
Center for Emergency Response/Terrorism

<http://www.dhss.mo.gov>

Click on: Emergency/Terrorism Response"



Matt Blunt, Governor
Julia M. Eckstein, Director

State of Missouri DEPARTMENT OF HEALTH AND SENIOR SERVICES

Site Search

DHSS Home >> Missouri Dept of Health and Senior Services

- ▣ Topics A-Z
- ▣ About DHSS
- ▣ Frequently Asked Questions
- ▣ Legislation Tracking
- ▣ State Public Health Laboratory
- ▣ Local Public Health Agencies & Services
- ▣ Area Agencies on Aging & Services
- ▣ Birth, Death, Marriage & Divorce Information
- ▣ Services for Health Professionals



HOT TOPICS:

[Pandemic Influenza](#) | [Healthy Missourians Initiative: Preventing Obesity](#) | [Emergency/Terrorism Response](#) | [Birth Certificates and Other Records](#)

What's New:

Missouri weather is turning colder. Learn more about protecting yourself against hypothermia.



Health

Welcome to the **Missouri Department of Health and Senior Services Website.** Visit one of the topics to learn more about what we have to offer.



Senior Services





Missouri Department of Health and Senior Services Emergency Response and Terrorism

Report Suspected Biological, Chemical or Radiological Terrorism Events by Calling **1-800-392-0272** (24 hours a day - 7 days a week)

Site Search

DHSS Home >> Emergency Response and Terrorism



READY IN 3:
Educational Materials For Emergency Response

Questions? Ask Us.

Biological Threat
[For The General Public](#)
[For Medical Professionals](#)

Chemical Threat
[For The General Public](#)
[For Medical Professionals](#)

Radiological/Nuclear Threat
[For The General Public](#)
[For Medical Professionals](#)

Natural Disaster
Mass Trauma

Children and Disaster Terrorism

Disaster Mental Health

How to Recognize and Handle a Suspicious Package

Missouri Hospitals

CURRENT MISSOURI THREAT LEVEL

ELEVATED
SIGNIFICANT RISK OF TERRORIST ATTACKS

HOMELAND SECURITY ADVISORY SYSTEM

LATEST NEWS & ALERTS

[Unvaccinated Infant - Minnesota, October, 2005 \(October 7, 2005\)](#)

MORE RESOURCES

- [Public Information Toolkit for Local Public Health Agencies](#)
- [Laboratory Information](#)
- [Emergency Response Planning](#)
- [Potential High Impact Diseases](#)
- [Speaker's Bureau](#)

News & Events:

- 1.03.06 [Public Health Preparedness and Response UPDATE](#)
- 11.15.05 [DHSS Pandemic Influenza Website](#)
- 10.11.05 [Missouri Veterinary Emergency Awareness Manual](#)

Health Alert Network Information:

- 11.15.05 [Health Advisory - Avian Influenza and the Threat of an Influenza Pandemic](#)
- 10.7.05 [Health Advisory - Polio Infection in an Unvaccinated Infant - Minnesota, October, 2005](#)
- 10.5.05 [Health Advisory - FDA and CDC Issue Alert on Menactra Meningococcal Vaccine and Guillain Barre Syndrome](#)

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Site Search

DHSS Home >> Emergency Response and Terrorism

Pandemic Influenza

Information From The Missouri Dept. of Health and Senior Services on Human Pandemic Influenza and Avian Influenza

General Information

[Missouri Pandemic Planning Summit, February 23, 2006 \(2.23.06\)](#)

[Action Steps Persons Can Take to Prepare for a Possible Influenza Pandemic \(11.08.05\)](#)

[Recommendations on Personal Stockpiling of Influenza Antiviral Medications \(11.08.05\)](#)

Health Alerts, Advisories, Updates, Guidances

(For Medical and Public Health Professionals)

[Health Advisory - New Interim Recommendations for Treatment and Prophylaxis of Influenza \(1.17.06\)](#)

[Health Advisory - Avian Influenza and the Threat of an Influenza Pandemic \(11.15.05\)](#)

Recommendations and Other Information

(For Medical and Public Health Professionals)

[Influenza A \(H5N1\): Indications for Testing and Infection Control Precautions \(11.08.05\)](#)

[Case Detection and Clinical Management During the Interpandemic and Pandemic Alert Periods \(11.08.05\)](#)

Pandemic Influenza: Current Situation

[Avian Influenza Outbreaks \(CDC\)](#)

[Influenza Pandemic Threat: Current Situation \(WHO\)](#)

Seasonal (Non-Pandemic) Influenza: Current Situation

[Weekly Influenza Report \(DHSS\)](#)

[Flu Activity \(CDC\)](#)

[Q&A: Vaccine Supply and Prioritization Recommendations \(CDC\)](#)

Information For:

Medical Professionals

General Public

Pandemic Influenza Preparedness Committee

Businesses

Faith-Based & Community Organizations

Health Care Facilities and Services

Schools

State/Local Governments

Pandemic Influenza Plans:

Missouri Pandemic Influenza Plan - Version 2.0

US Dept of Health and Human Services Plan

Websites:

Pandemic, Avian, and Seasonal Influenza Websites