



# Preparedness and Response to Bioterrorism

National UASI Conference 2008

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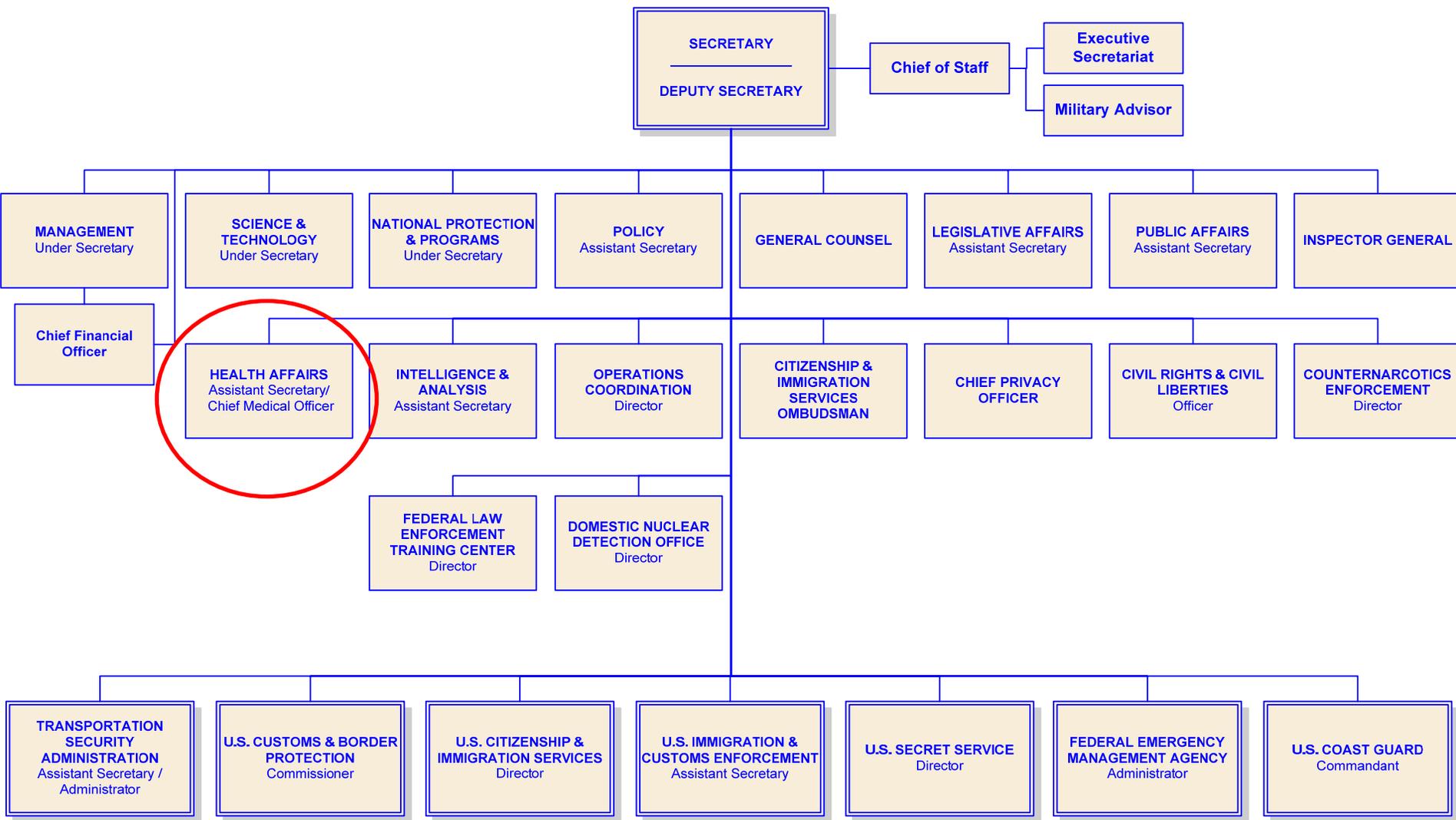
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# All-Hazards and All-Threats



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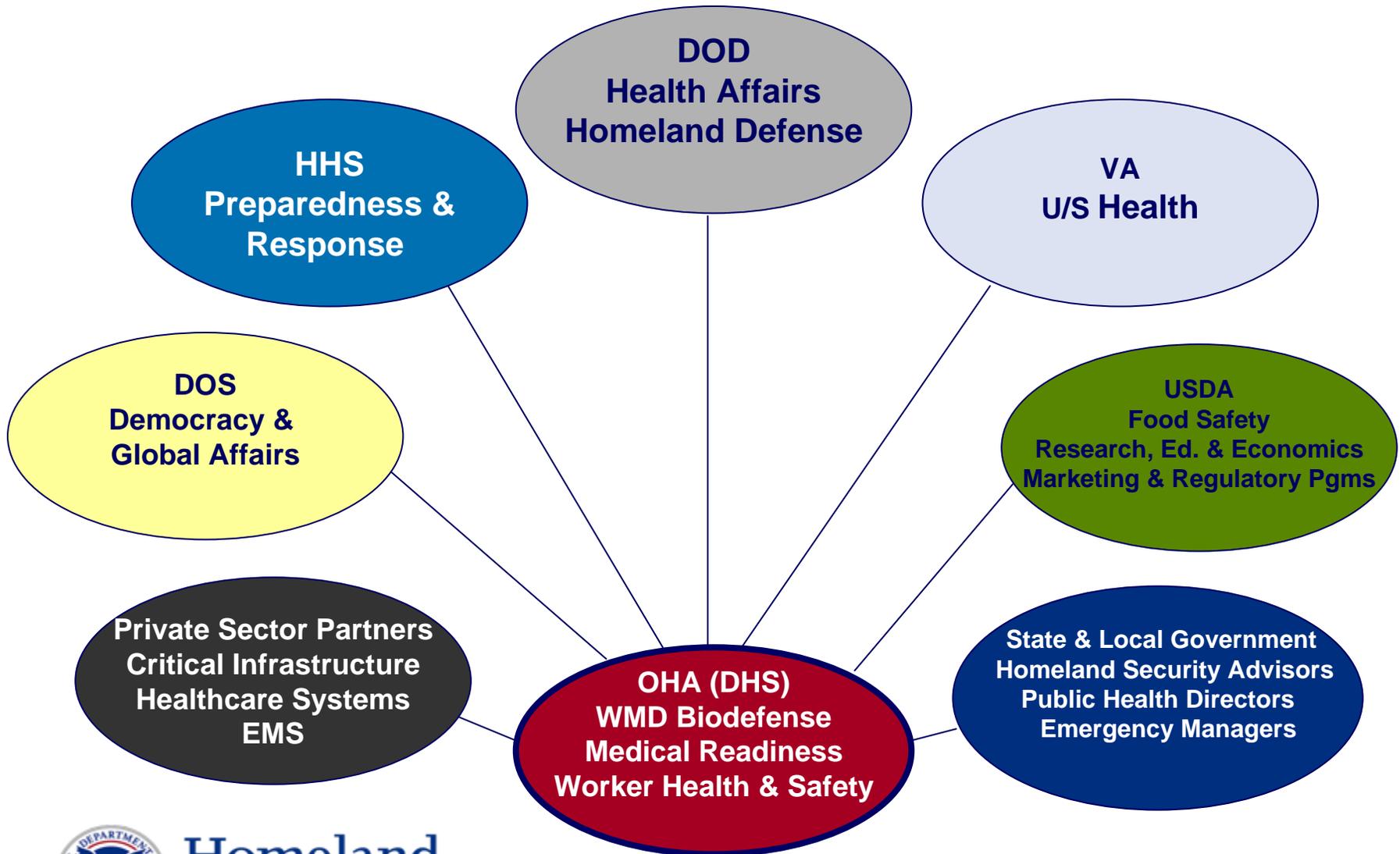
# U.S. DEPARTMENT OF HOMELAND SECURITY



Approved 4/4/2017

## Homeland Security

# DHS Health Affairs Integration



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*“Dr. Runge, based on all the threats we face as a nation, what keeps you up at night?”*

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# Questions on Bioterrorism

- How do we prevent a large-scale bioterrorism attack from becoming a “nation-changing” event?
- Can we rapidly detect a biological attack through early warning systems?
- Are state and local first responders adequately trained and equipped to handle a bioterrorist attack?
- Are we able to effectively distribute and dispense life-saving countermeasures in the small window of opportunity?
- Will a city contaminated by anthrax or another biological agent ever be able to fully recover?



# Current Biological Threat Environment

- The dissemination of an aerosolized anthrax attack in an urban area is our **#1 biological threat**.
- Al-Qaeda leadership has made their intentions known as well as their desire to develop a weaponized form of anthrax.
- An attack would **not** necessarily be known for some time.
- There would be **no** large explosions or other visual impacts.

# The Anthrax Threat

-Unclassified-

- Caused by the spore-forming bacterium *Bacillus anthracis*
- Gastrointestinal, cutaneous, or inhalational disease
- DHS issued Material Threat Determinations for both *B. anthracis* (1/2004) and multi-drug resistant (MDR) *B. anthracis* (9/2006).
- Can be aerosolized without sophisticated techniques.
- Infection may be caused by a very small number of spores.



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# The Anthrax Threat

-Unclassified-

- High mortality despite treatment.
- Current medical countermeasure CONOPS depend on anthrax sensitivity to antibiotics.
- Drug resistant anthrax is a material threat but undocumented level of risk.
- Population Threat Assessment for plausible, high-consequence scenario (worst case).
  - Exposed: 3.3 million
  - Infected: 266,700 persons (drug sensitive) pneumonia requiring intensive care

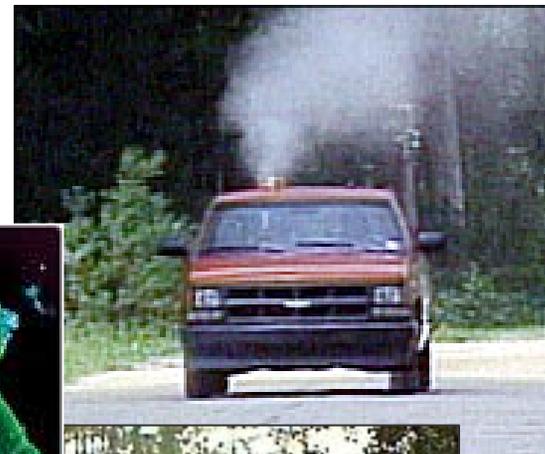


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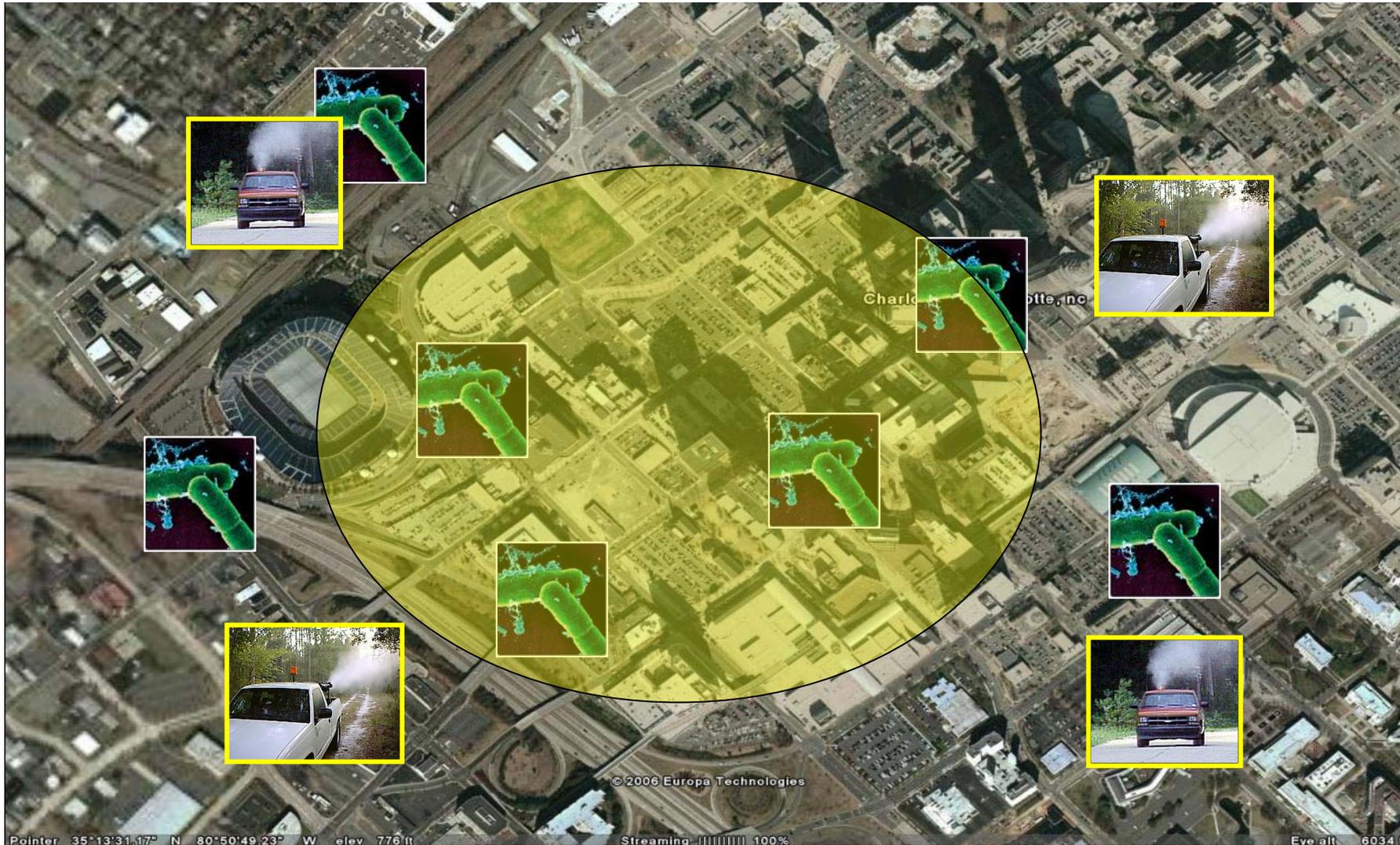
# Notional Anthrax Attack on Charlotte

## Planning Scenario Overview

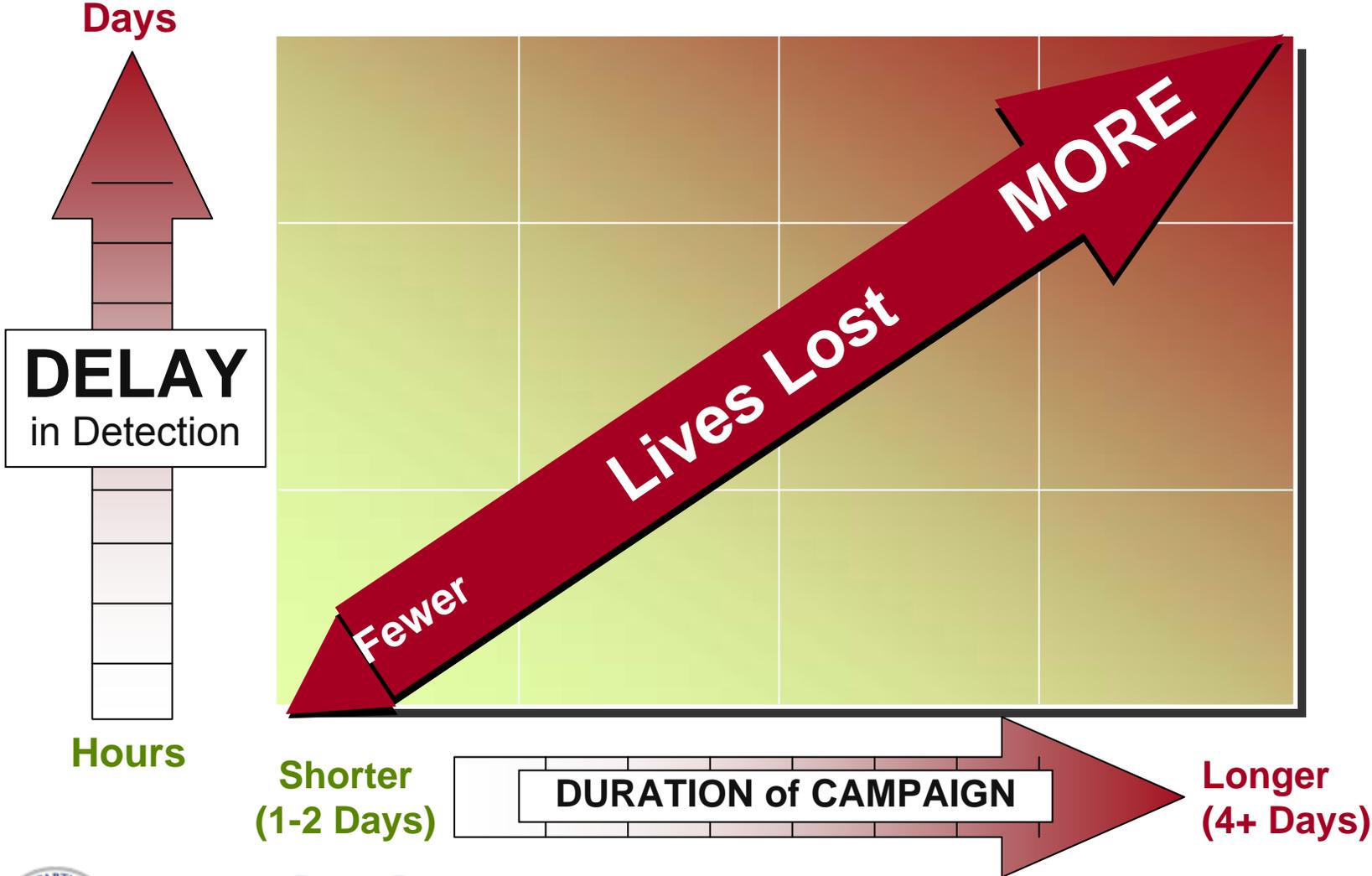
- ▶ Terrorists disperse aerosolized anthrax spores near downtown Charlotte
- ▶ Spores sprayed upwind of the central business district



# Charlotte, N.C. – Notional Anthrax Attack



# Time is Critical



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Courtesy CDC

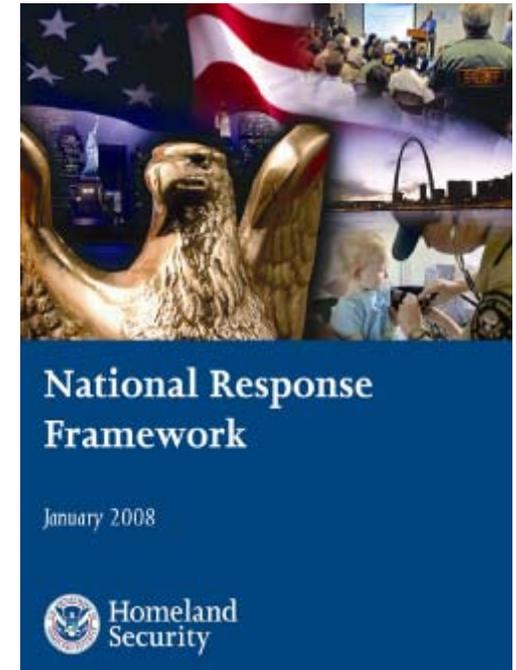
# Division of Responsibility

- What are your expectations of the Federal government for biodefense?
  - Threat Awareness
  - Detection, Surveillance and Warning
  - Infrastructure Protection
  - Response and Recovery
- How well prepared is the State and the community for the first 72 hours of a major consequence events?
- Are your medical personnel, law enforcement, public health, and elected officials ready to deal with CBRNE scenarios?
- Has the Community been educated?
  - “What will the people do?”



# National Response Framework (NRF)

- Written as guide for state, local, tribal officials and emergency managers
- Guides transition from request to implementation of Federal resources into existing response capabilities
- Designed to be flexible, scalable, and adaptable
- OHA provides 50,000 foot view of incident for Secretary DHS and FEMA Administrator



# National Biodefense Pillars (HSPD-10)

## *“Biodefense for the 21st Century”*

### **THREAT AWARENESS**

- Intelligence
- Assessments
- Anticipate  
Future Threats

### **PREVENT & PROTECT**

- Diplomacy
- Interdiction
- Critical  
Infrastructure  
Protection

### **SURVEILLANCE & DETECTION**

- Attack Warning
- Attribution

### **RESPOND & RECOVER**

- Response Planning
- Risk  
Communications
- Medical  
Countermeasures
- Mass Casualty Care
- Decontamination

**The Four Pillars of the National Biodefense Program**

# Elements of Biodefense

	<b>THREAT AWARENESS</b>	<b>PREVENT &amp; PROTECT</b>	<b>SURVEILLANCE &amp; DETECTION</b>	<b>RESPOND &amp; RECOVER</b>
Intelligence	●	●		
Surveillance			●	
Community Resiliency				●
Critical Infrastructure		●		●
Emergency Mgmt				●
Law Enforcement		●		●
Emergency Medical Services			●	●
Public Health			●	●
Health Care Sector			●	●
Public Communications		●		●



# Threat Awareness

- **DHS' Office Intelligence & Analysis (I&A)**, as part of the Intelligence Community (IC), produces intelligence and threat assessments;
- **Bioterrorism Risk Assessment (BTRA)**: A quantitative end-to-end risk assessment integrating intelligence, law enforcement, scientific, medical, and public health communities.
- **State and Local Fusion Centers**: Provide a two-way flow of critical law-enforcement and threat information for the sharing of timely and accurate information on all types of hazards.



# Surveillance and Detection

## BioWatch National Network



Operates continuously in more than 30 major population centers

Detects attacks against our Nation's cities and other high value assets

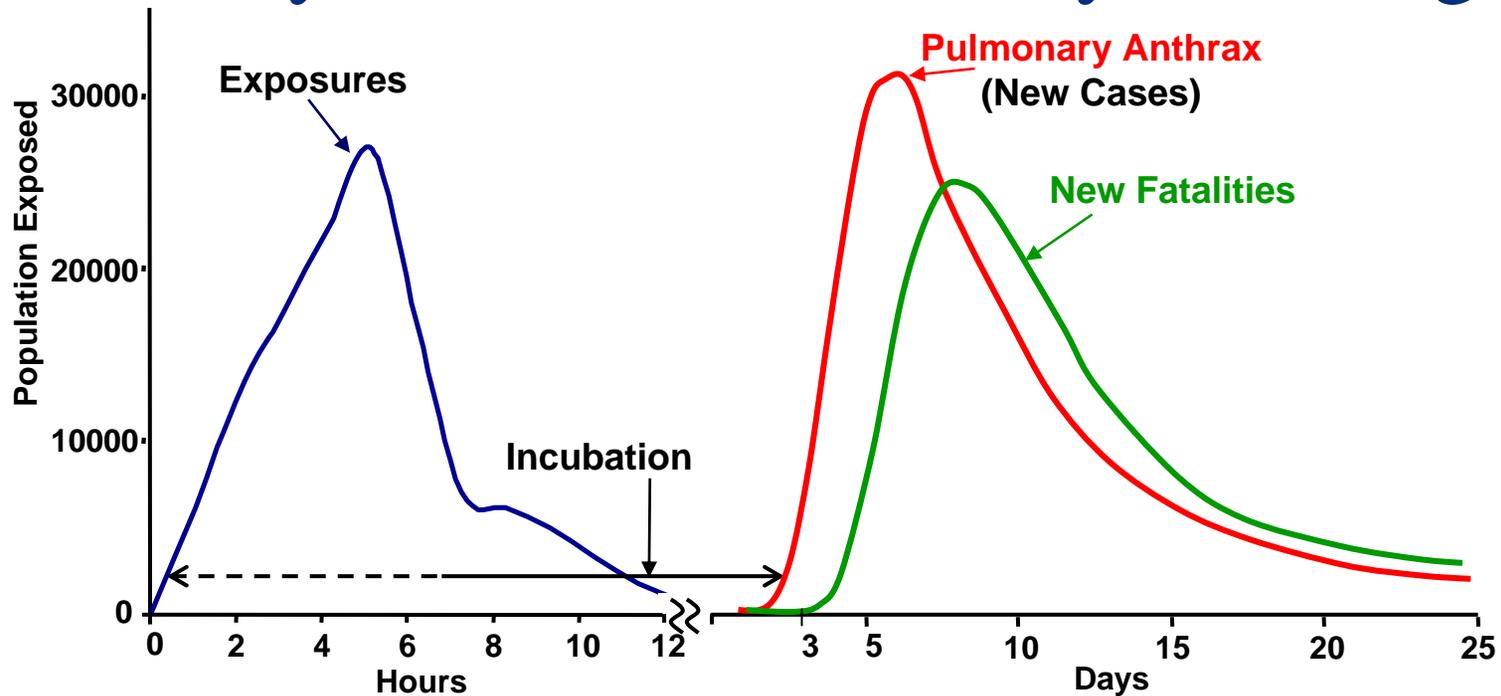
Poised to:

- Enable early detection
- Provide situational understanding to guide response
- Share information among partners
- Integrate into the national networks of reference laboratories
- Serve as critical element in a national capacity to respond rapidly to bioterrorism events



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# Defending Communities with Timely Detection and Early Warning



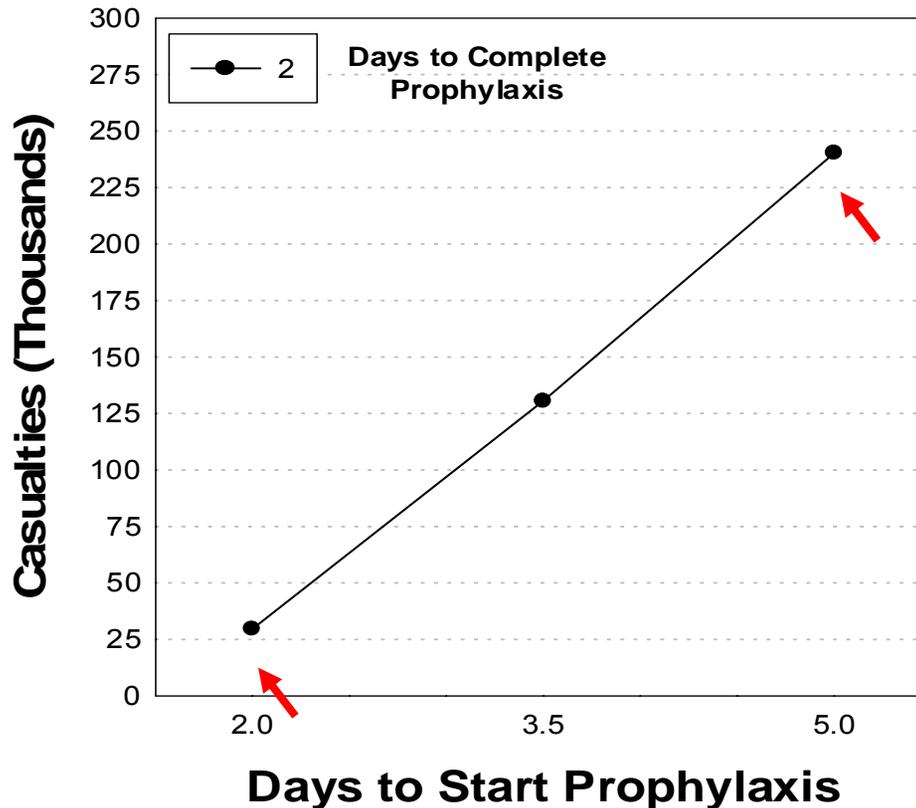
Prevent	Warn	Protect	Contain / Decon	Treat
Intel	Facilities Transport	Wide area monitoring	Restoration Portable detection	Early diagnostics
Intel/Law PHO	Bldg. owner	Mayor	First responders Hazmat lead Forensics	Public Health Org.



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# The Importance of CONOPs: Worst-Case Model Results

Winter Attack Dose-Dependent Incubation Period Probit Slope = 0.7

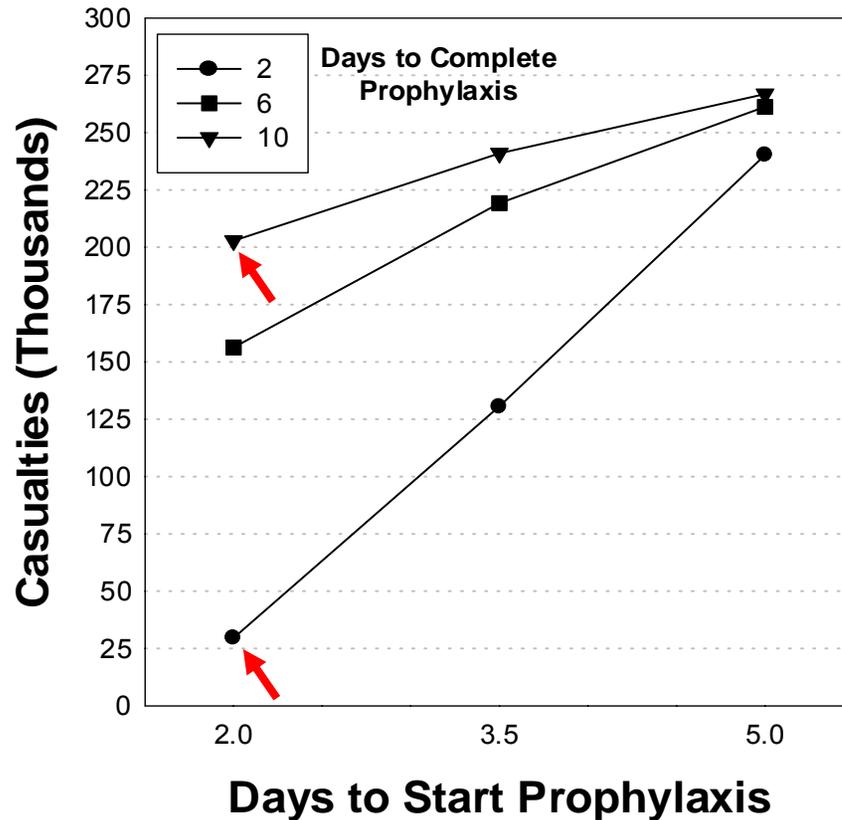


For each day that the **start** of prophylaxis is delayed,  $\approx 70,000$  more people will become symptomatic.



# The Importance of CONOPs: Worst-Case Model Results

Winter Attack Dose-Dependent Incubation Period Probit Slope = 0.7



For each day that the **completion** of prophylaxis is delayed,  $\approx 20,000$  more people will become symptomatic.



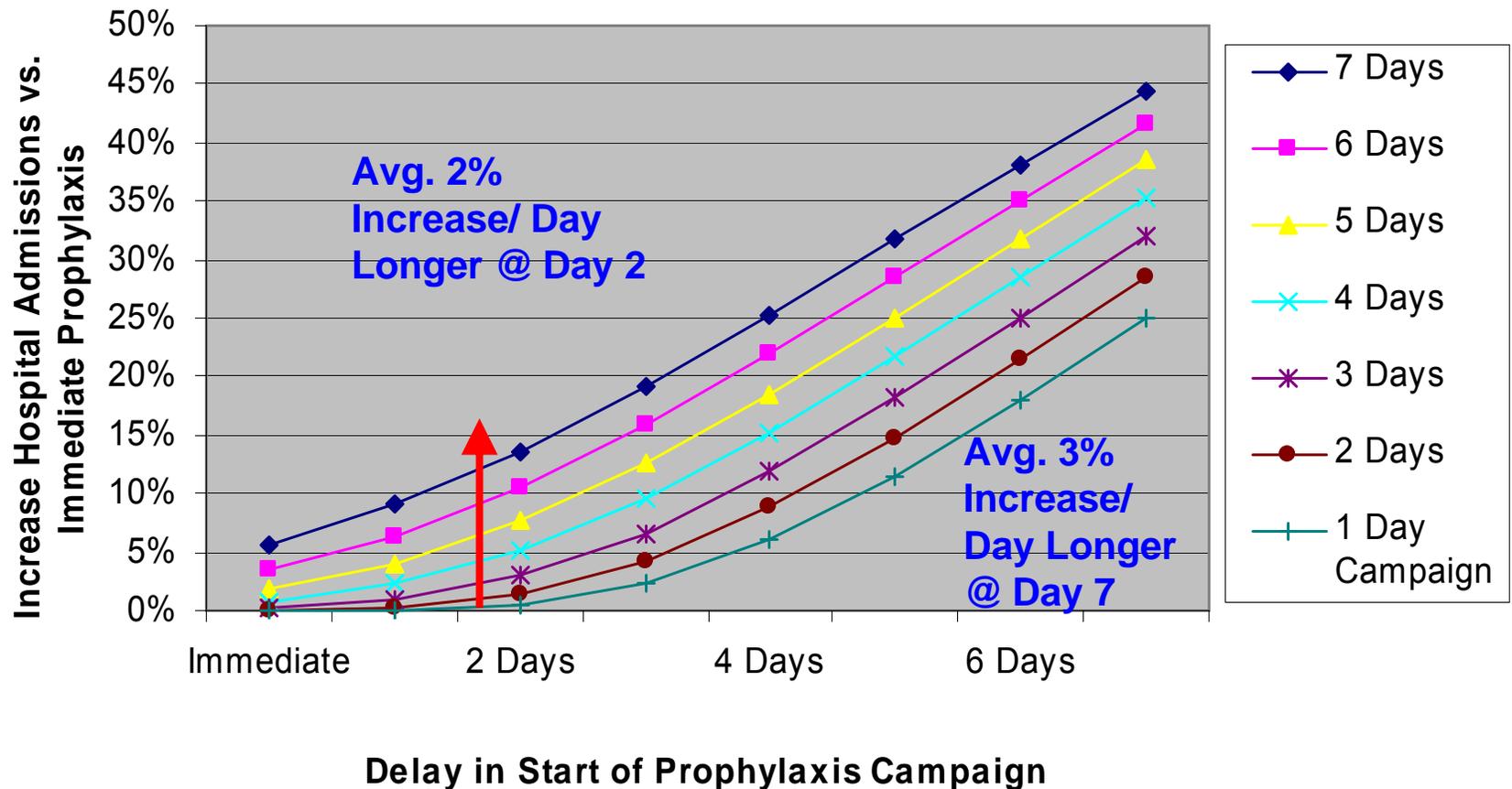
# Protection via Prophylaxis with Brookmeyer/ Wilkening Anthrax Incidence Curve (Optimal Case)

Campaign Duration	Delay in Detection							
	Immediate	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days
10 Days	84%	80%	74%	69%	63%	57%	51%	46%
9 Days	87%	83%	77%	72%	66%	60%	54%	48%
8 Days	90%	86%	81%	75%	69%	62%	56%	50%
7 Days	93%	89%	84%	78%	72%	65%	59%	53%
6 Days	95%	92%	87%	81%	75%	68%	62%	56%
5 Days	97%	94%	90%	85%	78%	72%	65%	59%
4 Days	99%	96%	93%	88%	82%	75%	68%	62%
3 Days	99%	98%	95%	91%	85%	78%	72%	65%
2 Days	100%	99%	97%	94%	88%	82%	75%	68%
1 Days	100%	100%	99%	96%	91%	85%	79%	72%



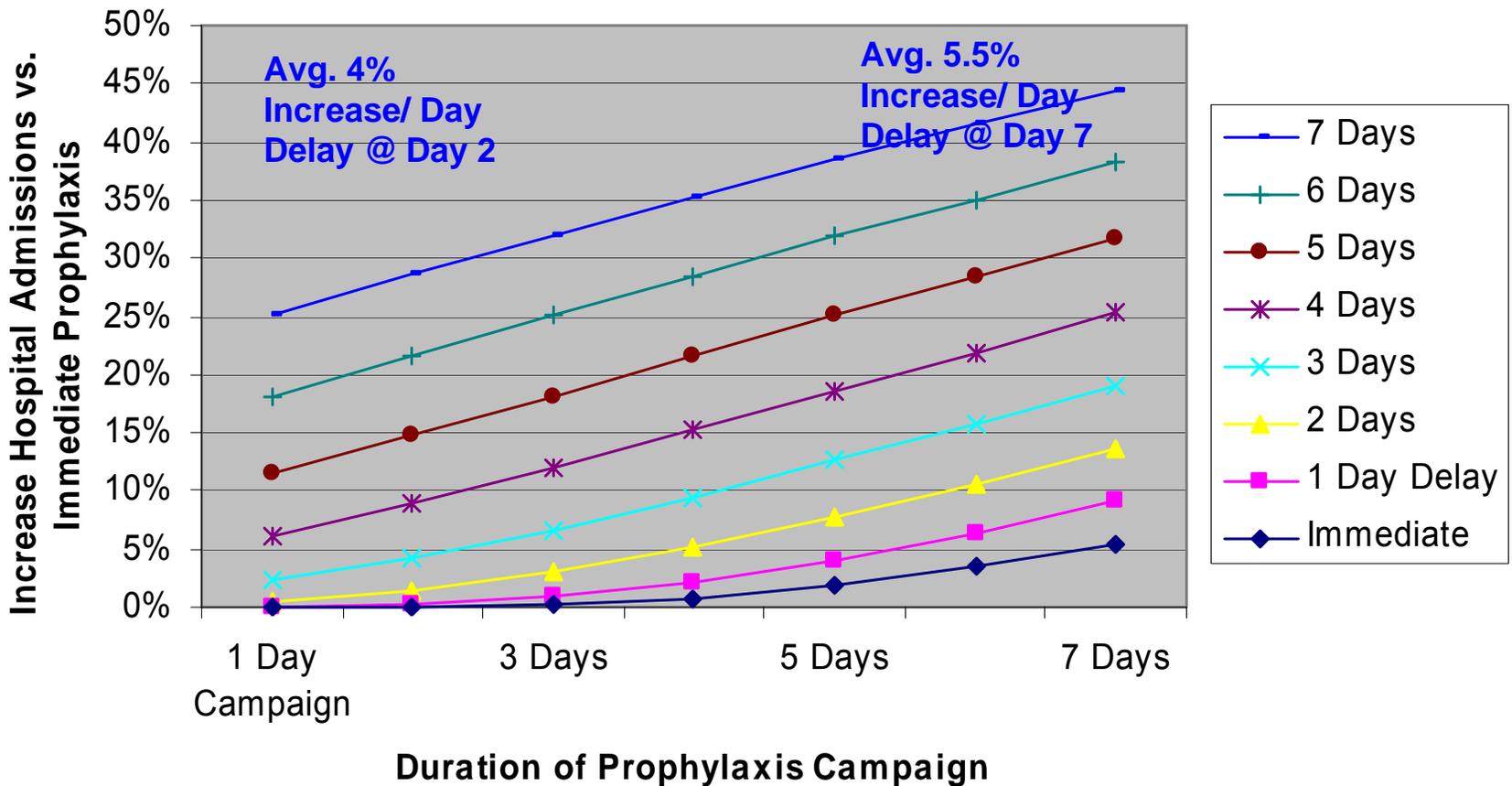
# Weill Cornell Regional Hospital Caseload Calculator Output

## Increasing Hospital Surge with Slow Mass Prophylaxis: Impact of Duration of Campaign

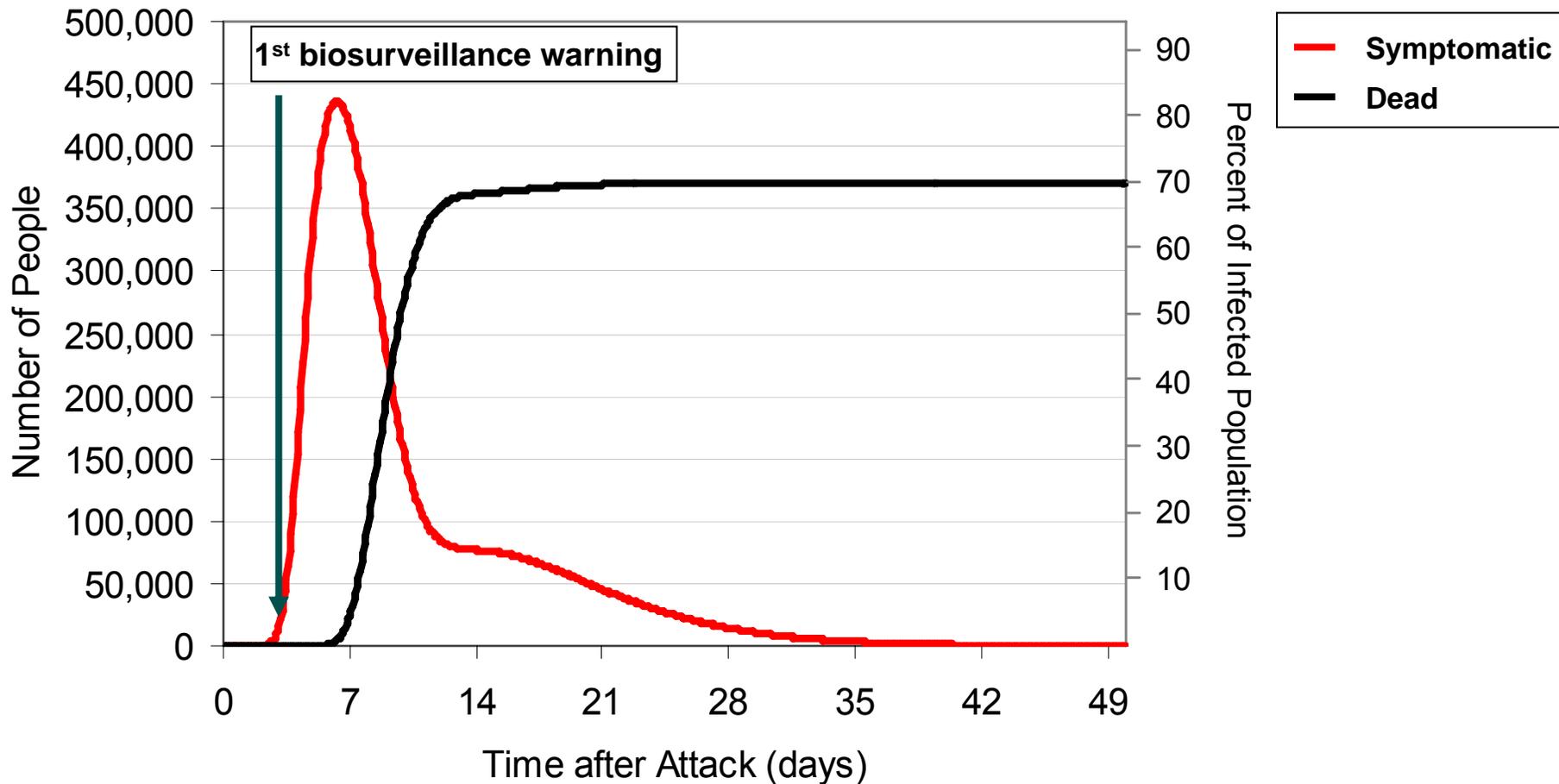


# Weill Cornell Regional Hospital Caseload Calculator Output

**Increasing Hospital Surge with Slow Mass Prophylaxis:  
Impact of Delay to Initiation of Campaign**



# No Post-Exposure Prophylaxis



# BioWatch Event to Detection Timeline

## Event-to-Detection and Confirmation

24 hours  
Aerosol Collection Cycle

Up to  
4 Hours

Filter  
Recovery

6 Hrs

Primary  
Screening

2  
Hrs

Full  
Agent-  
Specific  
Test  
Panel

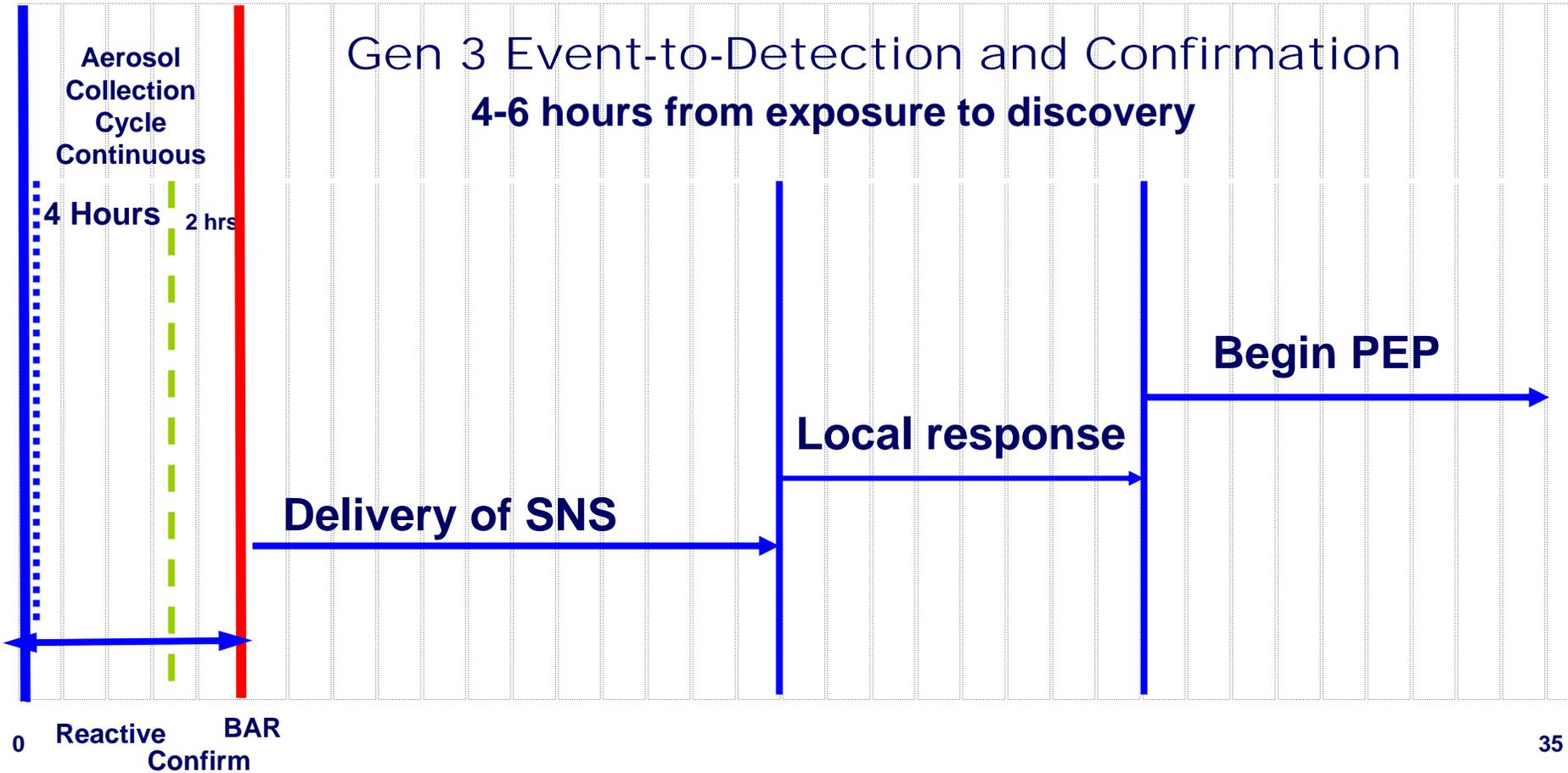
10 - 34 hours from exposure to discovery

Reactive BAR



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# BioWatch Event to Detection Timeline



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# Surveillance and Detection

National Biosurveillance Integration Center (NBIC)



## Analysis/Alerts

- Identify and characterize biological events of national concern in as close to real-time as is practicable
- Provide information to populate a Biological Common Operating Picture (BCOP)
- Alert senior leadership, member agencies, and public health agencies of state, local, and tribal governments regarding any incident that could develop into a biological event of national concern

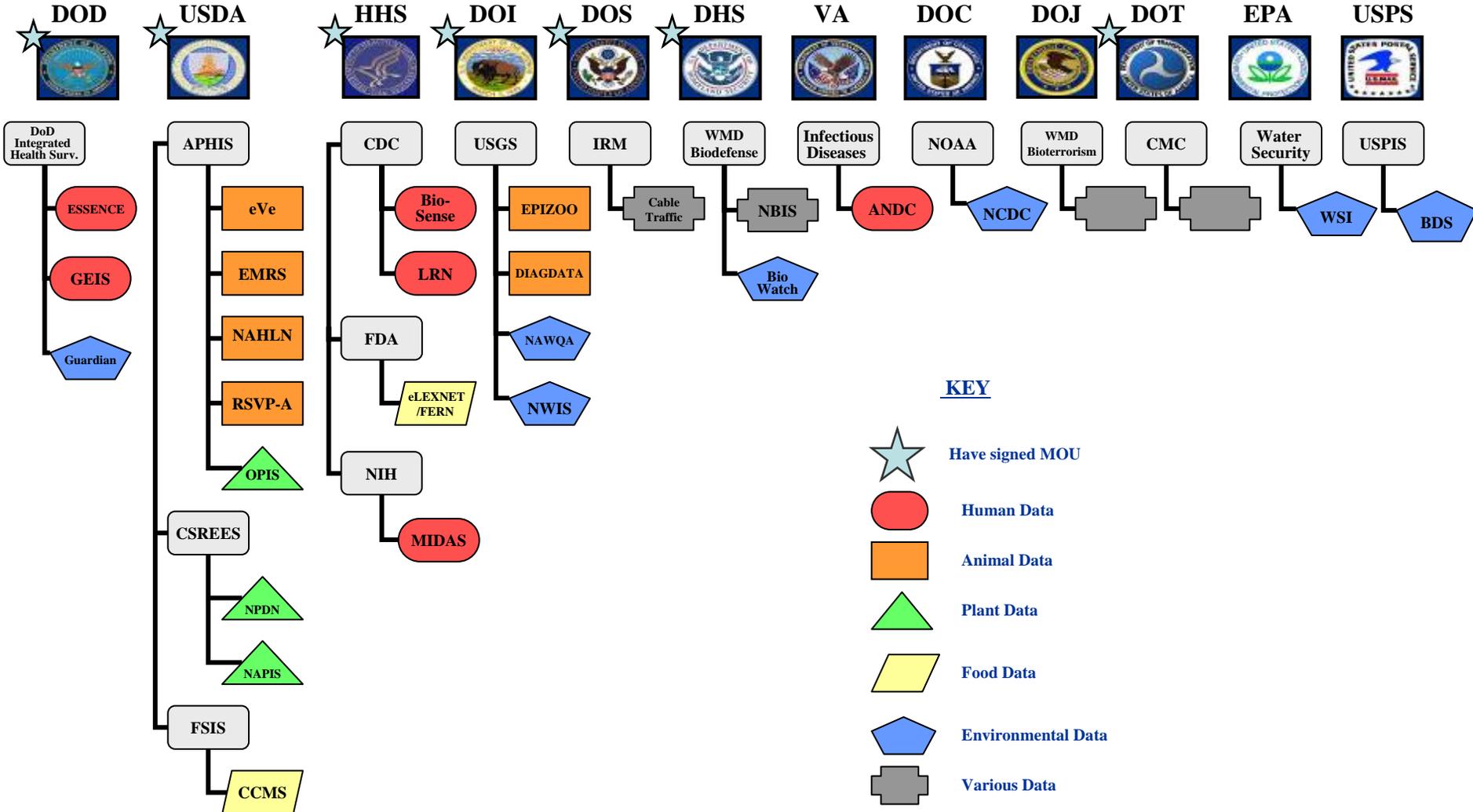


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# NBIS/NBIC Federal Network Integration

Federal, state and regional State Fusion Centers

Biosurveillance Common Operating Picture (BCOP)



# Prevent and Protect



- **Prevention:** Deny access to bioweapons; Rapid bioforensics and attribution; Prevent second attack
- **Protection:** Protect critical infrastructure/key resources (transit systems, telecom, etc.); integrated Federal, state, and local planning; home & business medical kits



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# Prevent and Protect

HSPD-7: Critical Infrastructure Sectors and Key Resources



# Respond and Recover



## •Respond

- Utilization of the National Response Framework to coordinate across Federal, state and local response networks (*USG*)
- Operational planning with state and local governments (*DHS*)
- Provision of PPE and chemoprophylaxis for response personnel (*DHS*)
- Distribution and deployment of medical countermeasures (*HHS*)
- Decontamination (*EPA*)
- Mass mortuary capacity (*HHS*)
- Public communication capabilities (*DHS*)



# Respond and Recover



## Recover

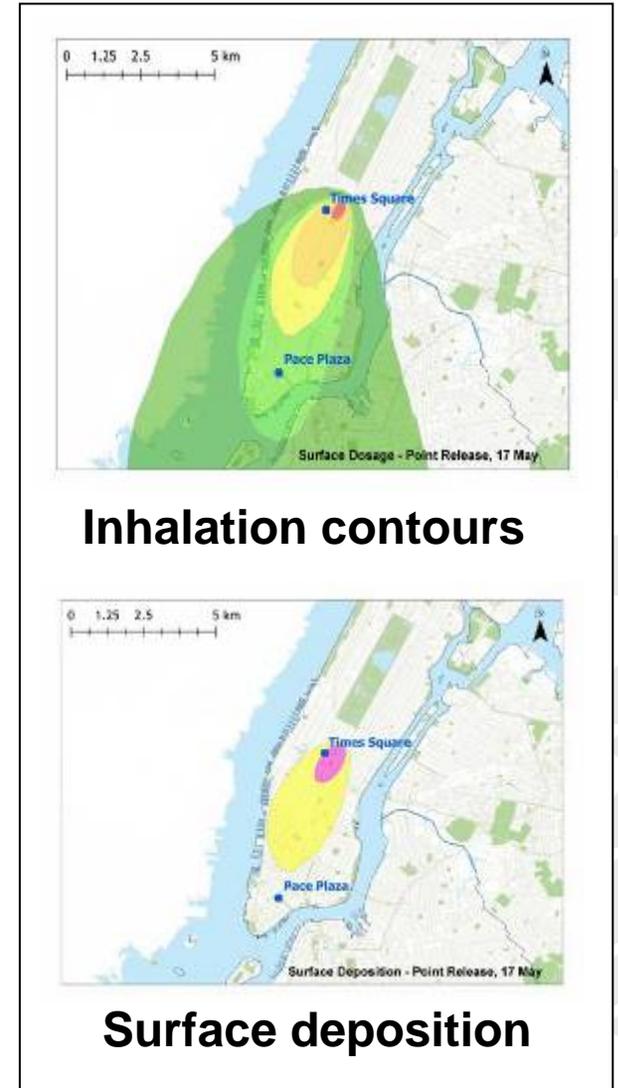
- Guidelines and operational plans to address specific standards, procedures, and capabilities to mitigate casualties
- Coordination with EPA to determine safety of contaminated environment and infrastructures
- Enforcement of exclusion zones
- Decontamination of people, vehicles, and infrastructures
- Facilitate post-exposure vaccination and protection of response personnel



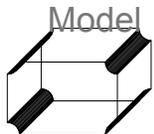
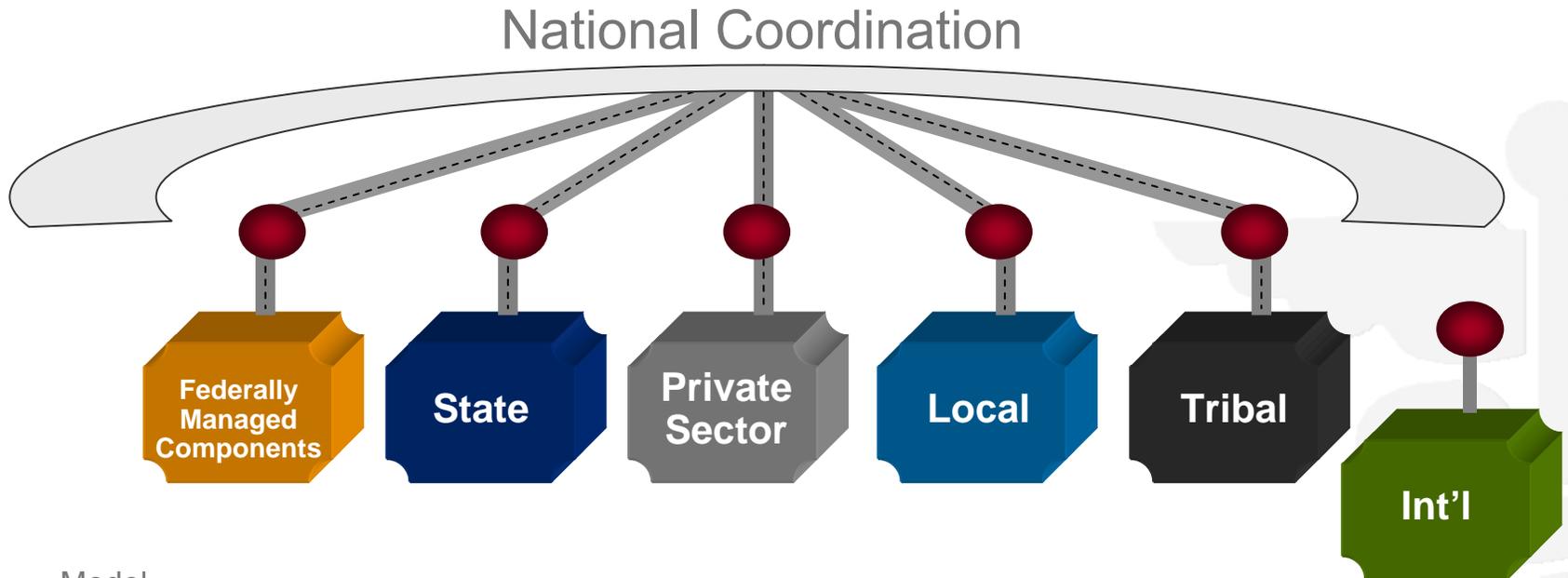
# Respond and Recover

## Decontamination

- Biological attacks can 'contaminate' whole city neighborhoods
- Recovery using current approaches could take decades
- Decontamination and restoration will have to occur in the presence of many uncertainties
- New, pragmatic paradigms are needed
- DHS & DTRA are leading an interagency effort to develop and demonstrate practical near- and mid-term restoration con-ops and protocols in Seattle



# Biodefense Architecture



Model

Federal Direction – Identify the National Architecture



Provides Interoperability for two-way Information Sharing



State/local/tribal Create Solutions Specific to their Unique Needs



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# Coordination Critical at All Levels

## What can you do?

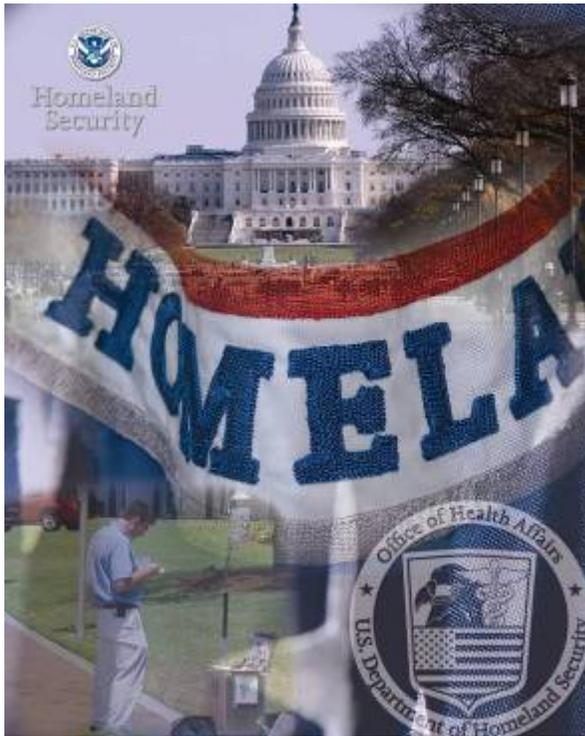
- Provide feedback to DHS.

## What can we do?

- Develop a Strategic Plan for biological events
- Coordinate and streamline funds to ensure a more unified approach to developing preparedness standards.
- Work closely with FEMA, HHS and other interagency partners to ensure a clear strategy



# Questions or Concerns?



Please contact us at:  
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