Biological Attack

WHAT IS IT?

A biological attack is the intentional release of a pathogen (disease-causing agent) or biotoxin (poisonous substance produced by a living organism) against humans, plants, or animals. An attack against people could be used to cause illness, death, public societal disruption, and economic damage. An attack on agricultural plants and animals would primarily cause economic damage, and smallpox has the potential for local spread and possible loss of life. It is useful to distinguish between two kinds of biological agents:

- Transmissible agents that spread from person to person (e.g., smallpox, Ebola or avian influenza disease include bacteria, viruses, prions, or other agents). Agents that may cause adverse effects in exposed individuals for a short time and not make those individuals contagious to others (e.g., anthrax, tularemia toxins).

Availability of Agents

The Centers for Disease Control and Prevention (CDC) lists the biological attack threat agents considered to pose the greatest threat to the United States until as recently as the 1990s.

For an attack on people, bacteria or virions might be disseminated in one or more of the following ways:

- Aerosol dissemination
- Spraying or spraying agents onto people
- Direct contact with contaminated materials
- Ingestion, e.g., by consuming contaminated water
- Smallpox virus
- Anthrax
- Typhus fever
- Smallpox
- Plague
- Botulism
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In the 1340s, Europeans threw plague-infected Allies livestock with anthrax from voting in an election. Shree Rajneesh sickened 751 people in a chemical attack with Sarin nerve agent. U.S. mail infected 11 people with inhalation anthrax.

### Biological Attack

**Historical Perspective on Biological Weapons**

At the 1995 nerve agent disaster in Malaysia, Japan’s cult Aum Shinrikyo failed with lewisite and various other bioweapons. A number of naturally infected or experimentally incapacitated animals in the American biological.toxins database, a biological attack will probably first be detected by local health care workers observing a pattern of unusual infections or early warning monitoring systems that detect latent pathogens. Evidence of an attack may appear in animals before humans.

#### The Area Affected

For an arsensical release, the area affected would depend on the quantity of agent released, whether the release is indoors or outdoors, and weather conditions. Agents released outdoors would disperse swiftly in the direction of the prevailing wind and could degrade with solar, wind, and rain. Aerobiological analysis can identify and determine the location of a biological attack capability or biological weapons. Pathogens indirectly, an individual can become infected if the agent is inhaled, ingested, or through skin contact.

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### Infectious Disease Spread

- **Bacteria**: Spread through contact with infected body fluids or soil. Inhaled or ingested bacteria can cause infections, such as pneumonia or blood poisoning.
- **Viruses**: Spread through airborne droplets, saliva, or contaminated objects. Examples include influenza, measles, and COVID-19.
- **Fungi**: Spread through inhalation or contact with soil, water, or contaminated objects. Examples include mold and fungal infections.
- **Parasites**: Spread through insect bites, ingestion of contaminated foods, or direct contact with infected animals. Examples include malaria and hookworm.

### Disease Transmission Methods

- **Respiratory**: Inhaled particles cause infections in the respiratory system, such as pneumonia.
- **Gastrointestinal**: Through ingestion of contaminated food or water, causing diseases like diarrhea.
- **Insect-borne**: Transmitted through insect vectors like mosquitoes or ticks, causing diseases like dengue or Lyme disease.
- **Direct Contact**: Spread through physical contact, such as skin-to-skin contact or shared objects, causing infections like HIV.

### Medical Treatment

- **Antimicrobial**: Treat infections caused by bacteria with antibiotics.
- **Antiviral**: Treat infections caused by viruses with antiviral medications.
- **Antifungal**: Treat infections caused by fungi with antifungal drugs.
- **Antiparasitic**: Treat infections caused by parasites with antiparasitic medications.

### What Do People Do to Protect Themselves?

#### Practical Steps

- **Avoid Close Contact**: Keep a distance of at least 6 feet from people who have symptoms of a contagious disease.
- **Wash Your Hands**: Regular handwashing with soap and water or using hand sanitizer can help prevent spread.
- **Cover Coughs and Sneezes**: Use a tissue or your sleeve to cover your mouth and nose when coughing or sneezing.
- **Disinfect Surfaces**: Clean and disinfect frequently touched objects and surfaces.
- **Stay Home When Sick**: If you are sick, stay home to avoid spreading the disease to others.

### Conclusion

Understanding the biology of infectious diseases, how they spread, and how to protect ourselves is crucial for maintaining public health. By following these guidelines, we can minimize the risk of disease transmission and protect vulnerable populations, especially those with weakened immune systems.
The Australia Group is a loose association of countries that have agreed not to develop, produce, stockpile, or retain biological and toxin weapons or assist other States in developing, producing, or retaining such weapons. It forbids States from developing, producing, or retaining biological and toxin weapons. It also encourages cooperation between States on the matter of biological and toxin weapons.

In the 1990s, the cult of Aum Shinrikyo failed to use biological weapons against its enemies, and instead released sarin nerve agent gas into a Tokyo subway. In 2001, the anthrax attacks through the U.S. mail infected 11 people with inhalation anthrax, and 22 people died of anthrax sepsis or anthrax meningitis.

In the 1340s, Europeans threw plague-infected corpses into the ocean to isolate themselves from the spread of the disease. In 2001, the anthrax attacks through the U.S. mail infected 11 people with inhalation anthrax, and 22 people died of anthrax sepsis or anthrax meningitis.

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<tr>
<td>Anthrax (Bacillus anthracis)</td>
<td>1–7 days</td>
<td>Fever, cough, shortness of breath, pneumonia</td>
<td>Moderate</td>
<td>High if untreated</td>
<td>tripotent vaccine</td>
<td>Antibiotics</td>
</tr>
<tr>
<td>Plague (Yersinia pestis)</td>
<td>3–5 days</td>
<td>High fever, headache, chills, vomiting, chest pain, muscle pain, inflammation of lymph nodes</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>None</td>
</tr>
<tr>
<td>Tularemia (Francisella tularensis)</td>
<td>1–14 days</td>
<td>Fever, headache, muscle pain, swollen lymph nodes</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>Antibiotics</td>
</tr>
<tr>
<td>Smallpox (Varicella zoster virus)</td>
<td>12 days</td>
<td>Rash, fever, vomiting, lymphadenopathy</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>None</td>
</tr>
<tr>
<td>Marburg (Marburg virus)</td>
<td>4–21 days</td>
<td>Sudden onset, fever, headache, muscle pain, vomiting</td>
<td>Moderate</td>
<td>Relatively unstable</td>
<td>no vaccine or treatment</td>
<td>Supportive treatment only</td>
</tr>
<tr>
<td>Ebola (Marburg virus)</td>
<td>2–4 days</td>
<td>Fever, vomiting, abdominal pain, diarrhea, rash</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>Supportive treatment only</td>
</tr>
<tr>
<td>Q fever (Coxiella burnetii)</td>
<td>1–14 days</td>
<td>Pneumonia with or without blood poisoning</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>None</td>
</tr>
<tr>
<td>Typhus (Rickettsia prowazekii)</td>
<td>3–5 days</td>
<td>Fever, headache, backache, rash, pneumonia</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>None</td>
</tr>
<tr>
<td>Typhoid fever (Salmonella typhi)</td>
<td>6–16 days</td>
<td>High fever, headache, body pain, rash, mild diarrhea</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>None</td>
</tr>
</tbody>
</table>

**WHAT SHOULD PEOPLE DO TO PROTECT THEMSELVES?**

**Table 3: Health Impacts, and Treatments for Some Agents of Concern**

<table>
<thead>
<tr>
<th>Agent</th>
<th>Incubation Period</th>
<th>Symptoms</th>
<th>Lethality</th>
<th>Persistence of Symptoms</th>
<th>Vaccine Status (as of March 2005)</th>
<th>Medical Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax (Bacillus anthracis)</td>
<td>1–7 days</td>
<td>Fever, cough, shortness of breath, pneumonia</td>
<td>Moderate</td>
<td>High if untreated</td>
<td>tripotent vaccine</td>
<td>Antibiotics</td>
</tr>
<tr>
<td>Plague (Yersinia pestis)</td>
<td>3–5 days</td>
<td>High fever, headache, chills, vomiting, chest pain, muscle pain, inflammation of lymph nodes</td>
<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
<td>None</td>
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<tr>
<td>Tularemia (Francisella tularensis)</td>
<td>1–14 days</td>
<td>Fever, headache, muscle pain, swollen lymph nodes</td>
<td>Very high</td>
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<td>Antibiotics</td>
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<tr>
<td>Smallpox (Varicella zoster virus)</td>
<td>12 days</td>
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<tr>
<td>Marburg (Marburg virus)</td>
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<td>Very high</td>
<td>Very high</td>
<td>no vaccine or treatment</td>
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</tbody>
</table>
**Table 2. Disease, Health Impacts, and Treatments for Some Agents of Concern**

<table>
<thead>
<tr>
<th>Disease (agent)</th>
<th>Introduction pathway</th>
<th>Symptoms</th>
<th>Lethality if untreated</th>
<th>Persistence of Organism</th>
<th>Vaccine Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax (Bacillus anthracis)</td>
<td>Inhalation, primary exposure</td>
<td>Small papule or nodule, followed by ulceration, necrosis, and constitutional symptoms</td>
<td>No</td>
<td>Yes</td>
<td>Licensed</td>
</tr>
<tr>
<td>Plague (Yersinia pestis)</td>
<td>Inhalation, secondary exposure</td>
<td>High fever, chills, headache, cough, vomiting, congestion, and/or shock</td>
<td>Yes</td>
<td>No</td>
<td>Licensed</td>
</tr>
<tr>
<td>Tularemia (Francisella tularensis)</td>
<td>Inhalation, secondary exposure</td>
<td>Fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
<td>No</td>
<td>Yes</td>
<td>Licensed</td>
</tr>
<tr>
<td>Plague (Yersinia pestis)</td>
<td>Secondary contact exposure</td>
<td>High fever, sudden onset of rash, chills, and headache</td>
<td>Yes</td>
<td>No</td>
<td>Licensed</td>
</tr>
<tr>
<td>Tularemia (Francisella tularensis)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
<td>No</td>
<td>Yes</td>
<td>Licensed</td>
</tr>
<tr>
<td>Vaccine (Francisella tularensis)</td>
<td>Vaccination</td>
<td>No side effects</td>
<td>Yes</td>
<td>No</td>
<td>Licensed</td>
</tr>
<tr>
<td>Marburg (Marburg virus)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
<td>No</td>
<td>Yes</td>
<td>Licensed</td>
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<tr>
<td>Plague (Yersinia pestis)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
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<td>Yes</td>
<td>Licensed</td>
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<tr>
<td>Tularemia (Francisella tularensis)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
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<td>Yes</td>
<td>Licensed</td>
</tr>
<tr>
<td>Vaccine (Francisella tularensis)</td>
<td>Vaccination</td>
<td>No side effects</td>
<td>Yes</td>
<td>No</td>
<td>Licensed</td>
</tr>
<tr>
<td>Smallpox (Variola major)</td>
<td>Contact exposure</td>
<td>High fever, headache, rash, and/or pharyngitis</td>
<td>Yes</td>
<td>No</td>
<td>Not licensed</td>
</tr>
<tr>
<td>Marburg (Marburg virus)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
<td>No</td>
<td>Yes</td>
<td>Licensed</td>
</tr>
<tr>
<td>Plague (Yersinia pestis)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Tularemia (Francisella tularensis)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
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<td>Yes</td>
<td>Licensed</td>
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<tr>
<td>Vaccine (Francisella tularensis)</td>
<td>Vaccination</td>
<td>No side effects</td>
<td>Yes</td>
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<td>Smallpox (Variola major)</td>
<td>Contact exposure</td>
<td>High fever, headache, rash, and/or pharyngitis</td>
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<td>Marburg (Marburg virus)</td>
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<td>Tularemia (Francisella tularensis)</td>
<td>Secondary contact exposure</td>
<td>High fever, cough, pharyngitis, headache, and/or conjunctivitis</td>
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<td>Vaccine (Francisella tularensis)</td>
<td>Vaccination</td>
<td>No side effects</td>
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<td>Smallpox (Variola major)</td>
<td>Contact exposure</td>
<td>High fever, headache, rash, and/or pharyngitis</td>
<td>Yes</td>
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<td>Licensed</td>
</tr>
</tbody>
</table>

**WHAT IS THE DANGER?**

Impact on Human Health

Biological agents have the potential to: produce a life-threatening illness; constitute an unnecessary and large-scale public health crisis; incapacitate or destroy the economic or agricultural infrastructure; or generate a psychological wasteland. The threat is real and a biological attack is possible.

**WHAT SHOULD PEOPLE DO TO PROTECT THEMSELVES?**

Practical Steps

During a declared biological emergency:

1. Stay in the group or area that authorities have linked to exposure who have symptoms that match those described should seek emergency medical attention.

**Intoxication Not Due to Contagious Disease**

The terms “intoxication” and “poisoning” are often used interchangeably to refer to situations where persons are exposed to a number of different agents or organisms intended to cause harm to a large number of people. The terms may be used instead of the more specific terms, but in actual use the two terms refer to different conditions. For example, if a person is affected by direct contact with a toxic agent, such as a chemical or biological material, the condition is appropriately referred to as “intoxication.” However, if a person ingested a food or water that has been deliberately contaminated with a pathogen or toxin, the condition is appropriately referred to as “poisoning.” It is important to understand the distinction between these two terms, as the treatment is likely to be different.

In this document, the term “intoxication” is used to refer to situations where persons have been exposed to a toxic agent such as a chemical or biological material. The term “poisoning” is used to refer to situations where persons have been exposed to a pathogen or toxin such as a chemical or biological material.
A biological attack is the intentional release of a pathogen (disease- causing agent) or toxin (poison) in a quantity sufficient to produce widespread human illness or death. Although the economic impact of a biological attack cannot be accurately calculated, the estimated economic losses are in the trillions of dollars. The average cost per death is estimated to be $5 million, or $300 billion for all deaths. The high cost of biological attacks is primarily due to the high costs of medical care and lost income, but also includes the costs of recovery and cleanup. Economic losses would be even greater if a biological attack were to occur during the fall and winter months when the economy is already weak.

The economic impact of an agricultural attack would be substantial. The estimated economic losses for a severe agricultural attack are in the trillions of dollars, with the average cost per death estimated to be $300 billion. The high cost of agricultural attacks is primarily due to the high cost of medical care and lost income, but also includes the costs of recovery and cleanup. Economic losses would be even greater if an agricultural attack were to occur during the fall and winter months when the economy is already weak.

The economic impact of a biological attack on the food supply would be substantial. The estimated economic losses for a severe biological attack on the food supply are in the trillions of dollars, with the average cost per death estimated to be $300 billion. The high cost of biological attacks on the food supply is primarily due to the high cost of medical care and lost income, but also includes the costs of recovery and cleanup. Economic losses would be even greater if a biological attack were to occur during the fall and winter months when the economy is already weak.

BIOLOGICAL ATTACK
HUMAN PATHOGENS, BIOLOGICAL ATTACKS, AND AGRICULTURAL THREATS

WHAT IS IT?
A biological attack is the intentional release of a pathogen (disease-causing agent) or toxin (poison) in a quantity sufficient to produce widespread human illness or death. Although the economic impact of a biological attack cannot be accurately calculated, the estimated economic losses are in the trillions of dollars. The average cost per death is estimated to be $5 million, or $300 billion for all deaths. The high cost of biological attacks is primarily due to the high costs of medical care and lost income, but also includes the costs of recovery and cleanup. Economic losses would be even greater if a biological attack were to occur during the fall and winter months when the economy is already weak.

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The economic impact of a biological attack on the food supply would be substantial. The estimated economic losses for a severe biological attack on the food supply are in the trillions of dollars, with the average cost per death estimated to be $300 billion. The high cost of biological attacks on the food supply is primarily due to the high cost of medical care and lost income, but also includes the costs of recovery and cleanup. Economic losses would be even greater if a biological attack were to occur during the fall and winter months when the economy is already weak.
A biological attack is the intentional release of a pathogen (disease-causing agent) or biotoxin (poisonous substance produced by a living organism) against humans, plants, or animals. An attack against people could be used to cause illness, death, public societal disruption, and economic damage. An attack on agricultural plants and animals would primarily cause economic damage such as total crop failure, or possible loss of life. It is useful to distinguish between two kinds of biological agents:

- Transmissible agents that spread from person to person (e.g., smallpox, Ebola disease or animal disease such as foot-and-mouth disease)
- Agents that may cause adverse effects in exposed individuals but that may not make those individuals contagious to others (e.g., anthrax, biolimit toxins).

Availability of Agents

The Centers for Disease Control and Prevention (CDC) lists the bioattack agents considered to pose the highest threat (see Table 1). Once obtained, agents must be cultured or grown in vitro and then processed for use in an attack (“weaponized”). Agents can be:

- Isolated from sources in nature (e.g., smallpox, anthrax, Q fever, tularemia)
- Acquired from laboratories or bioweapons stockpile
- Synthesized or genetically manipulated in a laboratory
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Biological Attack Human Pathogens, Biotoxins, and Agricultural Threats

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