

8/11/05 JHK How to Run 0905

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The Threat of Biological Weapons

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Working Group on Effective Filtration Systems

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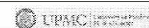
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Potential weapons

- Nuclear
- Other explosives
- Chemical
- Biological

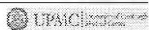
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Biological weapons are different

- Nuclear
 - Expensive
 - Substantial expertise required
 - Not easy to keep secret
- Chemical
 - Need for precursor chemicals
 - Large volume needed for major impact
 - Not readily dispersed over large area

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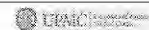


Biological weapons

"the poor man's nuclear weapon"

- Necessary ingredients available
- Can be produced in small facilities
- Inexpensive
- Few technical staff required
- Small quantities produce a major effect
- Easily transported from place to place

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New World Coming

"While conventional conflicts will still be possible, the most serious threat to our security may consist of unannounced attacks on American cities by sub-national groups using genetically engineered pathogens."

U.S. Commission on National Security/21st Century
15 September 1999

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Biological Weapons

- A threat, largely ignored until 1998
 - Too difficult to grow
 - Technologically difficult to disseminate
 - An inherent moral barrier unlikely to be transgressed

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Civilian initiatives in national security 1995-99

- Presidential Decision Directive #39 –1995
- 1997 Defense Against Weapons of Mass Destruction Act
 - DoD responsible for organizing domestic preparedness
 - To train teams of first responders in 120 major cities
 - National Guard Rapid Assessment teams (RAID) for States
 - Marine Corps Incident Response Force
 - Army Technical Escort Unit
- Dept. of Justice and FBI given special funds

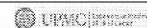
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Initial Assumptions not yet fully corrected

- For terrorist threats, the solution is entirely encompassed in emergency response measures
 - Police, fire, emergency staff for rescue and to deal with chemical leaks, spills, etc
 - "The lights and sirens approach"
 - DoD to do the training
 - FBI to find the bad guys
 - FEMA to deal with recovery
 - Public health and medical problems -- all but ignored
- Chemical and biologic weapons require the same response-- hence, a new word "CHEMBIO"

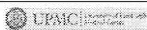
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A reassessment of strategies – 1998-2001

- Center for Civilian Biodefense Strategies
 - Working group on priority (Class A) agents
 - Two national symposia for medicine and public health professionals
 - Meaningful funding of HHS – FY 2000
 - The Dark Winter exercise (June 2001)
 - The anthrax attacks (October 2001)

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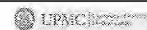


Biological Agents of Greatest Concern

- | | |
|------------|----------------------|
| • Smallpox | • Plague |
| • Anthrax | • Tularemia |
| | • Botulinum Toxin |
| | • Hemorrhagic fevers |

Agents that if released, could threaten the integrity of government

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Smallpox – a diminished concern

- More than 300 million vaccine doses
- Network of 100 diagnostic laboratories
- Educational materials readily available
- Acquisition of virus – not easy
- Production of weaponized smallpox – moderately difficult

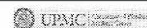
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Anthrax – the most frightening gorilla

- B. anthracis – easy to obtain
 - Former Soviet laboratories
 - Natural infections occur around the world
 - Cases in man and animals in U.S. every year
 - Until 2003 – 46 labs offered specimens
- Demonstrable intent and capability to use
 - Aum Shinrikyo
 - Iraq
 - Russia
 - The U.S. terrorist "x" of 2002

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Dispersal of anthrax

- Aerosols – either from powder or slurry
 - Methods of preparation widely known
 - Only a small, modestly equipped lab needed
 - Crop dusters
 - Ambient sprayers-- easily obtained
 - Ventilation systems
 - Mail

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Prevention and detection measures

- Prevention
 - Interdiction of terrorists – unlikely
 - Large scale vaccination – vaccine supply limited
- Detection
 - Bioswatch – forget it
 - Early, rapid diagnosis – difficult

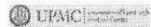
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Response

- Vaccination and antibiotic distribution
 - A logistics nightmare
 - Vaccine supply still very limited
 - Limited tolerance of antibiotic for 60 days
 - Is there a risk beyond 60 days?
 - Possibly antibiotic resistant engineered strain
- Clean-up of environment
 - How much is really needed?
 - Cumbersome, expensive and uncertain at best
- Patient treatment
 - Available therapies require very early treatment
 - Longer-term after-effects appear to be a problem whatever the treatment

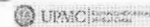
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Aerosols and filtration

- Most likely means for dissemination of spores
 - Indoor aerosol easiest, requires smallest amount of material and little equipment to carry out. A very few targeted attacks, requiring little effort and anthrax could result in panic on a national scale
 - Out door aerosol release via crop duster is possible but logistically complicated, esp. wind and weather patterns
 - Outdoor release from a point source, vehicle or back pack subject to similar disadvantages
- Reduction of number of spores inhaled is important
 - Dose to infect 50% of exposed is ~2000 – 10,000 spores

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- *Affordable, more efficient filtration systems could play a major role in reducing mortality where ever a release might take place. At present, the only other foreseeable approach toward providing a measure of greater security against an anthrax attack is vaccine – a possible option but still a long way off.*

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