



Recognizing the Threat of Bioterrorism

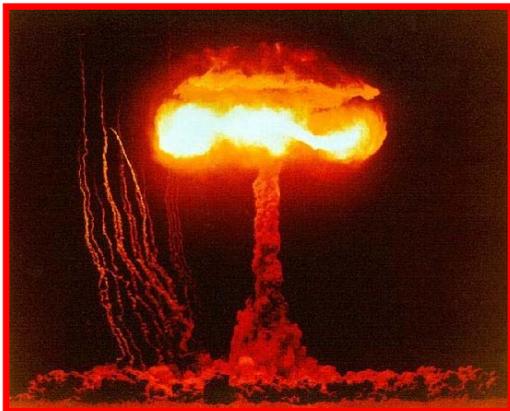
**USF Center for Biological
Defense**

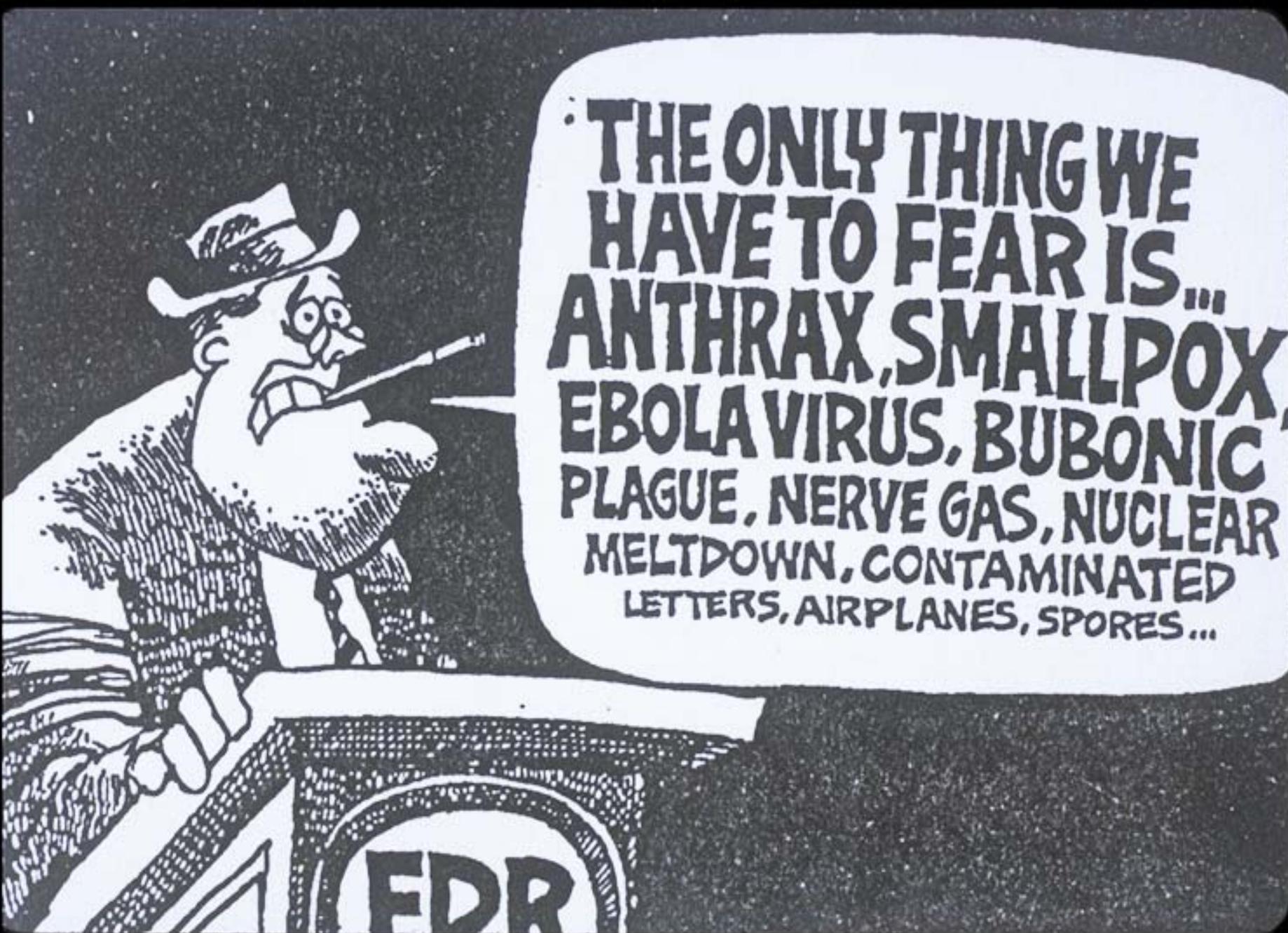
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Types of Terrorism

- Chemical
- Biological***
- Radiological or “Dirty – Bomb”
- Nuclear
- Explosive





**THE ONLY THING WE
HAVE TO FEAR IS...
ANTHRAX, SMALLPOX,
EBOLA VIRUS, BUBONIC
PLAGUE, NERVE GAS, NUCLEAR
MELTDOWN, CONTAMINATED
LETTERS, AIRPLANES, SPORES...**

EDR

Bioterrorism

- The application of biologic agents or their toxins as a weapon against *people, animals or crops*.
- Most confirmed cases have involved **biocrimes** rather than bioterrorism or biowarfare.

Category A Agents

- **Anthrax (*Bacillus anthracis*)**
- **Botulism (*Clostridium botulinum* toxin)**
- **Plague (*Yersinia pestis*)**
- **Smallpox (*Variola major*)**
- **Tularemia (*Francisella tularensis*)**
- **Viral Hemorrhagic Fevers (Filoviruses [e.g., Ebola, Marburg] and Arenaviruses [e.g., Lassa, Machupo])**



Category B Agents

- **Brucellosis** (*Brucella* species)
- Epsilon toxin of *Clostridium perfringens*
- Food safety threats (e.g., **Salmonella** species, **Escherichia coli** O157:H7, *Shigella*)
- Glanders (*Burkholderia mallei*)
- Melioidosis (*Burkholderia pseudomallei*)
- Psittacosis (*Chlamydia psittaci*)
- Q fever (*Coxiella burnetii*)
- **Ricin** toxin from *Ricinus communis* (castor beans)
- Staphylococcal enterotoxin B
- Typhus fever (*Rickettsia prowazekii*)
- **Viral encephalitis** (alphaviruses [e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis])
- Water safety threats (e.g., *Vibrio cholerae*, **Cryptosporidium** parvum)



Category C Agents

- **Emerging infectious disease threats such as:**
 - **Nipah Virus**
 - **Hanta Virus**
 - **SARS**
 - **Avian Flu (H5N1)**
 - **Swine Flu (H1N1)**
 - **West Nile Virus**
 - **Genetically Engineered Threats**



Why Use Biological Agents?

- **Cheap, Relatively Simple Propagation**
- Infectious via aerosol
- Organisms fairly stable in environment
- Susceptible civilian populations
- The guilty can escape to “fight another day”
- High morbidity and mortality
- Person-to-person transmission (smallpox, plague, VHF)
- Difficult to diagnose and/or treat
- Enormously disruptive and costly
- Wide range of biological agents



Possible Delivery Systems

1. Point Source Delivery

2. Upwind line delivery (eg. Crop Duster)
3. Vector transmission
4. Human Carrier – “Outbreak”



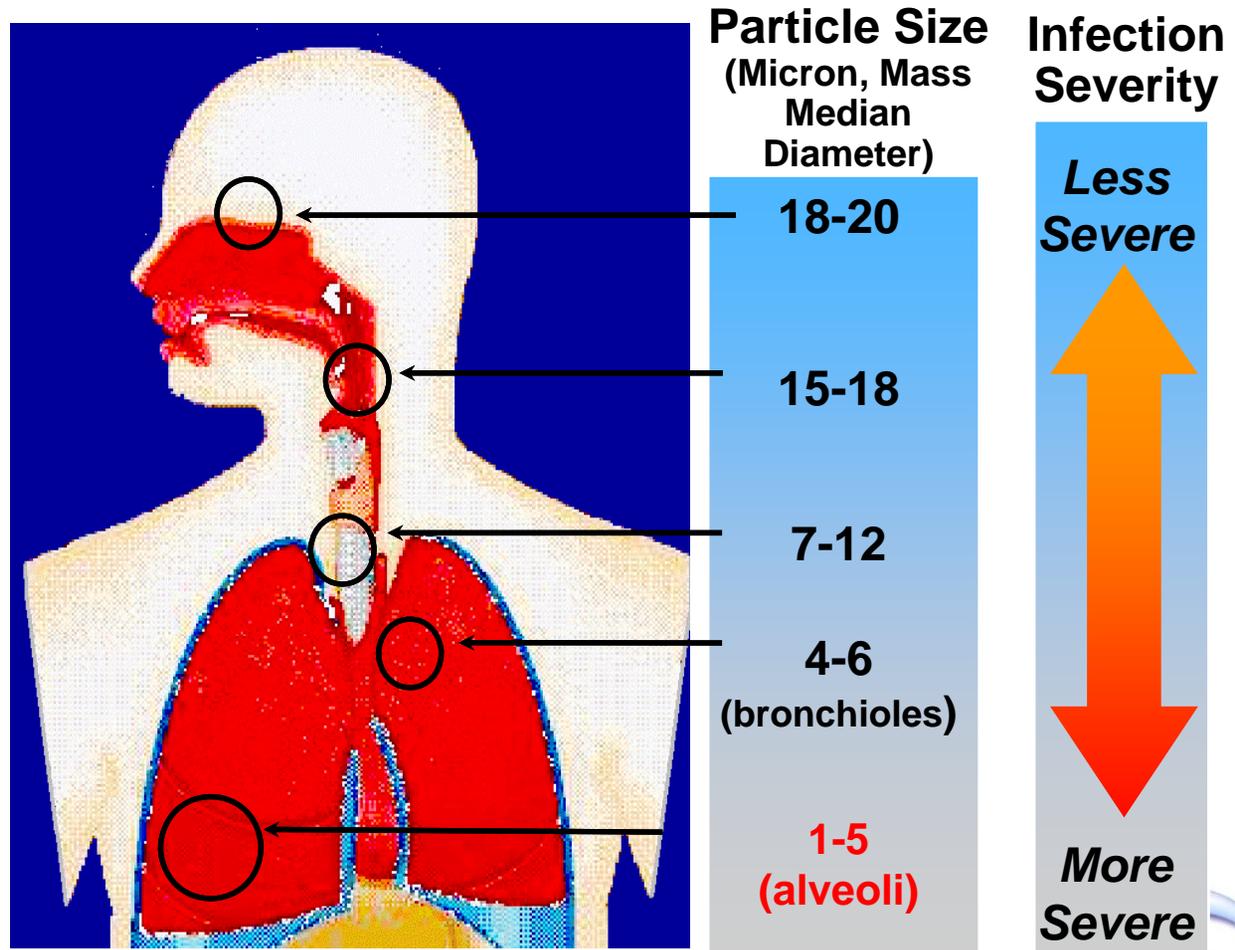
Dissemination methods



Aerosol / Infectivity Relationship

The ideal aerosol contains a homogeneous population of **2 or 3 micron** particulates that contain one or more viable organisms

Maximum human respiratory infection is a particle that falls within the 1 to 5 micron size



Weaponization

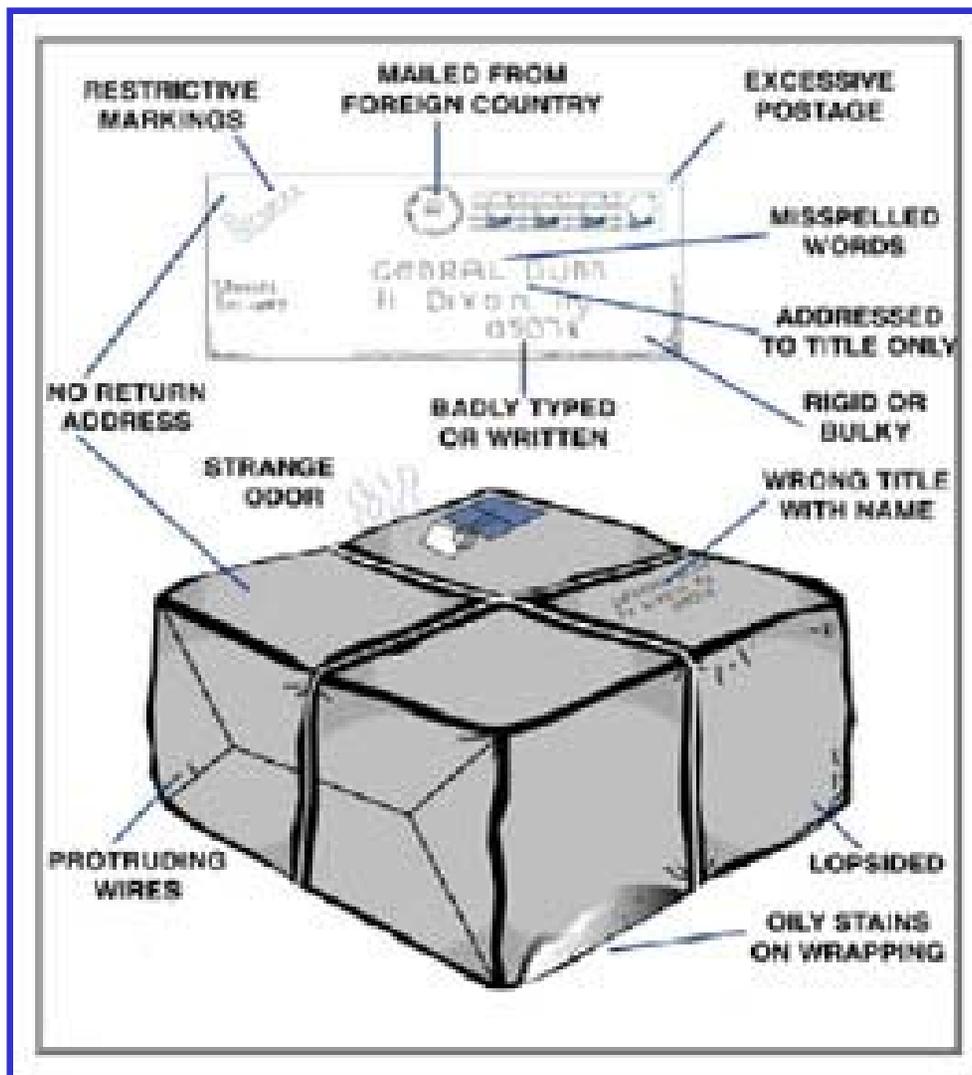


Potential Targets in Your Area

- ***Government Offices and Facilities***
- **Political Organizations and Emotionally Charged Issues!!!**
- **Professional Sporting Events**
- **Amusement Parks**
- **Concerts and Outdoor Events**
- **Convention Centers**
- **Commercial & Retail Facilities**



What Constitutes a Reasonable Threat?



SUSPICIOUS MAIL ALERT

If you receive a suspicious letter or package:



- 1** Handle with care. Don't shake or bump.
- 2** Isolate it immediately
- 3** Don't open, smell, touch or taste.
- 4** Treat it as suspect. Call local law enforcement authorities

If a parcel is open and/or a threat is identified . . .

For a Bomb:
Evacuate Immediately
Call Police
Contact Postal Inspectors
Call Local Fire Department/HAZMAT Unit

For Radiological:
Limit Exposure - Don't Handle
Evacuate Area
Shield Yourself From Object
Call Police
Contact Postal Inspectors
Call Local Fire Department/HAZMAT Unit

For Biological or Chemical:
Isolate - Don't Handle
Evacuate Immediate Area
Wash Your Hands With Soap and Warm Water
Call Police
Contact Postal Inspectors
Call Local Fire Department/HAZMAT Unit

Identifying Suspicious Packages and Envelopes

- Excessive postage
- *Handwritten or poorly typed addresses*
- Misspelled common words
- **Strange or absent return address**
- Not addressed to a specific person
- **Marks such as “Personal,” “Confidential,” or “Do Not X-Ray”**
- Marked with threatening language

- **Powdery substance felt through or appearing on the package or envelope**
- **Oily stains, discolorations or odor**
- **Lopsided envelope**
- **Excessive packaging material - masking tape or string**
- **Excessive weight**
- **Ticking sound**
- **Protruding wires or aluminum foil**



Types of Threats



Overt

- **Announced**
- **Example:** Letter announcing contents of a package with ricin or anthrax
- May be for publicity
- May be hoax

Covert

- **Unannounced**
- Intended to cause mass casualties before detected
- Health care providers may not initially recognize

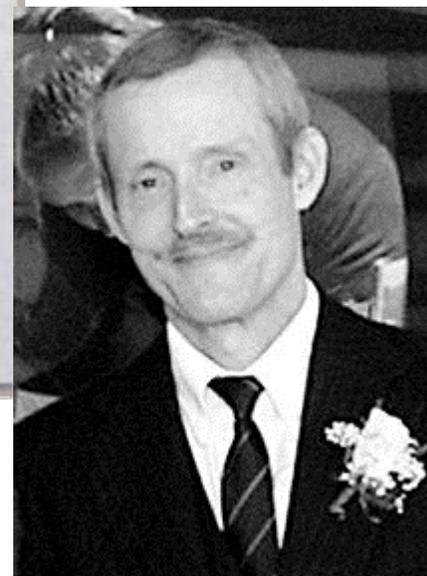
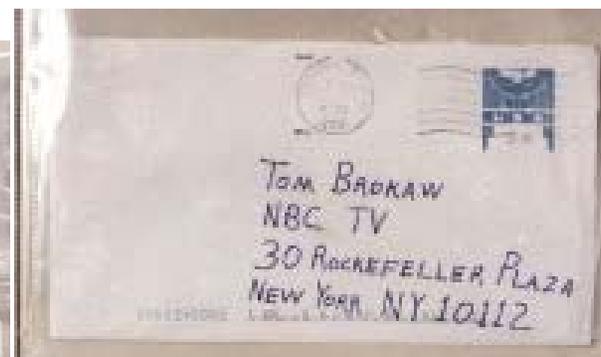
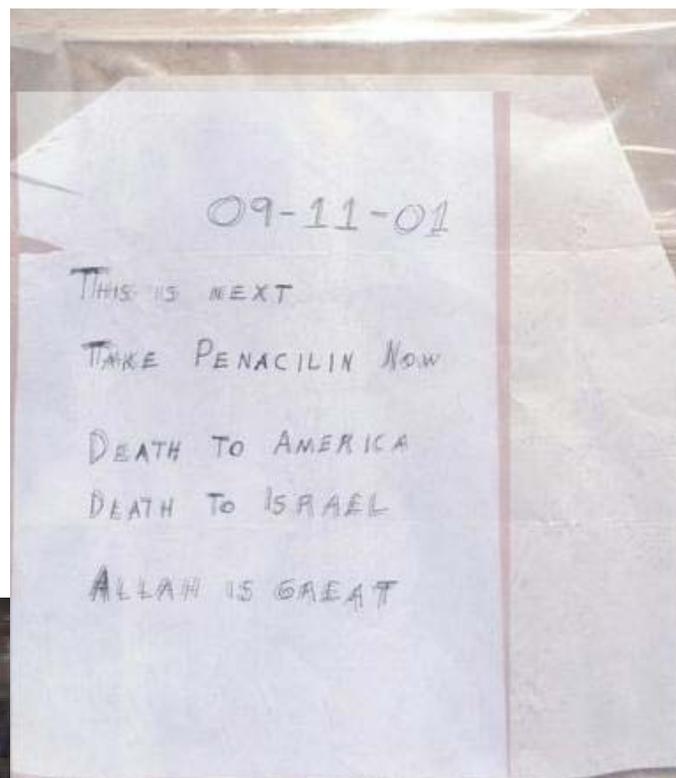
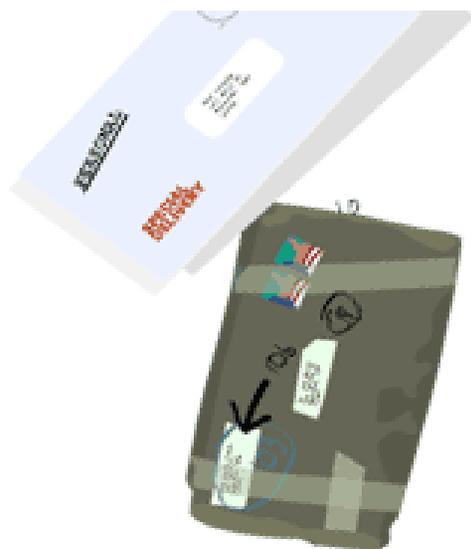


Surveillance

- **Syndromic Surveillance** – analysis of medical data to detect or anticipate disease outbreaks
- Many of the biological threats have very similar presenting symptoms.
- **Is every respiratory outbreak a terrorism incident?**
- The ideal system is **real time reporting** of patients with specific symptom complexes with immediate processing of this information by the health department, and rapid feedback to the medical care providers.



October 2001 Anthrax Mailings



Some Recent Headlines !!!!



“Toxic *Ricin* found at South Carolina postal facility.”



“A letter addressed to the White House was intercepted after it was found to contain *Ricin*”

“Senator Frist reports that *Ricin* found in Dirksen Building.”



The Florida Experience...

- Approximately **7,000** items tested in Florida
- No item tested positive on confirmatory testing – outside of the AMI building
- Most items were simply everyday items

Cream Filled Cookies

Keyboards

Catalogs with Absorbent Powder

Collection Notices

Rolls of Money

Airliner Seat Trays

Sets of Luggage

Car Bumpers and Doors



The “REAL” effect of Bioterrorism

- In 2001, there were 11 cases of inhalation Anthrax and 12 cases of cutaneous anthrax, **5 deaths**.
- **32,000 people took Ciprofloxacin for 60 days.**
- There were thousands hoaxes and false alarms in the months following the attacks.
- **Billions of \$\$\$ have been spent to protect our citizens.**
- **One postal facility re-opened recently after a \$180 million renovation.**
- **Is this the most efficient way of protecting Americans and assuring National Security?**



Where are the Weapons??





The Former USSR Program



“With the collapse of the Soviet Union, the danger once posed by our weapons work has sharply diminished. Biopreparat claims that it no longer conducts offensive research, and Russia's stockpile of germs and viruses has been destroyed. **But the threat of a biological attack has increased as the knowledge developed in our labs - of lethal formulations that took our scientists years to discover - *has spread to rogue regimes and terrorist groups.*”**

“Through our covert program, we stockpiled hundreds of tons of anthrax and dozens of tons of plague and smallpox”



****From Biohazard by Ken Alibek and Stephen Handelman- Published by Random House****

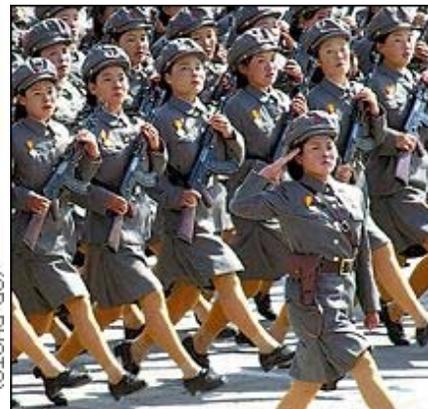
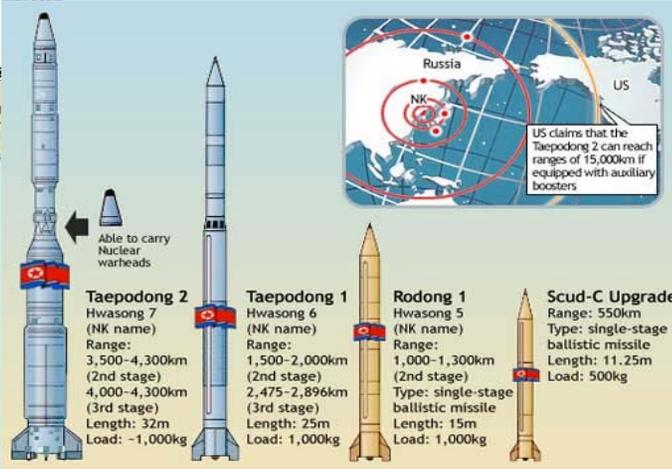
Iraqi Offensive BW Program: Weaponized Agents

1995 disclosures to U. N.

	<u>Produced</u>	<u>Weaponized</u>
Botulism toxin	19,000 L	10,000 L
Anthrax spores	8,500 L	6,500 L
Aflatoxin	2,200 L	1,580 L



North Korea



- ## R & D Efforts:
- *Anthrax*
 - *Botulinum toxin*
 - *Hemorrhagic Fever*
 - *Smallpox*
 - Tuberculosis
 - Typhus
 - Typhoid
 - Yellow Fever
 - Cholera

Additional Challenges

- Extraordinary advances in modern biology and life science research
- Access and knowledge becomes easier and more sophisticated
- Growth of companies researching and looking for alternative applications of these agents
- Declining share of technology under government control
- Getting into more and more hands



Examples

- 2005, Maine Biological Labs was fined \$500,000 by US Government and given 5 yrs probation marketing unlicensed viruses and toxins to Syria.
- 2005, A New Jersey Company, Becton Dickinson, was fined for exporting viruses and toxins to India
- A Texas company was recently fined for exporting 13 chemical and biological agents to various locations
- A San Diego company also recently fined \$1M for exporting toxins to Canada



Identifying the Threat

- As of 2002, an estimated 1,469 facilities in the US possess, work with, or transfer listed agents..
- USA Patriot Act 2001 and Bioterrorism Act of 2002
- BWC has lack of formal mechanisms for monitoring and verification, and efforts to strengthen the treaty have been unsuccessful.
- Lack of international biosecurity guidelines



Bottom Line

- Global security nightmare – failing to keep pace with changes
- Guards, guns, and gates approach will NOT work
- Need to be more innovative on we approach these threats



Thank you

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