

Biopreparedness

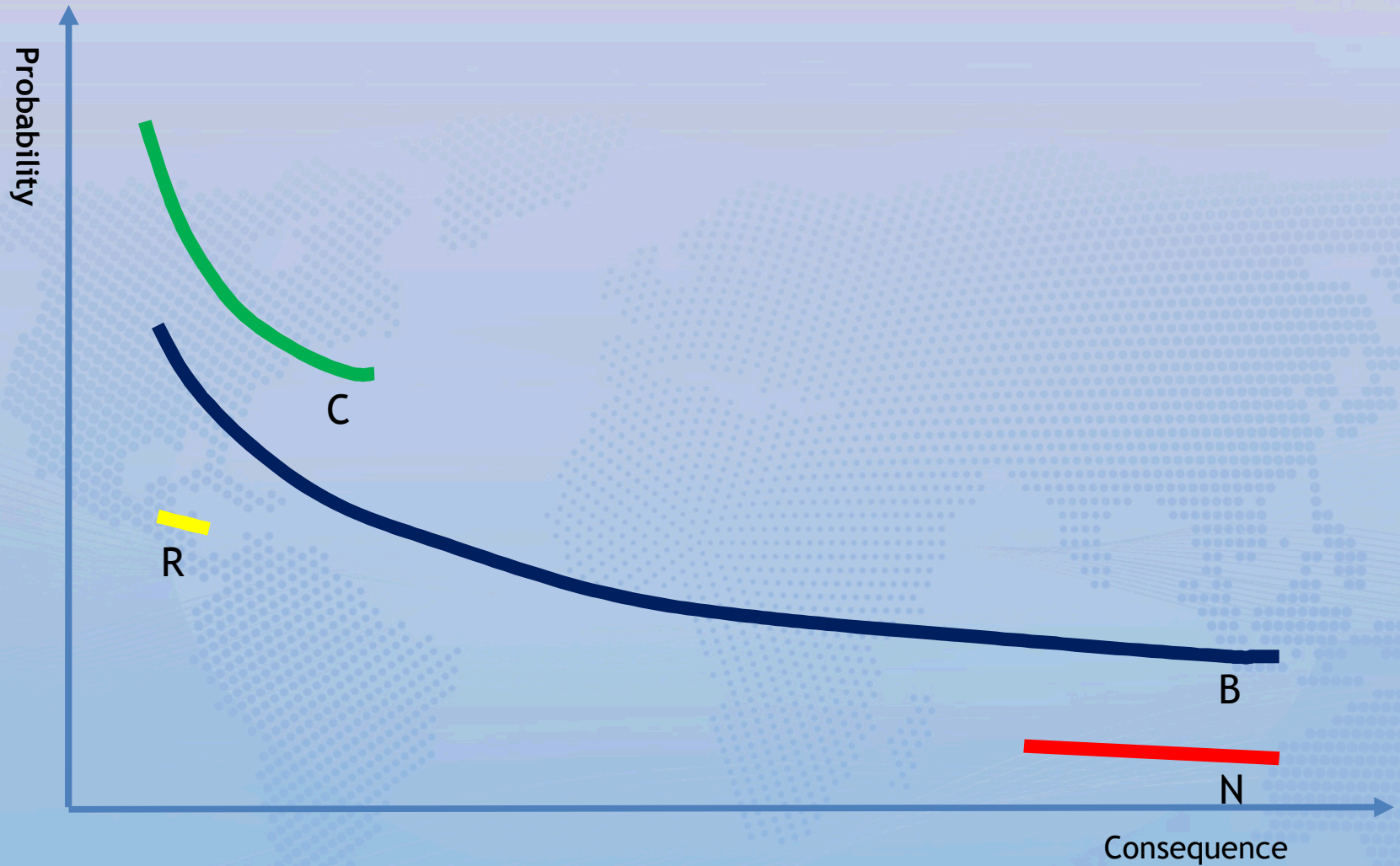
BioICE

Biological Incident Command Exercise

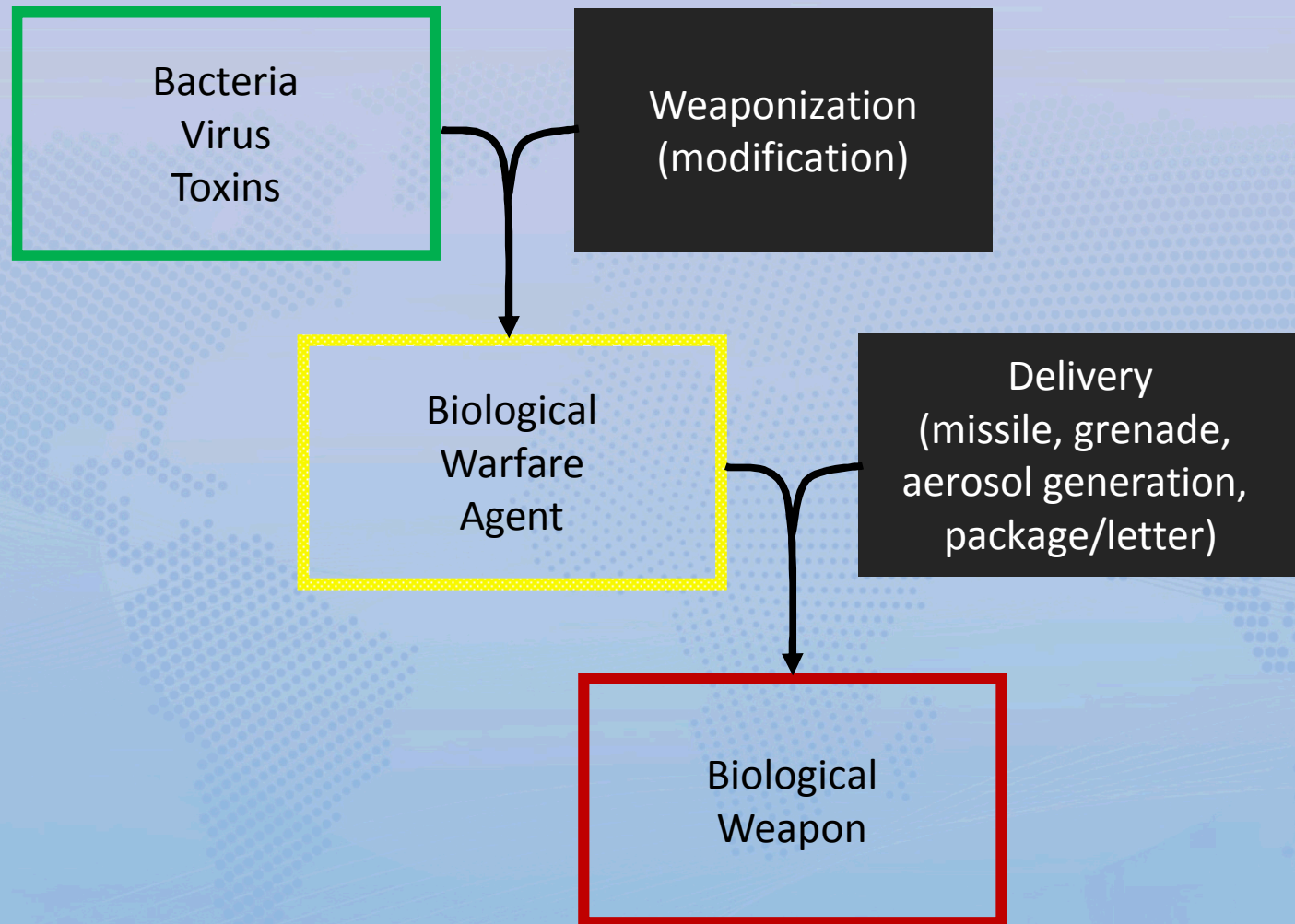
Istanbul, March 29 2011



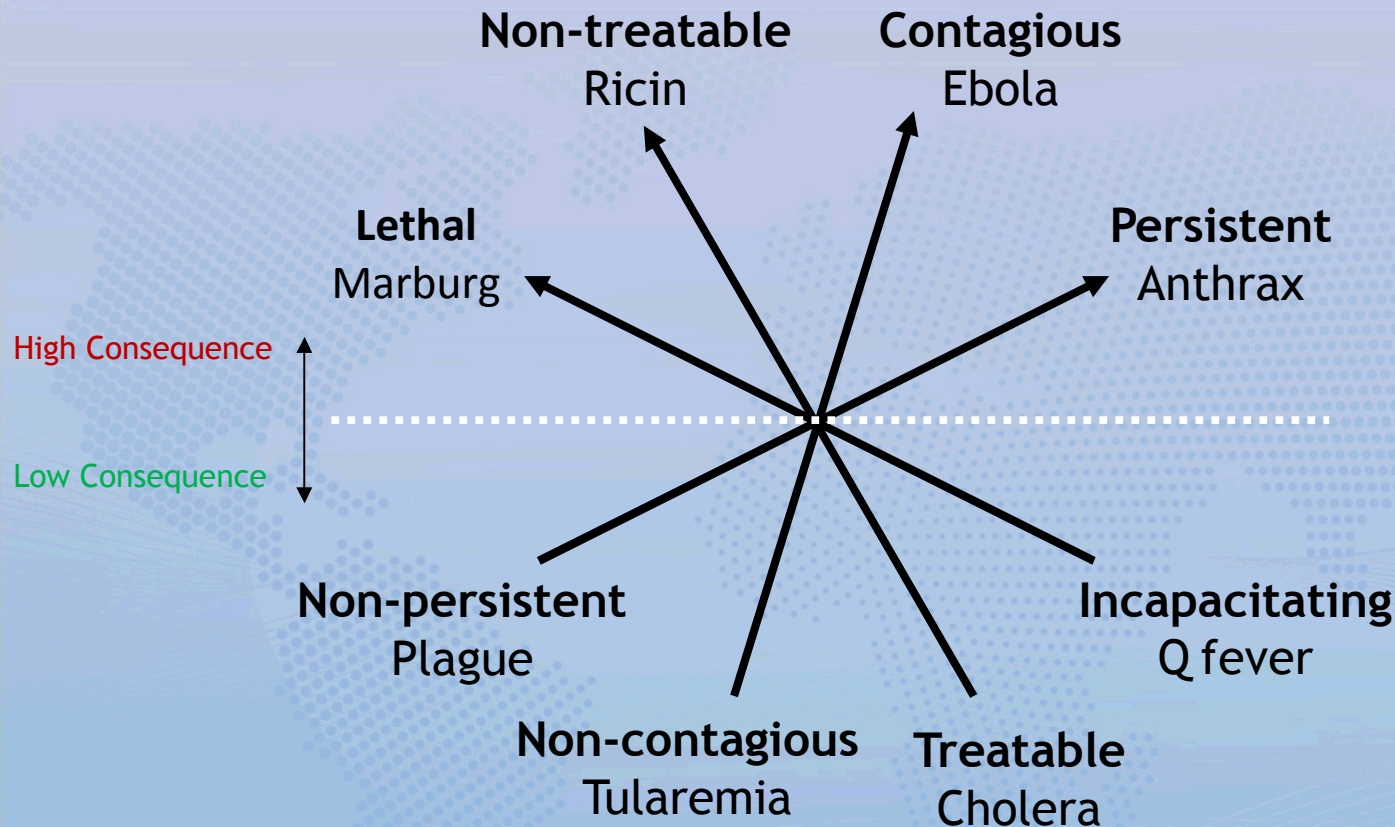
CBRN risk ($R = P \times C$)



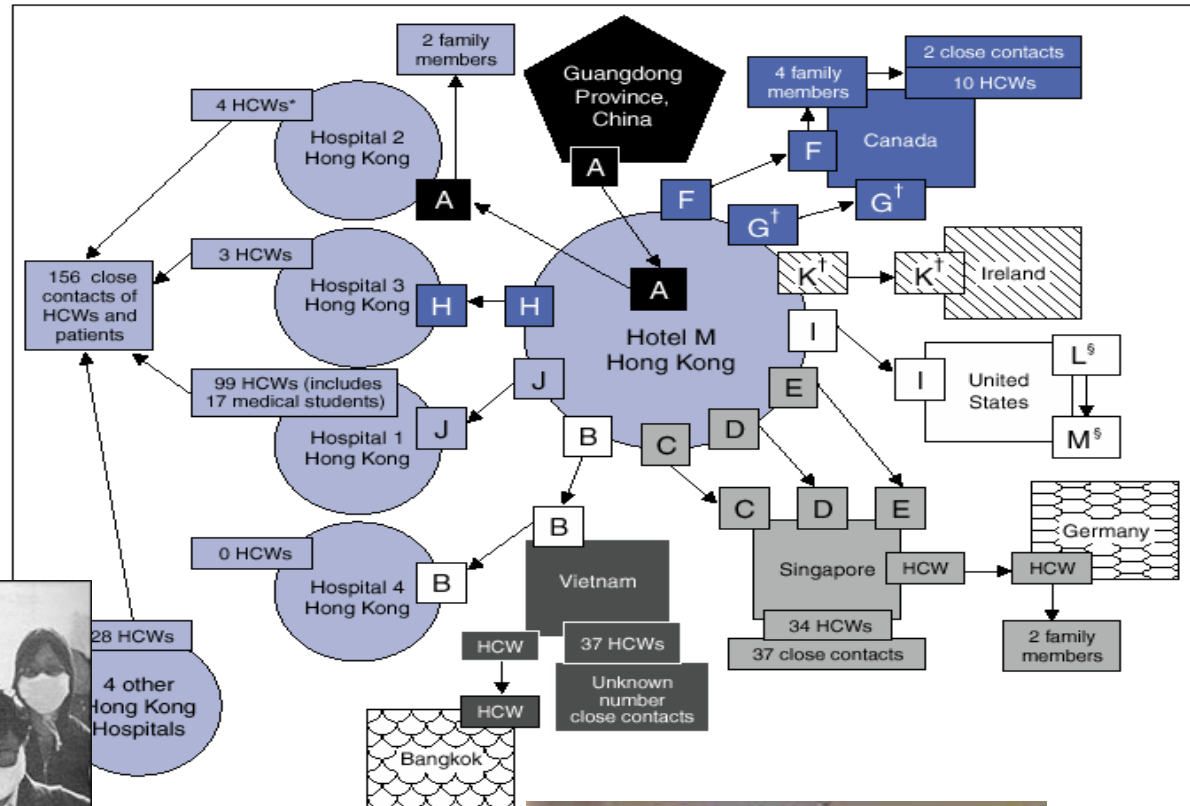
Weaponization Process



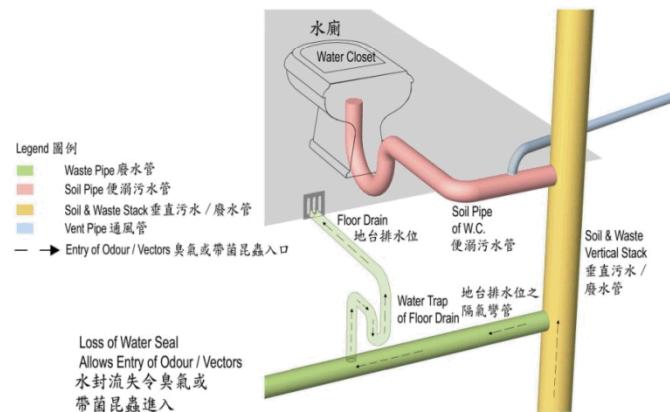
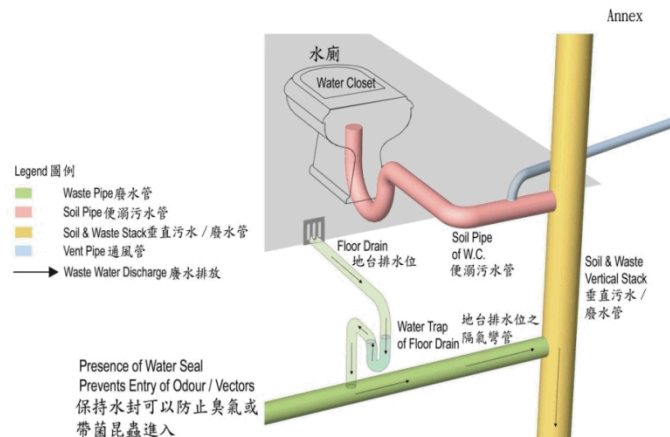
Characteristics of biological weapons



Natural Disease Outbreaks – 2003 SARS



SARS - Amoy Gardens

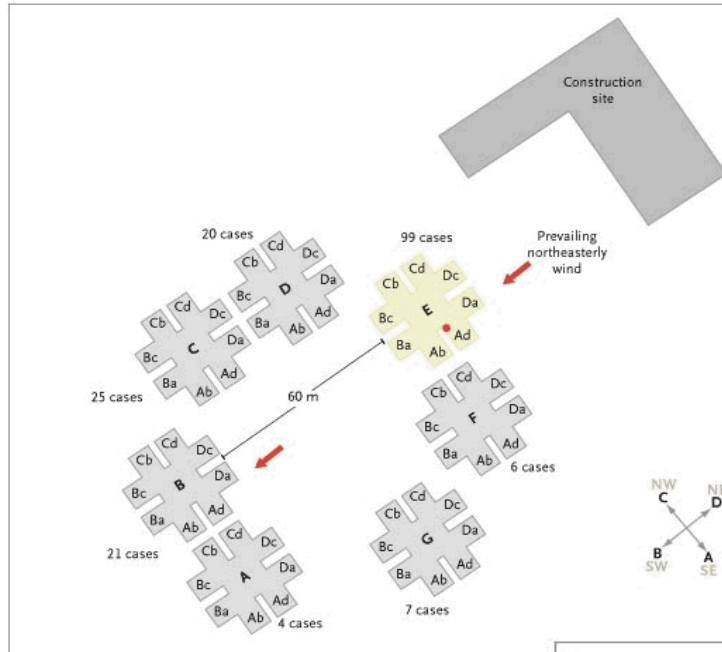


Floor Drains at Amoy Gardens
淘大花園之地台排水位



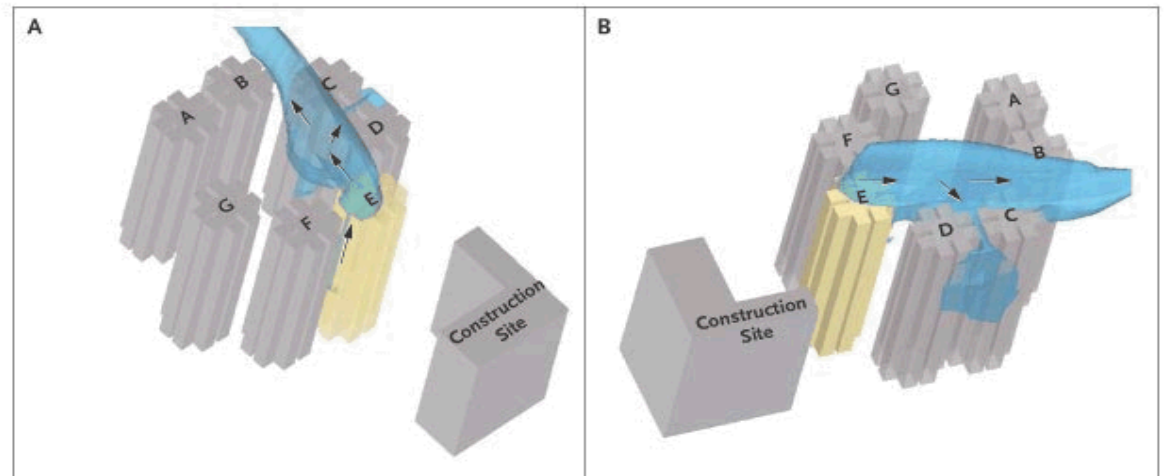
- Index person visiting 14-17 March 2003
- SARS with diarrhea
- Virus in the sewer
- Person-to-person transmission

SARS in Hong Kong

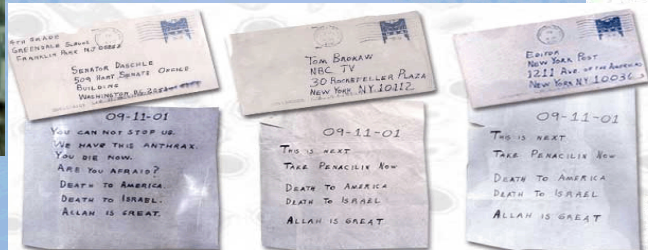
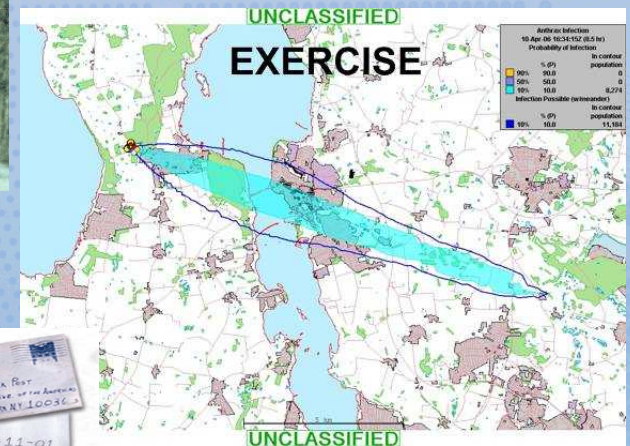
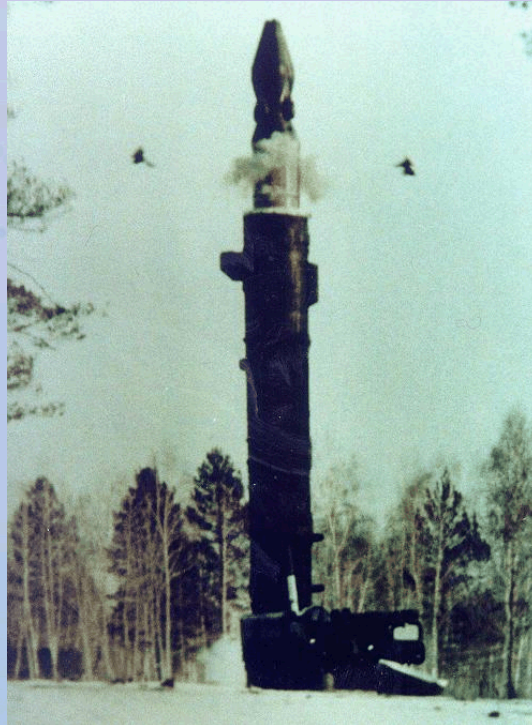


- 321 infected
- Mainly exposed 19 March

Airborne !



BW Dispersal





BW Dispersal



Length of network
408km

Network in tunnels
46 per cent

Tunnel diameter
3.8 metres

Passengers entering rate
146,000 people an hour

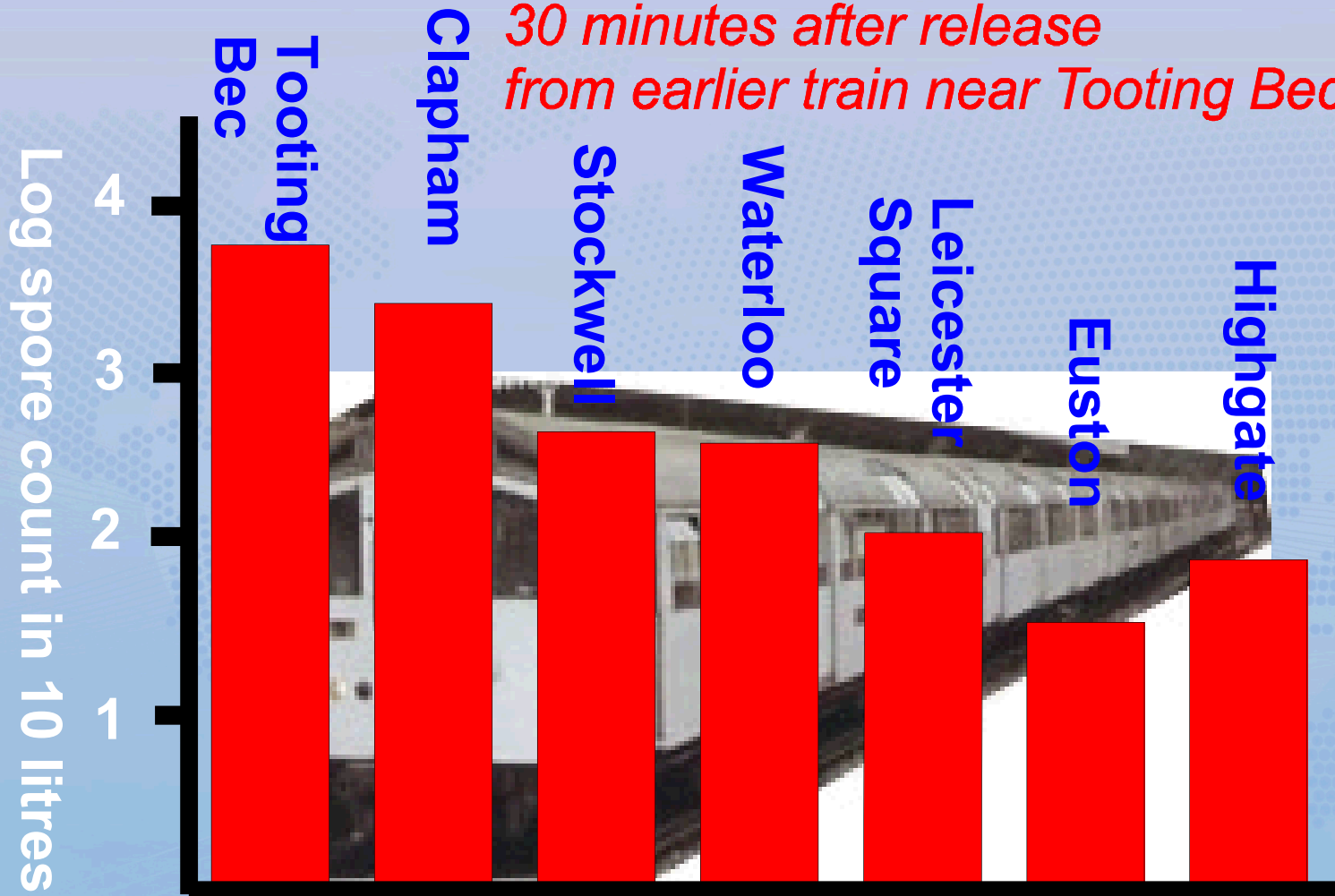
Agent dispersal

16 g *Bacillus globigii*
(8×10^{12} spores)



BW Dispersal

*Spores in train passing through tunnel
30 minutes after release
from earlier train near Tooting Bec*



BW testing

Vozrozhdeniye Island - 1936-1992

Open-air release of smallpox



Smallpox outbreak 1971

Case #1: 11 August, 23 yo, Aralsk, *Lev Berg*

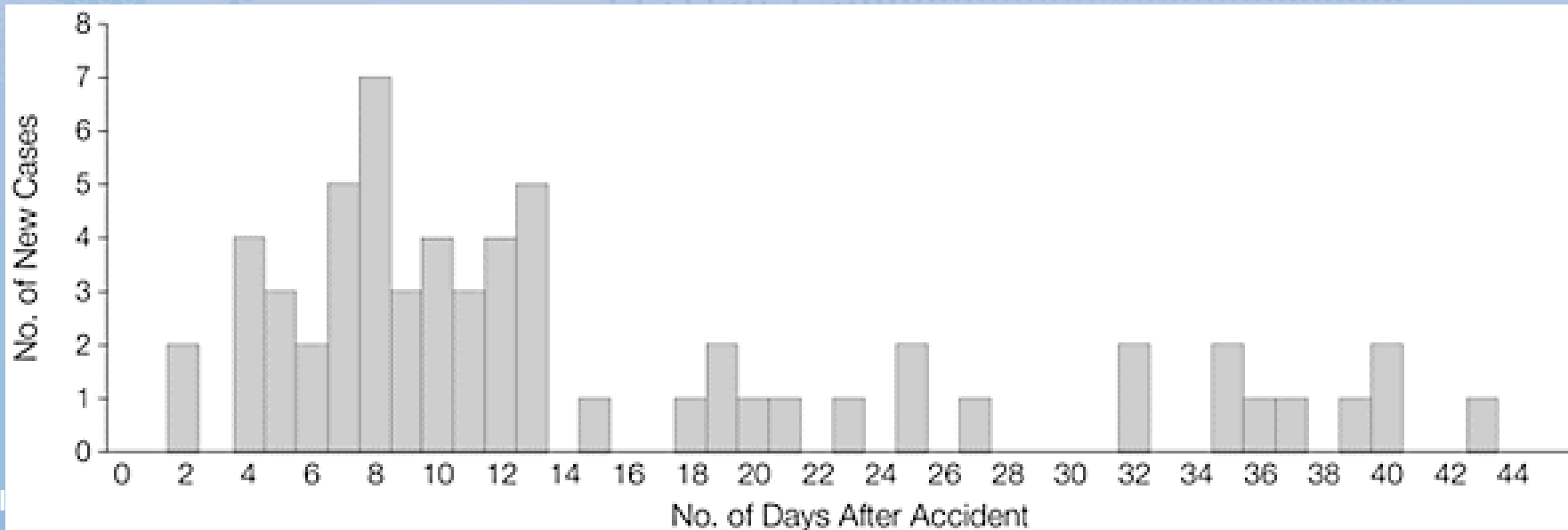
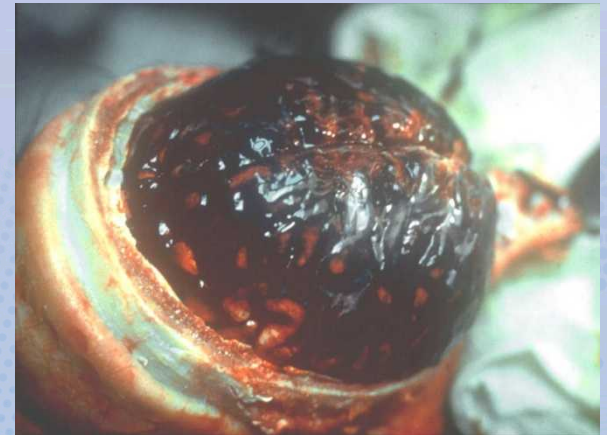
Case #2: 27 August, 9 yo (vacc. 29.01.1963)

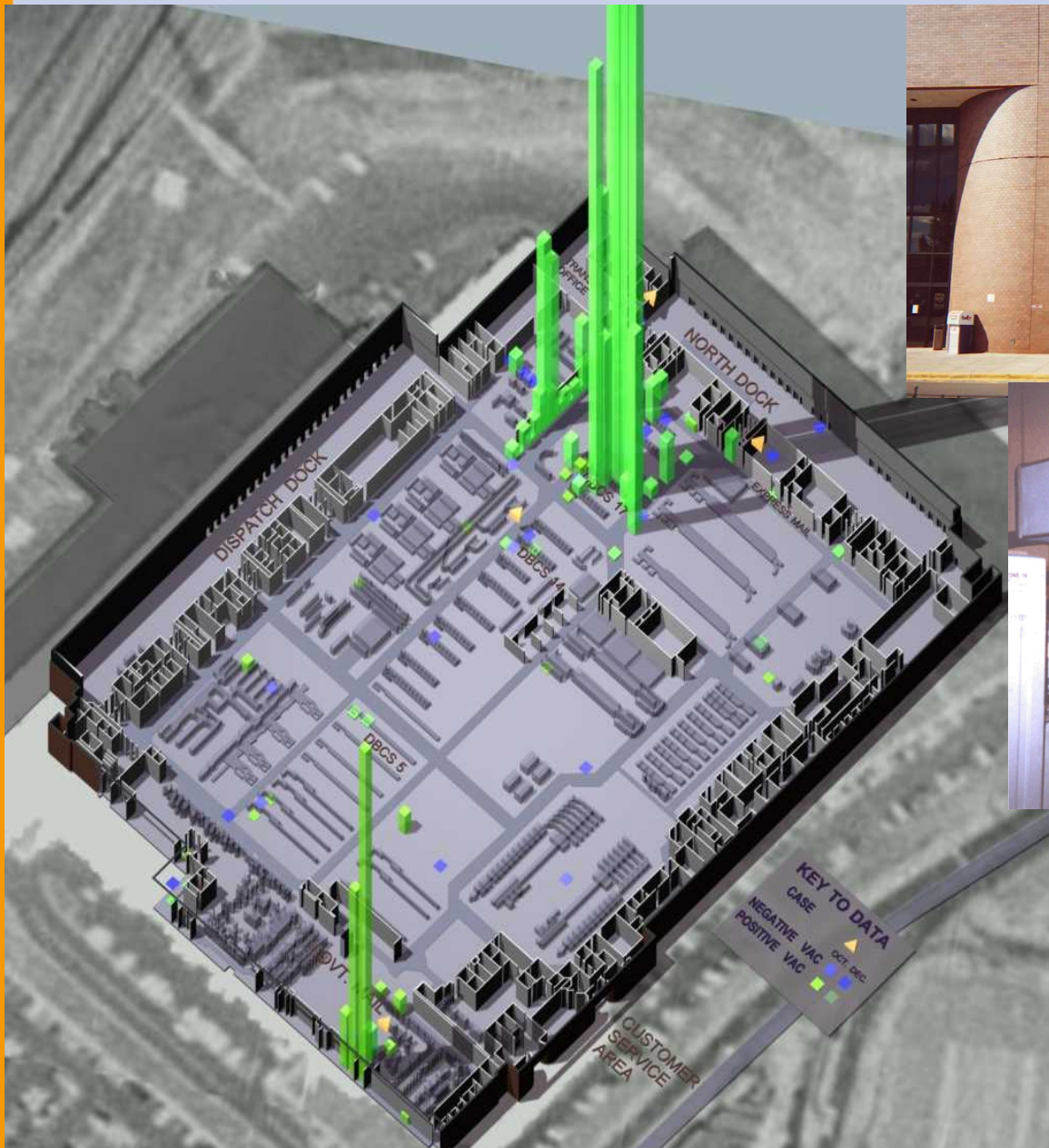
Case #3: 10 September, 24 yo teacher

23 September: Vaccination of 42,899

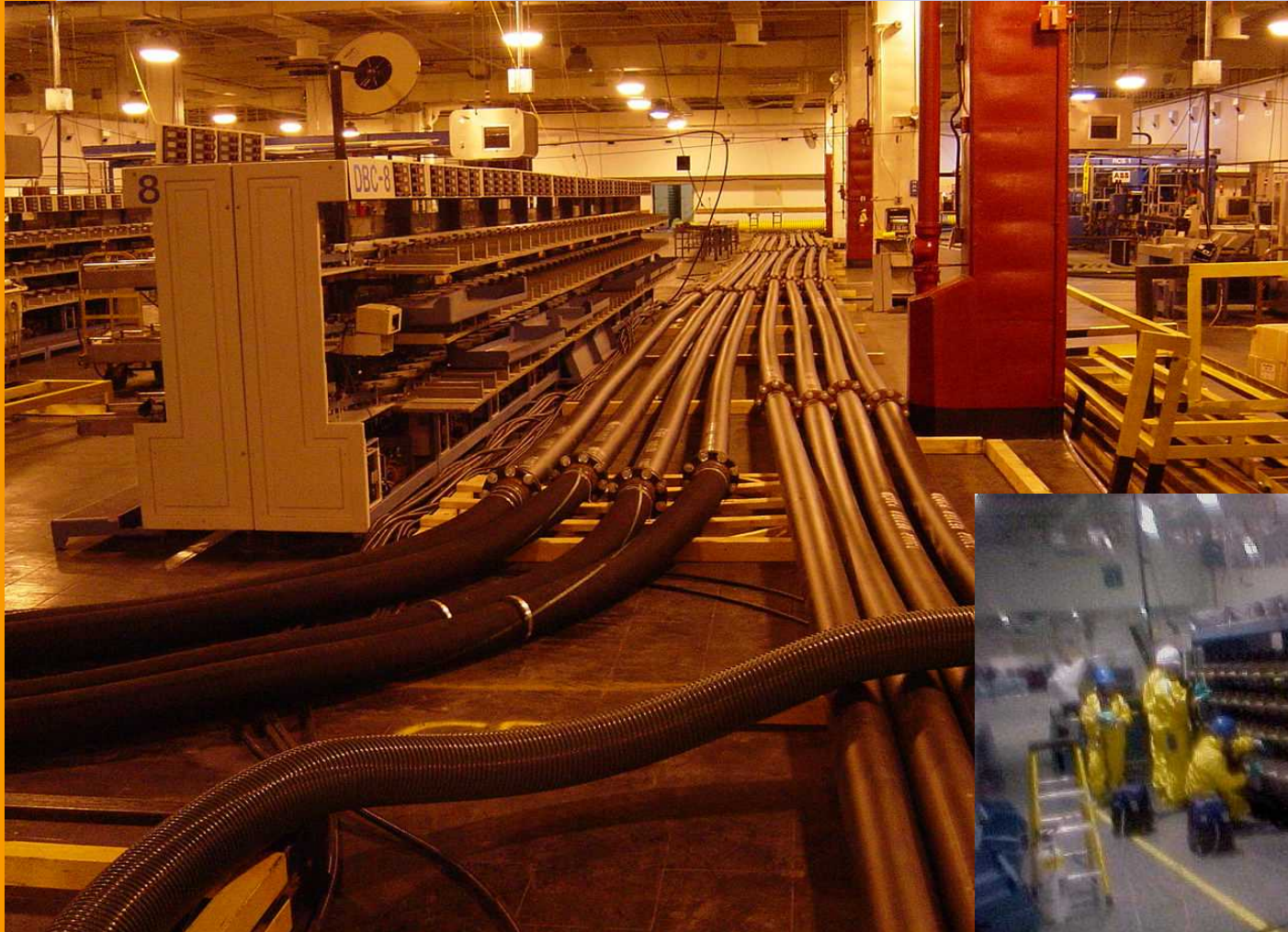
Anthrax – Offensive testing and use

- Gruinard Island, Scotland
- Iraq, Aum Shinrikyo, USA
- South Africa/Rhodesia
- Soviet – Sverdlovsk 1979





Facility Decontamination



Facility Decontamination



Offensive actors

- States
- Terrorist organisations
- Individuals

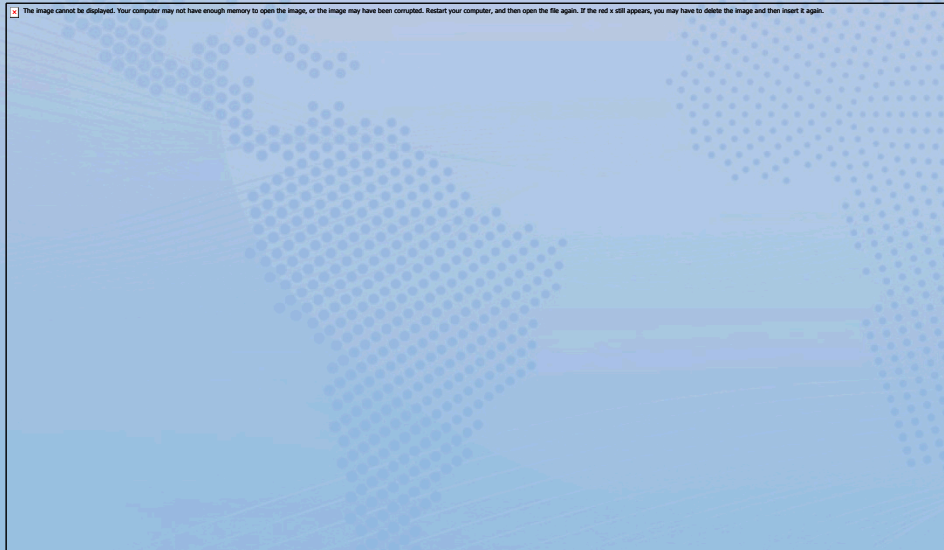


Wouter Basson
*"medicine is my profession,
war is my hobby"*
South Africa's Truth and
Reconciliation Commission (TRC)
April 11, 2002.



Bio Attacks

- Type 1: Suspicious material/object
- Type 2: Outbreak of disease/patients



Bio Attack - Type 1 Phases

Alert

- Threat assessment

Incident response on crime scene

- Cordon off, evacuation, registration
- Sampling

Analysis

- Analysis at certified lab
- Rapid analysis?

Consequence management

- Negative: Police investigation
- Positive: Treatment, isolation, quarantine



Type 1 - investigational assets



Bio Attack - Threat assessment

- Other attacks?
- Exposed individuals?
- Known actor?
- Known warfare agent?
- Sensitive target?
- Dispersal method?
 - Passive aerosol
 - Active aerosol dissemination
 - Water
 - Food
- Incident reporting

Decision to deploy



Prioritize investigation



Recommendations on countermeasures

Investigation and Sampling

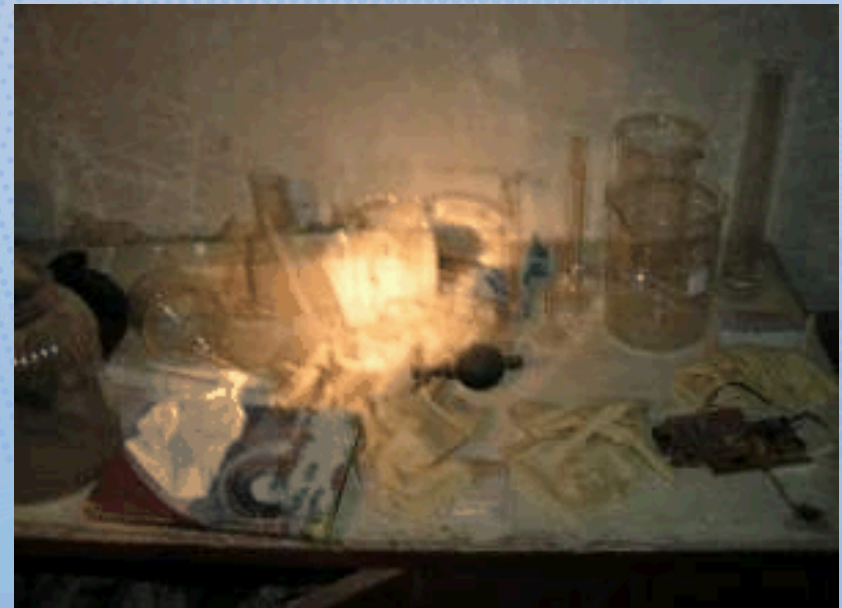
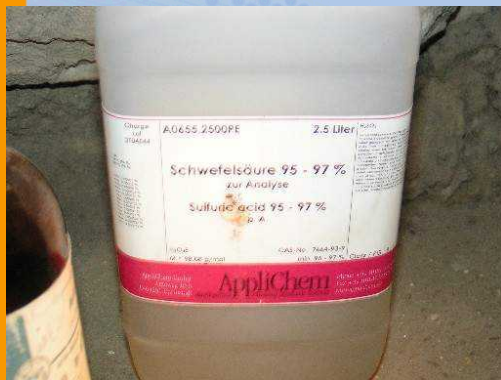


Falluja - Operation Al Fajr - Nov 2004
1st Marine Division 1/8 Alpha Company 3rd Platoon

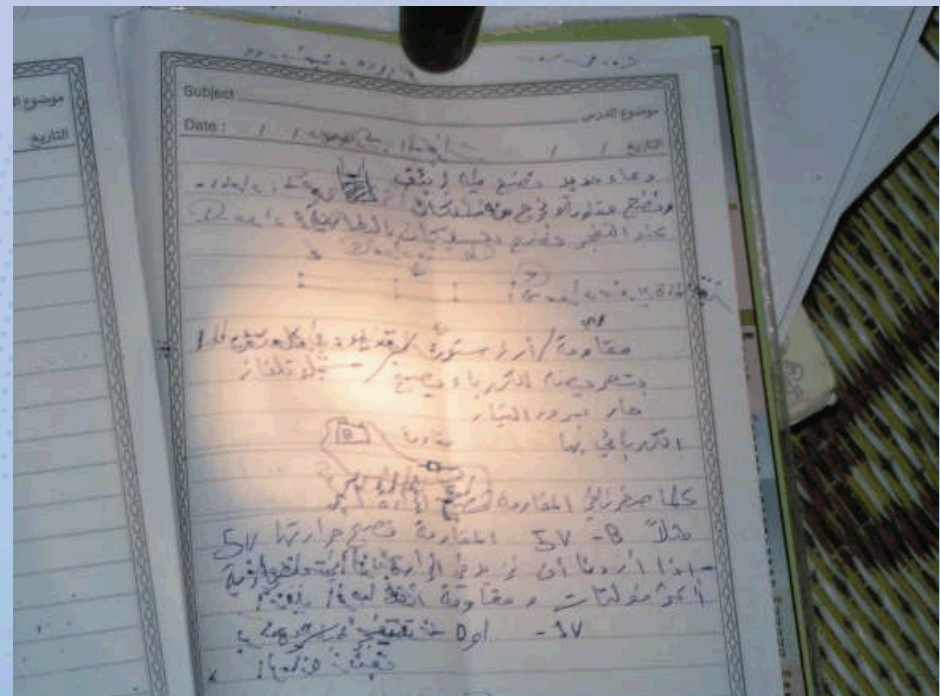
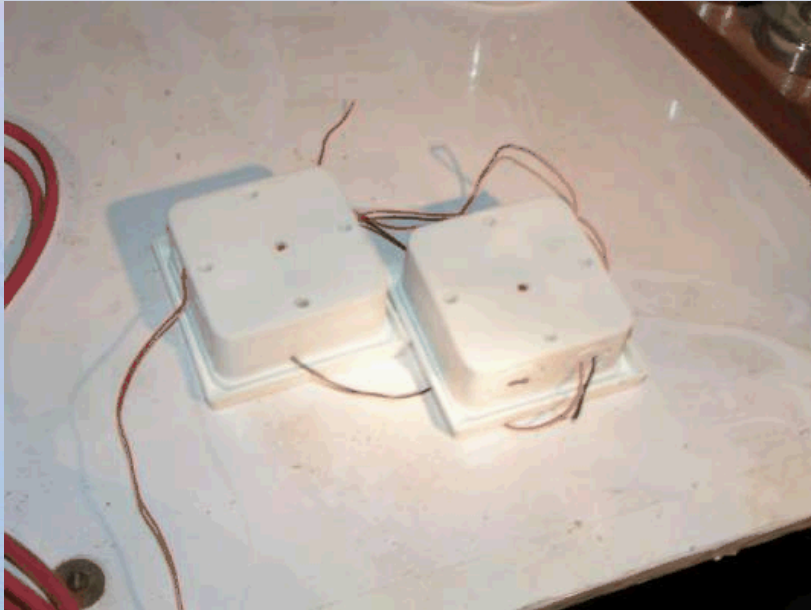


Combat Camera Imagery

Investigation and Sampling



Investigation and Sampling



IED



Cleaning vs. Decontamination

Cleaning



- Wash and change of clothes for exposed individuals
- Water and soap

Decontamination

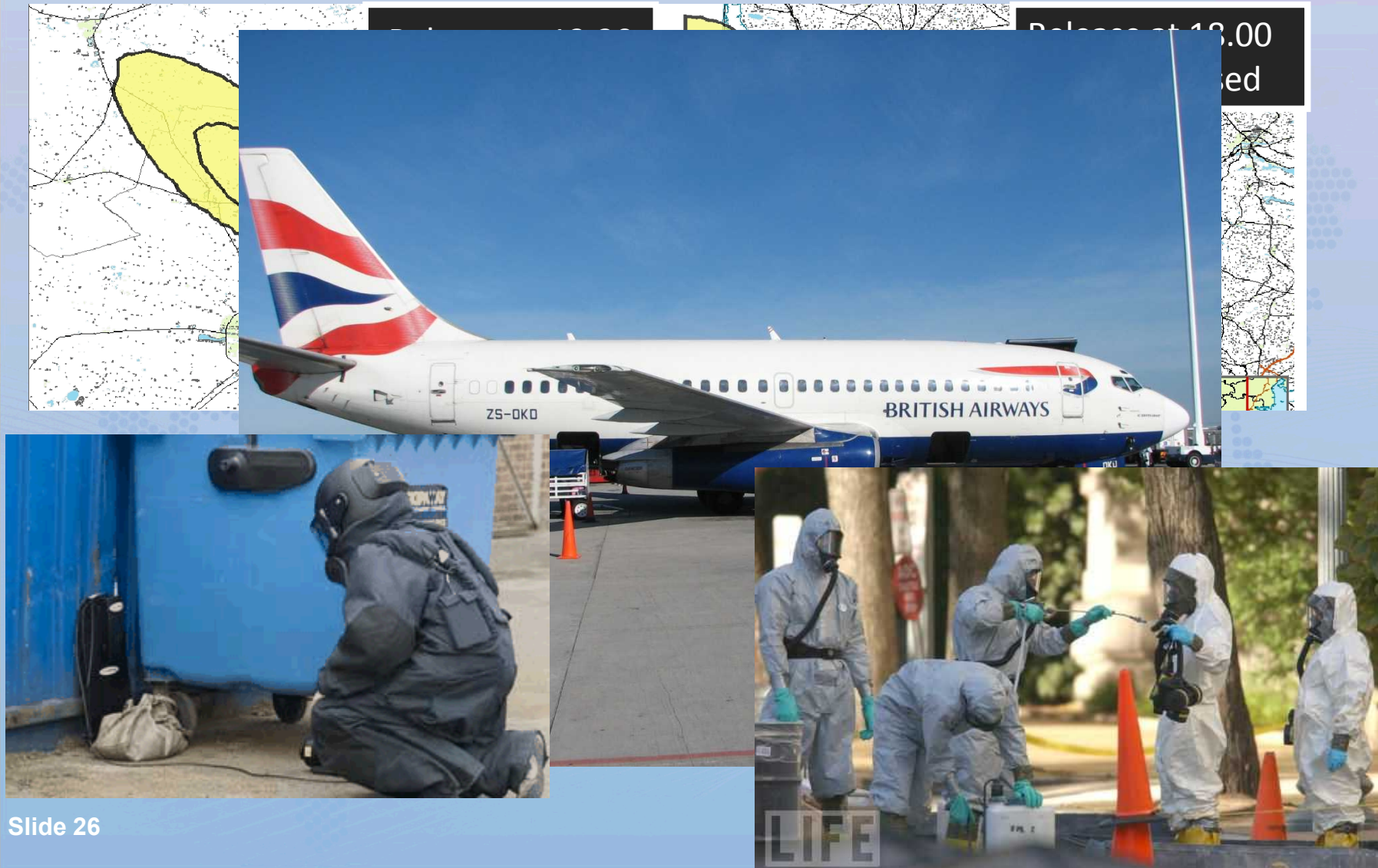
- Disinfecting non-infected personnel
- Use of chemicals (chlorine)



Type 2 Incidents – Outbreak Signatures

WHO	FACTOR	WHEN
Epidemiologist/ public health	 Admissions Deaths	Late
Clinical labs	More samples Unusual samples	Late Early
Pharmacies	 Prescriptions OTC	Late
Mortician	More burials	Late
Vets	Disease and deaths among animals	Early (natural) Late (deliberate)
Clinicians	Unusual or rare diseases	Early

Incident Reporting - Full-Scale Exercise Example



Incident Reporting - Full-Scale Exercise Example

Situational assessment

- Possible bio-bomb
- Unknown pathogen
- Exposed for 1-2 d
- Contagious?
- 60,000 exposed
- Countermeasures:
Treatment?
- Prophylaxis?

Prognosis

- Contagious following onset of symptoms
- Incubation?
- Improved survival if rapid treatment
- Casualty estimate without treatment: ?
- Contamination: Airport and plume area

Recommendations

- PPE
- Prophylactic treatment of 1st liners
- Cohort isolation
- Dedicated diagnostics
- Countermeasures stockpiled, distributed and administered
- Triage
- Quarantine
- Hotline
- Press



Bioterror essentials

- Security overrules health
- Avoid additional dissemination
- Avoid continued exposure
- Sampling and analysis has top priority
- Incubation period = not contagious



Biopreparedness

Surveillance

Investigation

Countermeasures

