

Full Scale Terrorism Response Exercises



Lessons Learned from T2

- Plume Modeling

 - T2: Feds use scenario weather; state & local responders use real weather

 - T3: LLNL Modeling Center

- Private Sector

 - T2: Excluded

 - T3: 156 participants, including representatives at both venues & MCC

How to Build a Bioterrorism Scenario ?

1. Choose agent ...

If infectious scenario, then smallpox or plague

2. Choose casualties and fatalities 'desired'

(T3 – final casualty count set at 40,000)

3. Construct a reasonable terrorist – the Universal Adversary – model

4. Construct other parts of model (*& hope they don't conflict with 1, 2, &/or 3*)

Contagious-ness

Basic reproductive rate or secondary transmission rate (R_0)

- If $R_0 < 1$ is considered indicative of an outbreak that is under control
- If $R_0 = 1$ then one infected person will infect one person
- If $R_0 > 1$ is regarded as signifying a spreading outbreak

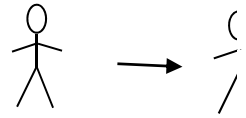
R_0 too low = a model in which disease spread is unrealistically slow and may give a false sense of ease of response and infection control

R_0 too high = unrealistic scenario will result, which overly weighs the threat of one agent

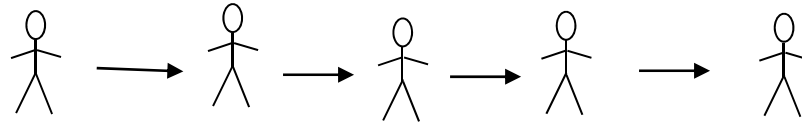
Real world transmissions are often much more complicated than R_0 values convey

Cartoon Representing Disease Transmission

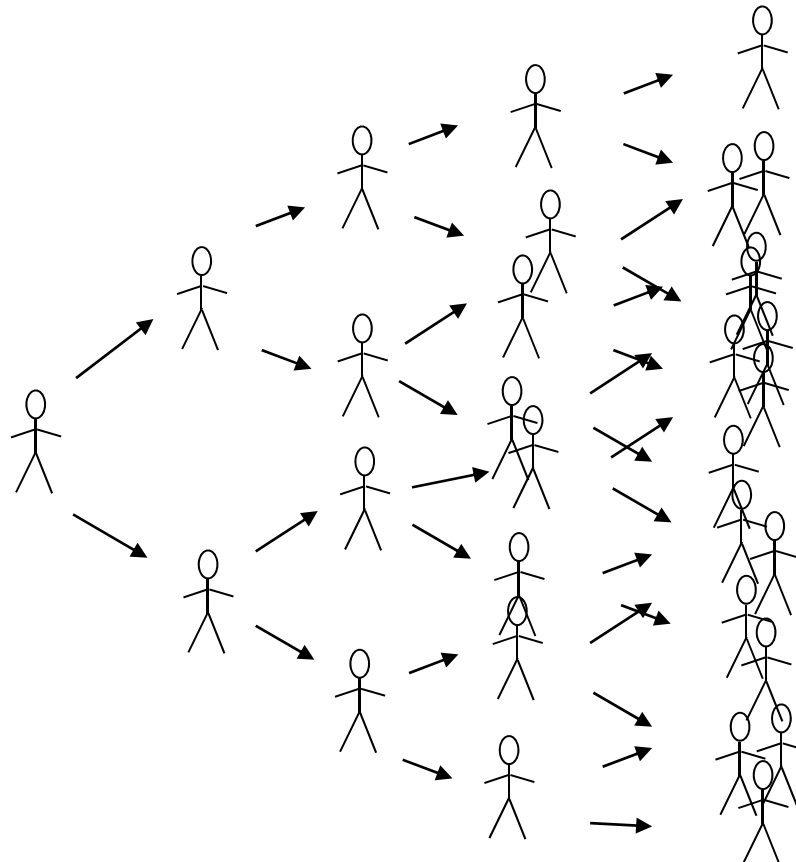
$R_0 < 1$



$R_0 = 1$



$R_0 = 2$



Exponential(!)

Exercises & Smallpox Transmission

R_0

10 **Dark Winter exercise (June 2001)**

3 **Atlantic Storm exercise (January 2005)**

10 - 12 **18th century inner-city London**

10 **1972 Kosovo, Yugoslavia outbreak
(hospital-acquired)**

3.5 - 6 **Historical**

1.8 - 3.2 **Contemporary U.S. population**

Pneumonic Plague

- **Symptoms**

“fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum”

... aka the usual flu-like symptoms

- **Incubation period**

CDC considers the incubation period (time between exposure and onset of symptoms) to be 1-6 d

8 well-documented pneumonic plague outbreaks:

average incubation period = 4.3 d (variance = 1.8)

average infectious period = 2.5 d (variance = 1.2)

T3 Incubation, Diagnosis & Confirmation

- Release 0200 Day -1 (Saturday)
 - 3 SUVs w/improvised sprayers along NJ turnpike
- First symptomatic case appears 0930 Day 0 (Sunday)
 - 31 h after release
- Diagnosis by 1700 on Day 1 (Monday)
 - 63 hours after notional release (~2.5 d)
- Day 3 (Wed) CDC reports confirmation of *Y. pestis* as agent
 - Barely plausible with notional diagnosis*
 - How realistic?*

What does it take to confirm *Y. pestis* ?

Y. pestis is a slow-growing bacterium

Colonies are pinpoint after 24h on SBA

Smaller than other Enterobacteriaceae growing for 24 hours on SBA

May not be visible on MacConkey or eosin methylene blue agar at 24h

Typically, *Y. pestis* cultures are viewed 48-72 hours of incubation

Need secondary CDC-approved confirmation method

Assessments & Implications

T3 Hotwash:

- DHS S&T Directorate
“Medical response capability to plague overly optimistic.”
- HHS & CDC *No comment*

Artificiality of exercise play can lead to a false sense of

- (1) the ease & accuracy of diagnosis,
- (2) the time to symptom onset & spread of infectious agents.

Emergency Laws & Biological Emergencies

- T2 – the Top Officials recognized that plague does not trigger Stafford Act
HHS Sec declared emergency under Public Health Service Act
Problem noted in AAR
- T3 - nothing changed w/r/t Stafford Act
Use DHS HSAS code “red” to federalize response

Long-term Recovery & Remediation (*aka Decon*)

- T2 Only 3 days
 - AARs recognized decon as lacking in exercise
- T3 CT Venue exercise halted 1600 Day 4
 - Decon just coming into play
 - During Hotwash, EPA noted:
 - “Termination inject caused confusion among players who were dealing with the decon of facilities and homes.”
 - Unaddressed issue: dealing with people who “tracked stuff back into their homes.”
 - No consideration of potential long-term health effects (or perceived among “worried well”) of HD exposure (e.g., cancer)

First Responder Observations

- Bob Walsh

Deputy Fire Chief, Hartford CT:

Most useful aspect of T3 was “observing toys”
Hazmat & decon trucks – “Who has what?”

- Mike Weinlein

Assistant Chief of Operations, FDNY:

“Useless”

Lack of transparency, particularly in after-action reports, limits utility

Conclusions

- Balancing need to exercise some response capabilities has pushed construct of models beyond reasonable artificiality.

Making everything FOUO is NOT a meaningful solution!

- Unreasonable artificiality may lead to misconceptions and miscommunications affecting perception of threat and ease of response by policy makers and first responders.
- Decon is an after-thought in exercises.
Whether it's an RDD, anthrax spores or chemical agent, the financial, human and equipment resources required for decon are underestimated and under-emphasized.