Preparation for Bioterrorism: 
An 80% Solution 
Little Hoover Commission 

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Outline

- Biological Weapons: Hours Matter
- Consensus views from National Defense University
- What do veterinarians, doctors, public health officials and decision makers want, anyway?
- One solution: RSVP
- Next steps
  - How to keep physicians up to date
  - How to avoid doing something silly
My Biases

• There are no experts in biological weapons
• With use of biological weapons, there is no disaster “site”
• In clinical, non-military medicine, top down approaches fail
• We will never have sensors everywhere
• We already have sensors everywhere
• MDs don’t care much about public health
• MDs do care about individuals, but they are ridiculously busy
• Doing something is not always better than doing nothing
• It’s better to be approximately correct than be precisely wrong
• 80% solutions are here now
Scenario: Line Release of Anthrax (100kg) in NYC, DC, and LA

Case 1: Medical surveillance cues medical intervention on day 3
Medical intervention:
- prophylaxis program using doxycycline
- assumed 70% effective at preventing symptoms

850,000 fatalities

Case 2: HEPA filtration; Environmental Monitoring cues medical intervention on day 2
HEPA filtration
- 25% of population in buildings with filtration
- filtration assumed 100% effective at preventing exposure

3,500,000 fatalities without intervention

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The course of the Lev Berg
Summary of Cases

Figure 1: Smallpox Cases, Aral'sk 1971

D = Death

Index Case
8/11 or
8/12/71

First Transmission case
8/27/71

Infection approx.
7/29/71
The course of the Lev Berg
NDU: Observations on Bioterrorism (BT)

• In the anthrax outbreak, clinicians were key decision-makers
• There are 8,000 public health agencies, without co-ordination
• No mandate, incentive, or ongoing funding
• Maintaining continuous situational awareness will be very hard
• We need adaptive decision-making
• Incidence command structure will probably not work in medicine
• Medical system and public health are separate systems
  • Bottom Line: “Can we make public health part of medicine?”
Consensus Commentary on BT: NDU

• We have a dirth of experience, including among clinicians
  • Training and research are necessary and must be *inherent*
• Medicine and public health, like politics, are *local* phenomena

• Risks of the solution (or treatment) must be perceived to be less than the risks of disease
• Remember what the public will accept
• Remember what the public will believe
• The Media is your friend or your enemy--> you choose
  • but, you better have reliable, up-to-date information
Synthesis: Requirements for a BW surveillance system

- Continuously available communications on a “Need to Know” basis
- Low cost, epsilon-->zero intrusiveness to individuals
- Reliable, low cost, low intrusiveness to physicians
- Make public health part of medicine, and medicine part of public health
- Take the load off of labs, where possible
- Training for health-care providers should be inherent in system
- Local entities control data, but
  - other agencies should have easy access to information
  - high level agencies have selective access
- A “BW surveillance” system must be sustainable on its own merits
Problem: Early Identification of Disease

• Current reporting is “disease-based”
  • Laboratory confirmation
  • Slow
  • Sometimes insensitive, but still VERY helpful
• Physicians/Veterinarians rarely report unusual symptoms
  • Reporting may be laborious
• Public health response may be slow, but it is authoritative
  • data dissemination is slow
  • may be of no utility to practicing physician
  • rare use of geographic tools
### What do doctors want?

- minimal data input requirements
- timely advice from public health officials only “when necessary”
- routine data regarding ongoing outbreaks
- painless BW training and seamless integration with daily tasks

### What do public health officials want?

- routine surveillance
- rapid alerting of serious diseases
- tools for analysis
- easy communication with physicians
- low cost, low intrusiveness

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A Solution: “SLaP” surveillance Syndrome - Lab - Public Health

• “Bottom Up” approach
• Geographic information
• Clinical information
  • Symptoms -- patient complaints
  • Signs -- physician examination
• Data entry is easy and fast
• Immediate dissemination to:
  • physicians
  • public health officials
• Rapid data analysis
Syndromes: Combinations of “signs and symptoms”

The Rapid Syndrome Validation Project uses:

• Influenza like illness / undifferentiated febrile illness
• Acute hepatitis
• Fever with Central Nervous system findings
• Fever with rash
• Acute severe (or bloody) diarrhea
• Adult Respiratory Distress Syndrome
• On-line RSVP Demonstration
Practical Experience to Date

• 40 physicians in 4 clinics
• over 1 year
• New Mexico Department of Health
• Average physician use
  • reviews “infectious disease background” daily
  • values data from other physicians
  • reports severe cases
  • one alarm to Department of Health
• Unknowns
  • robustness of reporting
RSVP Installations and Next Steps

• New Mexico
  • Las Cruces -- Pediatrics, FP, Urgent Care, ER
  • Albuquerque -- 8 Community Health Care Clinics, 1 Occupational Medicine Clinic
• California
  • Livermore -- 1 Occupational Medicine Clinic
  • Kaiser Permanente, Northern California Emergency Rooms (3)
• Texas
  • Brownsville -- 6 Community Health Center Clinics
  • Lubbock -- 6 Community Health Care Clinics
• Singapore
  • 24 polyclinics (approximately 20% of population)
• RSVP for ANIMALS (RSVP-A)
• Continuing Medical Education -- Automated! Via recognized commercial provider
• NATO Military and Dependents medical clinics
RSVP-A (Animals)
A System for Rapid Detection of a Bioterrorism Attack on Livestock

RSVP-Animals is a syndrome monitoring system for the early detection and reporting of disease outbreaks in animals.

Technical Approach:
• **Rapid Syndrome Validation Project (RSVP)-Humans** was developed to monitor human syndromes associated with infectious human diseases. It is now ready for nationwide deployment.

• **RSVP-Animal** is being developed as a corollary system to RSVP-H, designed to provide rapid feedback to stockers, veterinarians, state agriculture agents, and national-level monitors on the health of livestock.

• **RSVP-Animal** will have specific syndromes identified for each type of animal (e.g., beef cattle/dairy cattle, horses, swine, sheep):
  • Animal syndrome data entered into **handhelds** (PDAs) in field
  • Syndrome reports apply a “knowledge engine” to screen data, analyze clusters for outbreak signals, and to aid in the rapid investigation of emerging infectious diseases.

Operational Capability:
• Concept is to build an internet-based network that links ranchers, stockers in stockyards, and veterinarians with USDA/APHIS and emergency planners to expedite the response to infectious animal disease outbreaks.

• Continuous interactive system for lay-stockers and veterinarians to report large-animal syndromes associated with dangerous, infectious disease outbreaks (location by county, type of animal, syndrome, environmental conditions, and time data).

• RSVP-Animal will mitigate agroterrorism consequences by quick detection of infectious diseases, reduced economic impact on agri-business, and reduced psychological impact public.

Customers and collaborators:
• U.S. Department of Energy, Office of Nonproliferation and National Security, Chemical and Biological Nonproliferation Program

• U.S. Department of Agriculture, APHIS and ARS

• Kansas State University, College of Veterinary Medicine

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- General Description
- Manual - Latest version 2.3
- Demonstration site (“SNL Demo”)
- Contact Information
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Realistic Vision

- California, Texas, New York: approximately 500 sites in FY03
- 100 - 150 “General Practice” Veterinary Sites in Kansas?
- Combination of Human/Animal data at public health level
- Commercialization coming soon

- Version 3.0
  - Automated statistical “extraction”
  - Neural network predictive model
  - Enhanced geographic tools