

Biothreat-related Myths

- To be prepared I must buy a gas mask and a HAZMAT space suit
- Antibiotics and vaccines will protect everyone; having antibiotics around “just in case” is a good idea
- Technology will solve all our problems
- All biological agents are contagious
- A local event is not a national event, only if it happens locally it will affect me directly
- It's easy to spray biological or chemical agents over a large area
- It's easy to contaminate a water supply
- I'm a mother, I can easily handle the anxiety of an attack
- The authorities have a plan for all contingencies
- If something happens, I should head right to the nearest hospital
- My doctor will always know what to do
- An attack with biological or chemical agents will cause more injuries and deaths than cancer or heart disease
- Smallpox is the most contagious and deadly organism known to man

Biological Weapons: *Threat and Response*



Peter Katona, MD, FACP
Associate Professor
UCLA School of Medicine

Topics

- Background and history
- The agents and their properties
- International bioweapons programs
- Effects on the economy & int'l business
- Preparedness & countermeasures



Some Facts

Only 2% of the 14,000 cargo containers entering the US every day are inspected!

There are 850,000 facilities that store ingredients for chemical agents

There are 103 nuclear power plants

“Terror” comes from the Greek word *trein* which means “to be afraid, flee” and *tremein* which means “to tremble”



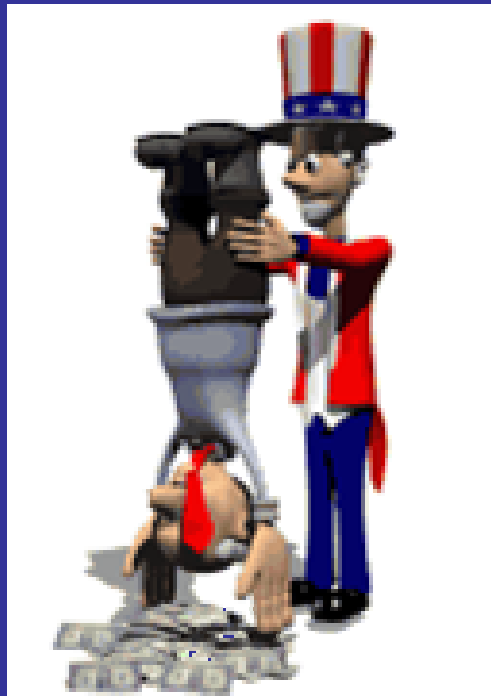
Bioterrorism

The *intentional* use of microorganisms or their toxins to produce death or disease in humans, animals, or plants.

Biological warfare and terror are not new. The fundamentalists, fanatics & extremists were always around.

What is new is the potential to use it on an UNPRECEDENTED SCALE with today's technology, misinformation, religious fervor, and lack of restraints.

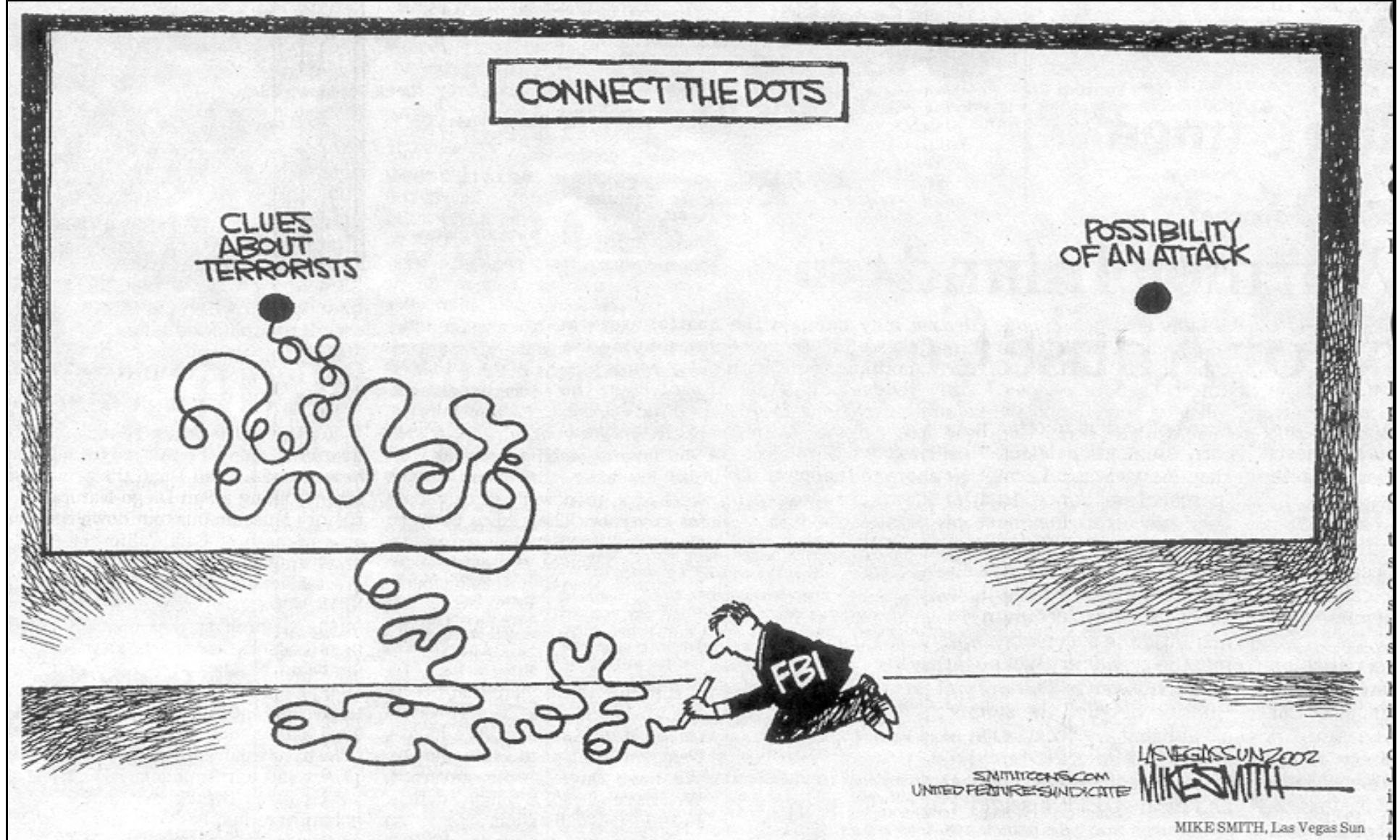
What is our risk?



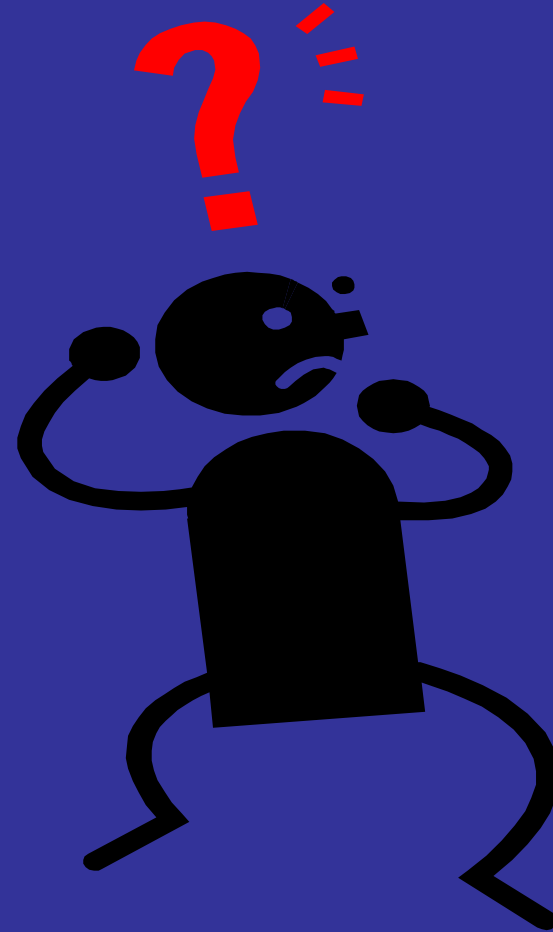
Risk = intentions + indications +
vulnerabilities + resources

Magnitude is inversely
proportional to likelihood

The US Terrorism Threat Integration Center



A Question:



Will the first response to a bio/chem/radiological terror attack be this?



.... or this?



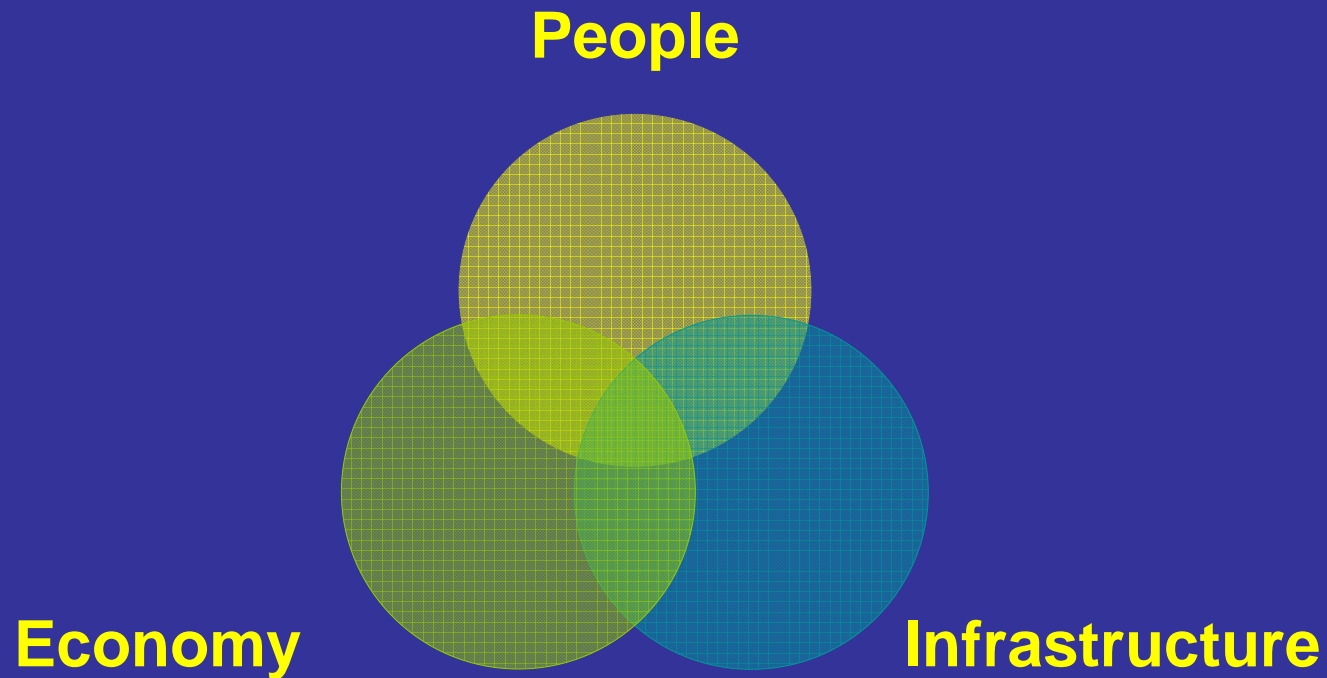
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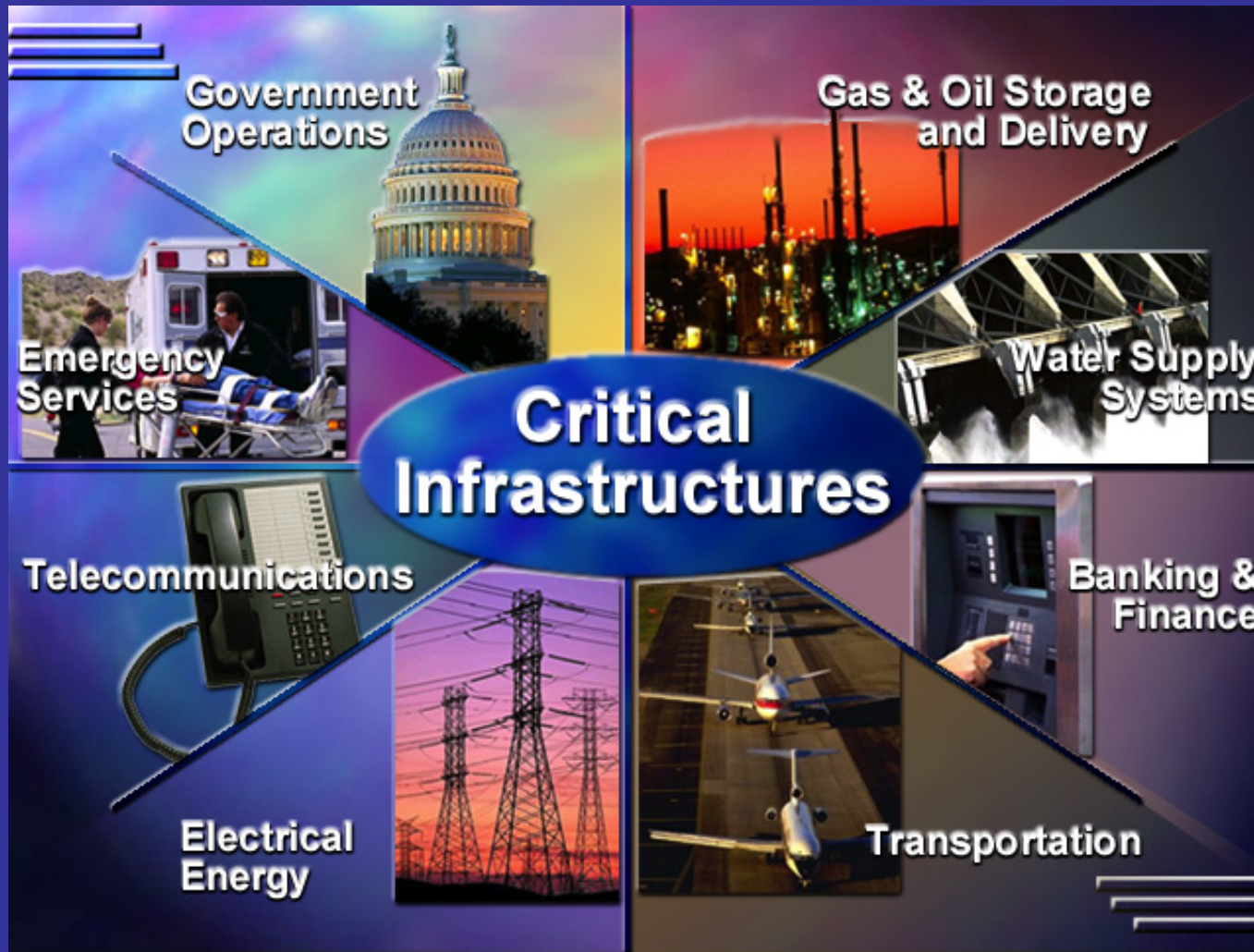
...or this.



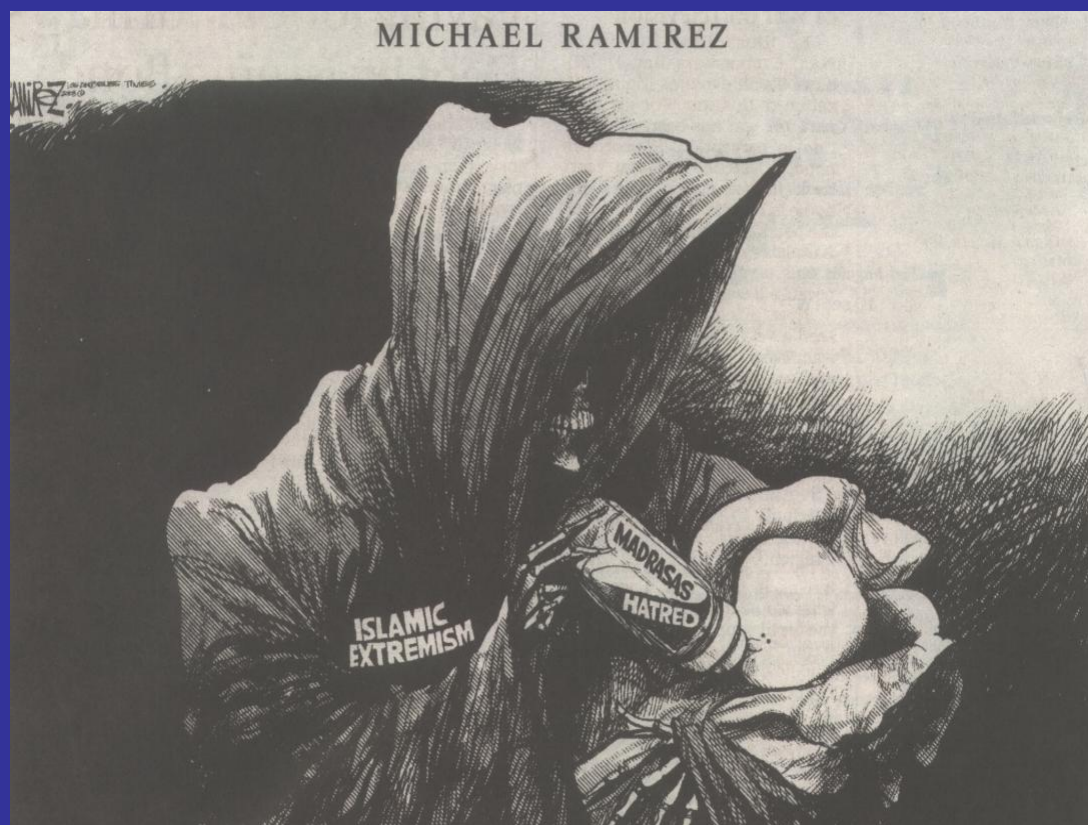
Who and what will be targeted?



Protecting Critical Infrastructures



There were warnings prior to September 11, 2001



1979: The Rise of Islamist Terrorism

- **The Iranian Revolution**
- The Soviet invasion of Afghanistan
- The brief but bloody takeover by militants of the Grand Mosque in Mecca

1995:

Events in Asia, the Middle East and the US

- The Aum Shinrikyo sarin gas attack in the Tokyo subway
- The defection of Saddam Hussein's son-in-law
- The Oklahoma City bombing
- The defection of Ken Alibek

"Every age has its own kind of war, it's own limiting condition, and it's own peculiar preconceptions."

Karl von Clausewitz
Prussian philosopher



Why worry about all this?



terrorists now have the
technology to do what
only the military could do
before



A Convergence of Global Security Concerns

- **Terrorism** & global insurgency is on the rise
- **WMD** proliferation
- **Asymmetric global networked warfare**
- Conflicts between nations & with rogue competitors or "market states"
- Transnational organized crime & corruption
- **Emerging and re-emerging infectious diseases**
- **Malevolent use of advanced technology**
- Transitions of systems
- A new variety of religious actors that lack any constraints

Post-Modern Terrorism

- Blurring the distinction between crime & war
- Weapons of
 - **Mass Destruction (WMD)**
 - **Mass Disruption**
 - **Mass Morale Destruction**
- New emerging threats and targets
 - **Information systems**
 - **Influenza, SARS, WNV**

**"The only difference
between reality and
fiction is that fiction
has to make sense."**



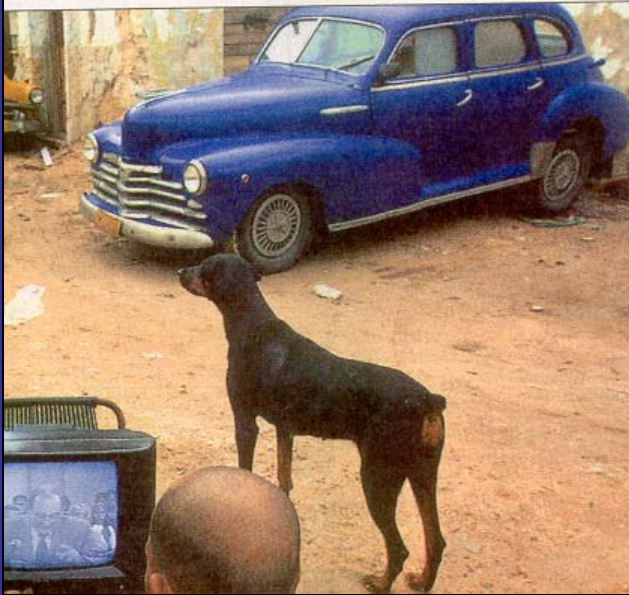
Tom Clancy

Are we in a crisis?

Angeles Times

TUESDAY, MAY 21, 2002

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FBI Expects Suicide Bomb Attack in U.S.

Security: Agency chief Mueller says terrorist acts similar to those in Israel are 'inevitable.' The concerns are prompted by a flood of recent intelligence.

not comment on the accuracy of the remarks, which were reported by Associated Press.

Mueller's remarks were confirmed by a Justice Department official, who also said authorities believe the threat of such a suicide bombing attack in the near future is very real, and based on an accumulation of recent intelligence.

"We don't know when," said the
Please see FBI, A18

By JOSH MEYER

Los Angeles Times May 21, 2002

The Chinese depict the word “crisis” with two pictograms



Chinese symbol for danger.



Chinese symbol for opportunity.

Weapons of Mass Destruction (WMD, NBC, CBRNE)

- Nuclear (and radiological and EMP)
- **Biological**
- Chemical
- Firearms, Explosives or Incendiary Devices
- Cyberterror



Bioterrorism: CDC Classification

Category A:

- Top Priority
- Easily disseminated or transmitted
- High mortality
- Causes social disruption
- Special preparation needed

The Agents:

- Anthrax
- Botulism
- Plague
- Smallpox
- Tularemia
- Viral Hemorrhagic Fevers

Bioterrorism: The Agents

Category B

- Q Fever
- Brucellosis
- Viral encephalitides
- Staphylococcal enterotoxin B
- Food/Waterborne
- Ricin

Category C

- Nipah virus
- Hantavirus
- Tickborne hemorrhagic fever
- Yellow fever
- Multidrug-resistant TB

The Outliers

- **Anthrax** - extremely stable
- **Smallpox** - highly contagious
- **Ricin** - widely available
- **SARS** - woman from HK infected 155 people
- **Influenza** - look at 1918, avian flu
- **Foot and mouth disease** - extremely contagious & easy to get

Bioweapons:

The hierarchy of what we worry about

1. Highly contagious human viruses (difficult to acquire)
2. Foreign animal contagious viruses (available and easy to use)
3. Classic bioterror agents (difficult to prepare and deliver but can be bought)
4. Hundreds of other misc. agents (all having some weaknesses)
5. Genetically engineered agents

Agriculture in America

- We use 11% of our income for food
- \$160 billion economy
- 60% cattle
- Last FMD outbreak was in 1929
- \$14 billion cost to California of 1 case of FMD

Types of Biological Events

- **Intentional attacks**

- Example: Rajneeshee cult incident

- **Public health emergencies**

- Example: Plague, smallpox

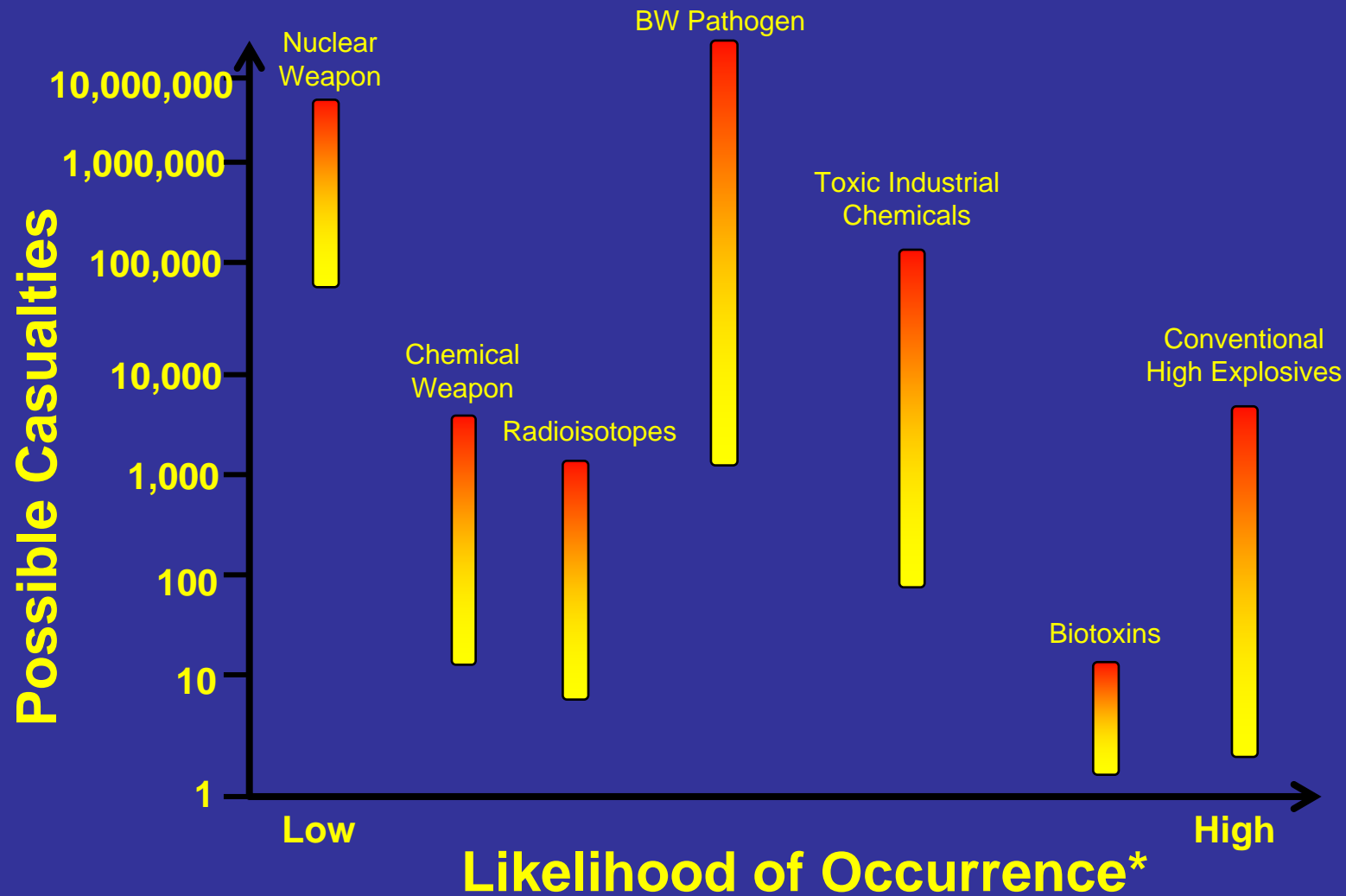
- **Accidental releases**

- Example: Sverdlovsk, U.S.S.R.

- **Natural outbreaks**

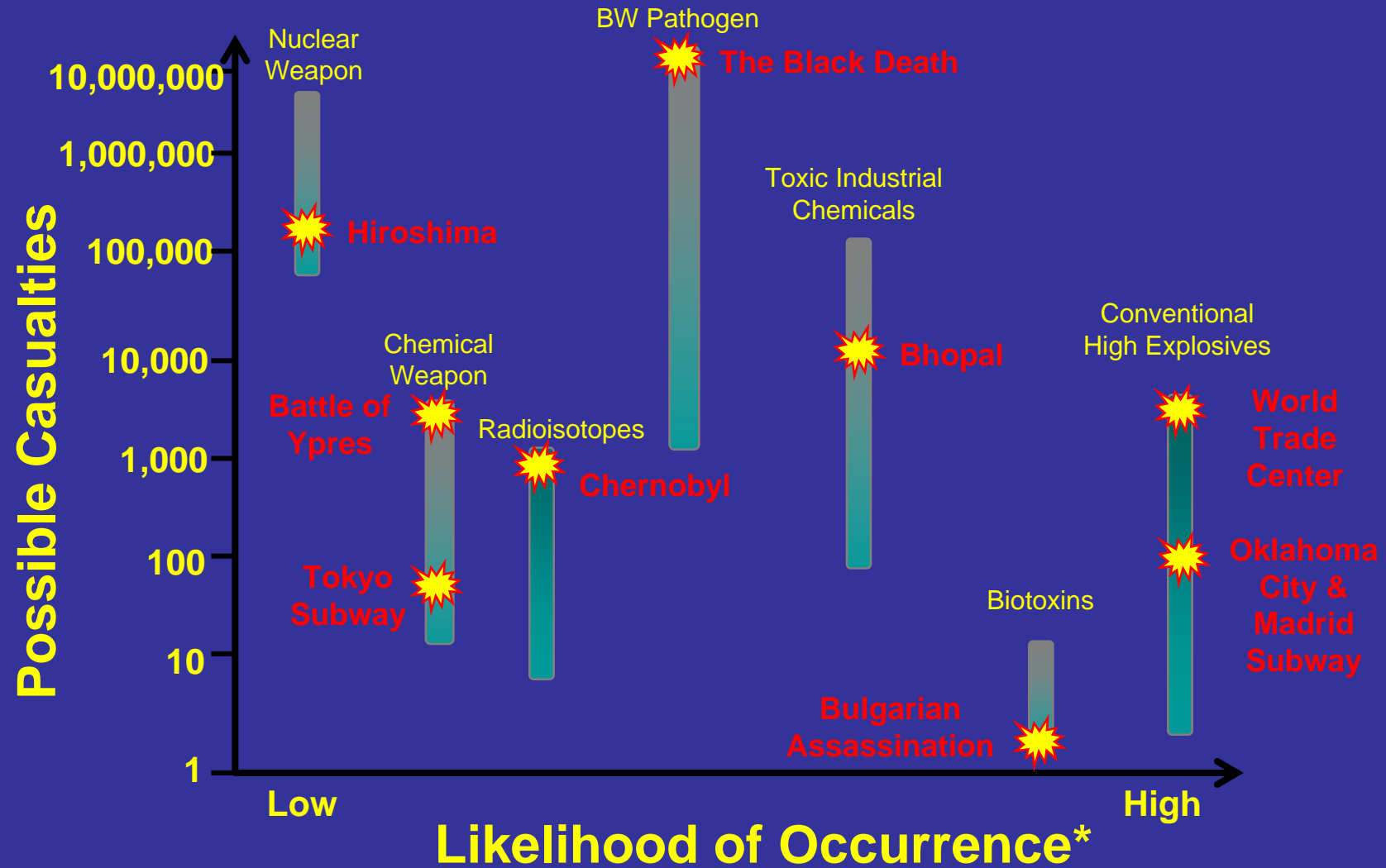
- Example: West Nile Virus, SARS

The WMD Threat Spectrum



* Per FBI Threat Briefing, October 2, 2000

Historical Precedents



Properties of Biological Weapons

- Relatively cheap and easy to make or procure in large quantities with production technology “recipes” easily available
- Detection is difficult – tasteless, odorless, silent, invisible – not detected by the 5 senses
- Air dissemination possible at great distance in 1-5 micron aerosol
- Enclosed spaces are ideal – sporting events, subways, convention halls or mail rooms
- Delayed onset
- May be undetectable until there are numerous insidious casualties

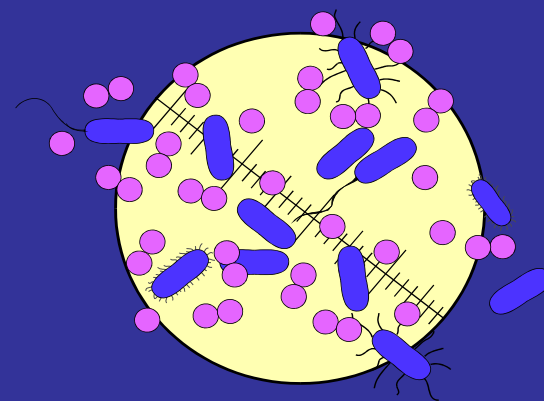
Methods of Dissemination

- Using people as carriers
- Via missile
- Covertly



How can biologic weapons be deployed covertly?

- Contaminating **food or water** supplies
- Releasing infected **vectors** (mosquitoes, fleas)
- Creating an **aerosol** cloud to be inhaled by victims
- Sending a **letter** through the mail (aerosol & skin)



Where & when is our risk?

- Subways & other public transit places
 - Tokyo
 - Madrid
 - New York
 - Buses in Israel
- Any large venue of people
 - Sporting or entertainment event
 - Convention
 - A shopping mall or movie theater
 - The Olympics
- Politically timed to attract attention

Let's Look at Weapon Cost

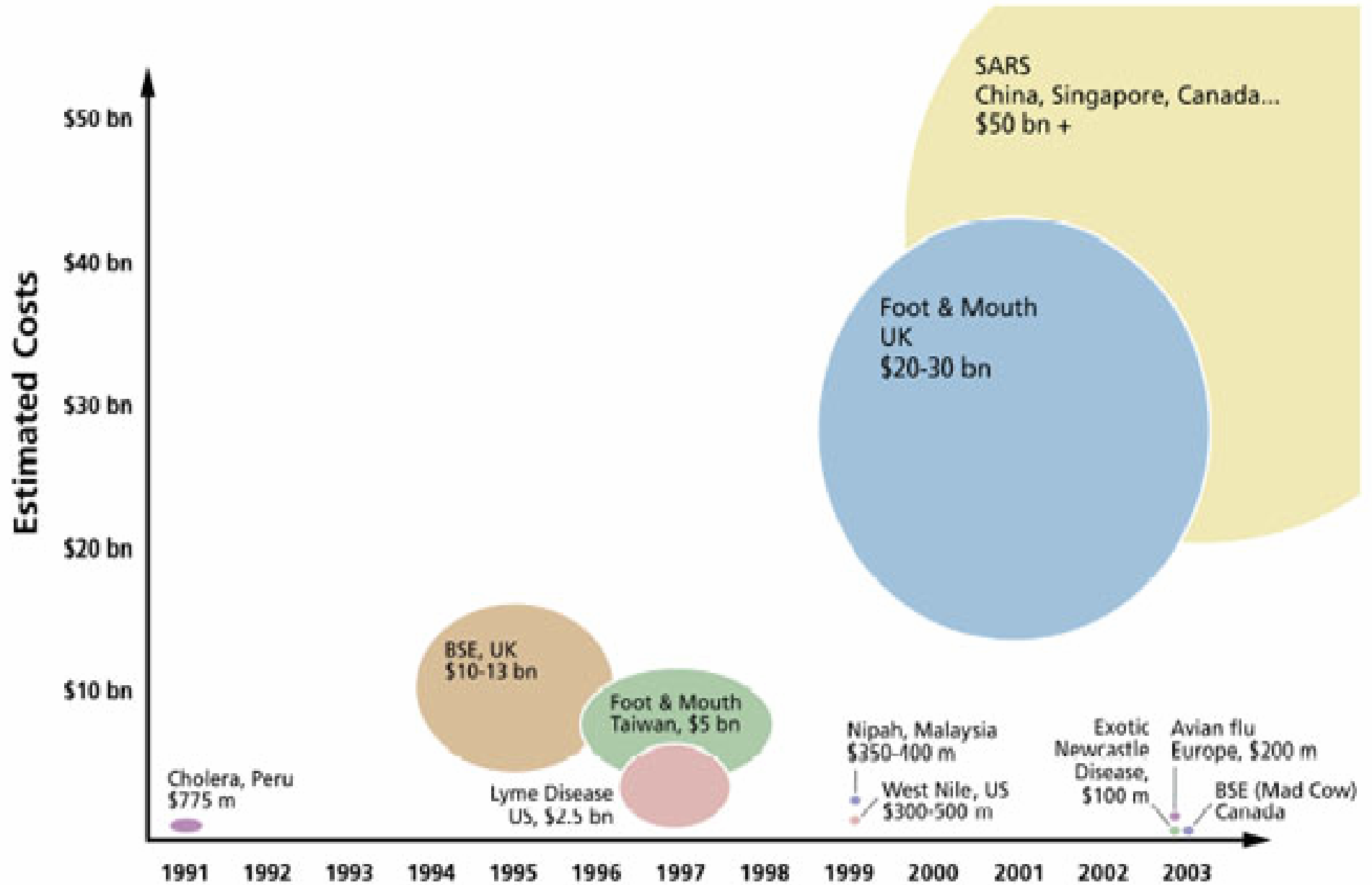
Weapon type

- Nuclear
- Radiologic
- Chemical
- Explosive
- **Biological**
- Psychological
- Cyber

Cost per death

- \$800 - \$10,000
- ?
- \$10 - \$600
- ~\$2,000
- **\$1 - \$10**
- ?
- ?

Figure 4: Economic Impacts of Selected Emerging Infectious Diseases



Figures are estimates and are presented as relative size. See Table 1 for more details.



9-11 and al Qaeda

A \$350,000 investment turned into
a \$100 billion return

What do bioterrorists need to get *started*?

- Knowledge
 - Microbiology
 - Specific know how
- Equipment
- Seed stock



Or put another way, you need

- An **effective terrorist group** or other type of perpetrator
- A **target** population or effective host
- **Availability** of a selected biologic agent
- An effective method of **dissemination**
- Proper **environmental conditions**



How will we know that we've been bioattacked?

- Suspicion or confirmation of a **sentinel** case
- **Arrival in numbers** esp. in the ICU, ER
- **Gradual recognition** by ER doc's, ID physicians, GP's
- Clinical **lab isolate**
- **Algorithm** or Public Health syndromic surveillance detection
- Opening a suspicious **letter**
- **Best** - Infiltration into the organization or intelligence
- **Worst** - After mass chaos has alerted us

And remember that of all biothreat agents, only *smallpox*, *pneumonic plague* and the *viral hemorrhagic fevers* are contagious from person-to-person.

But bioweapons can also have *disadvantages*

- They are untested
- They are extremely unpredictable
- Difficult to use & control, and messy to deal with
- Long lifespan
- If used outdoors, weather is unpredictable
- Socially unacceptable

Is the recent anthrax attack the
first time the US had a
DOMESTIC bioterror **ATTACK?**





In 1984 the Bhagwan religious cult put *Salmonella* in the salad bars of 10 restaurants to incapacitate voters in The Dalles, Oregon, to influence a local election. 715 people became sick.

Original Contributions

A Large Community Outbreak of Salmonellosis Caused by Intentional Contamination of Restaurant Salad Bars

Thomas L. Tenck, MD; Robert V. Tauxe, MD, MPH; Robert F. Wise, MD, MPH; John P. Livingston, MD; Robert Sokolow, Steven Marder, Kurt A. Mckinnis, Michael P. Skeels, PhD, MPH; John M. Horan, MD, MPH; Laurence R. Foster, MD, MPH

Context.—This large outbreak of foodborne disease highlights the challenge of investigating outbreaks caused by intentional contamination and demonstrates the vulnerability of self-service foods to intentional contamination.

Objective.—To investigate a large community outbreak of *Salmonella* Typhimurium infections.

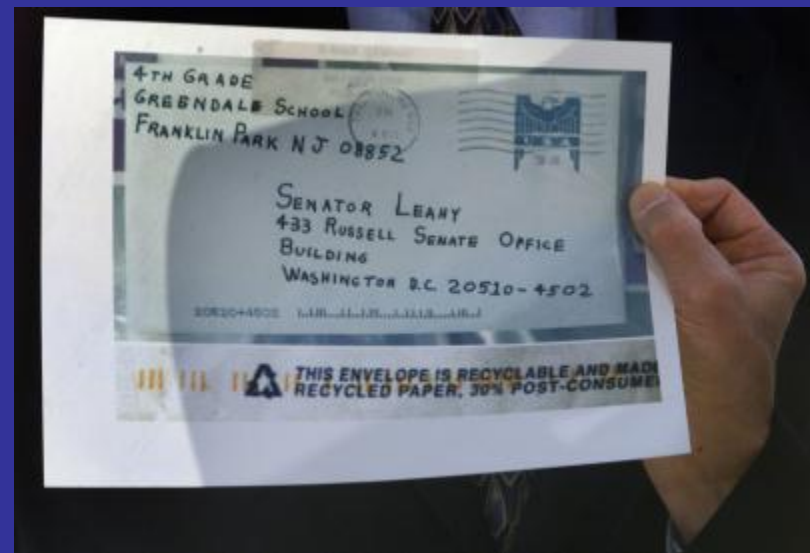
Design.—Epidemiologic investigation of patients with *Salmonella* gastroenteritis and possible exposures in The Dalles, Oregon. Cohort and case-control investigations were conducted among groups of restaurant patrons and employees to identify exposures associated with illness.

OUTBREAKS of foodborne infection are caused by foods that are intrinsically contaminated or that become contaminated during harvest, processing, or preparation. It is generally assumed that such contamination events occur inadvertently; intentional contamination with a biologic agent is rarely suspected or reported.^{1,2}

On September 17, 1984, the Wasco-

The 2001 anthrax outbreak: The facts

- 4+ letters in a few Eastern states
- 22 cases (11 inhalational, 11 skin)
- 5 deaths
- 5,100 exposed of which only 152 chose to be vaccinated



THEN...



NOW...



680 million pieces of mail are handled per day in the US

There was confusion about which antibiotics to use!

- CDC said to use cipro
- NIH said to use doxycycline
- The FDA said neither were licensed

- Few took them for 60 days anyway

There was abundant testing!

- DOD tested 30,200 specimens
- CDC tested 7,500 specimens
- PHL's tested 84,010 specimens

Thus there were >121,000 environmental specimens tested

AND THIS WAS IN ADDITION TO ALL THE CLINICAL SPECIMENS TESTED

The 2001 anthrax outbreak: The consequences

- Public health chaos with no data to base expert's advice on & many unanswered questions
- Labs quickly became overwhelmed
- Tens of thousands of courses of antibiotics prescribed
- Decontamination headaches
- Lots of money spent
- Great panic and anxiety
- Businesses changed
- New technology initiatives
- The government initiated a new era of preparedness at all levels

Thus, 22 anthrax cases caused:

- 10,000 people put on antibiotics
- 200,000 people directly affected
- 1 million people indirectly impacted
- Produced a \$6 billion budget

**Is it possible to make
an anthrax strain that
is resistant to all
antibiotics and
vaccines?**

Yes!

Bio Kaczynski

or

Bio bin Laden?

Who sent the anthrax letters?

- The Osama bin Laden networks
- Other Muslim or Arab terrorists
- Other pro-Muslim or pro-Arab terrorists
- Agents of an anti-US government being opportunistic
- Foreign terrorists who hate the US government but are being opportunistic, and are not directly related to pro-Muslim or pro-Arab terrorists
- The militant anti-abortion wing of the Christian Right (claiming credit for the hoax letters to Planned Parenthood clinics, but very unlikely in other cases involving real anthrax)
- Patriot & militia movement members or followers
- The Extreme Right (including Neofascists and Neonazis, and proponents of Third Position ethnonationalism)
- One crazy person or several crazy people
- A person or persons affiliated with a US weapons laboratory with a political agenda.
- A person or persons affiliated with a US weapons laboratory seeking monetary gain.
- More than one category can be involved. For instance a person at a weapons lab could have sold the processed powder to someone else with a political agenda.

The FBI's profiling and Don Foster's Vanity Fair article felt that it was a domestic terrorist.



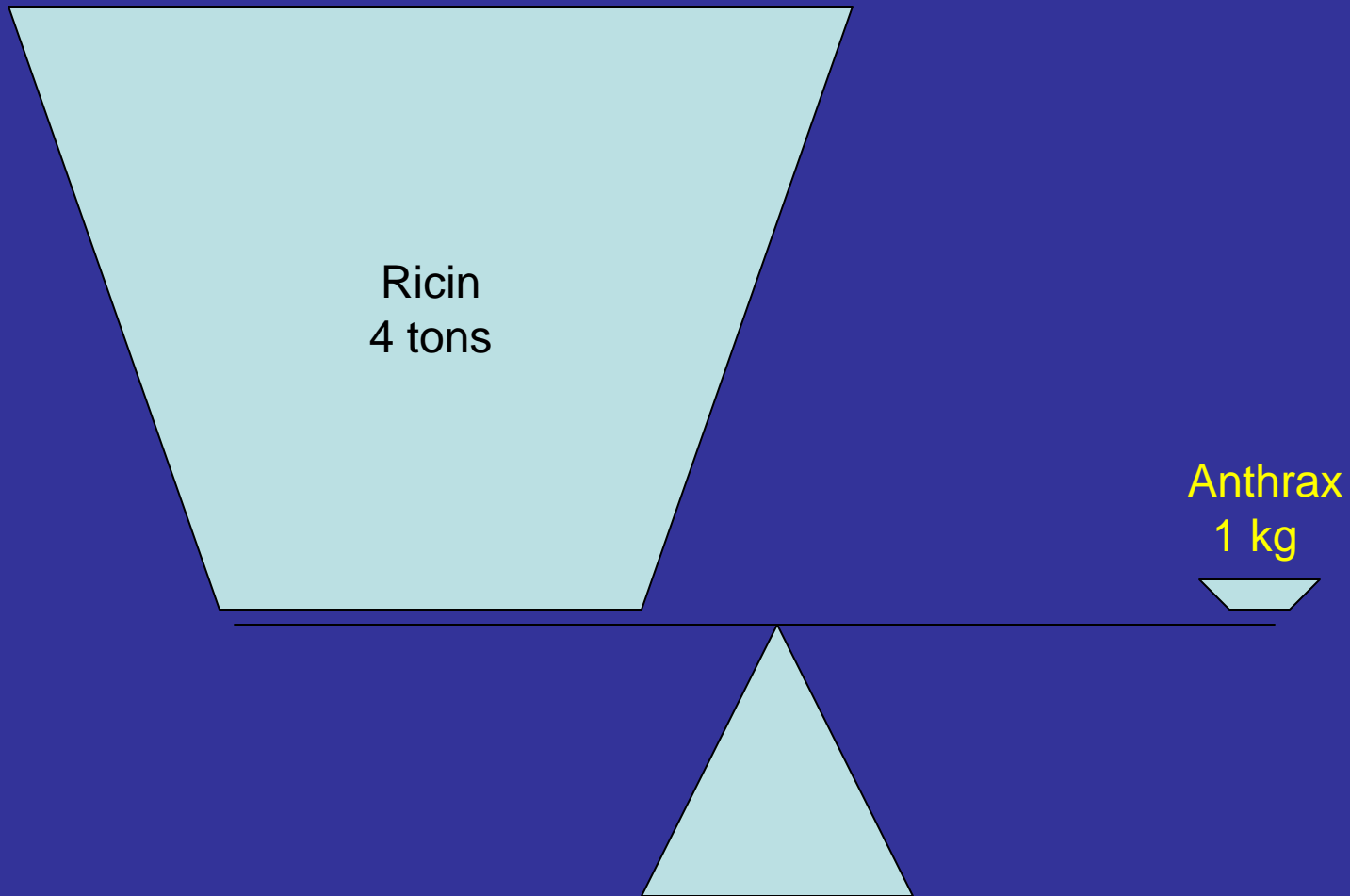
Steven Hatfield

Post-anthrax



- Since then there have been >20,000 "white powder" incidents
- The U.S. government has begun a program of stockpiling anthrax vaccine for 25 million people
- Genomic detectors have been placed in large postal facilities
- The cost of dealing with the anthrax letters has been hundreds of millions of dollars

Killing Power



Have there ever
been any
“anthrax accidents”?

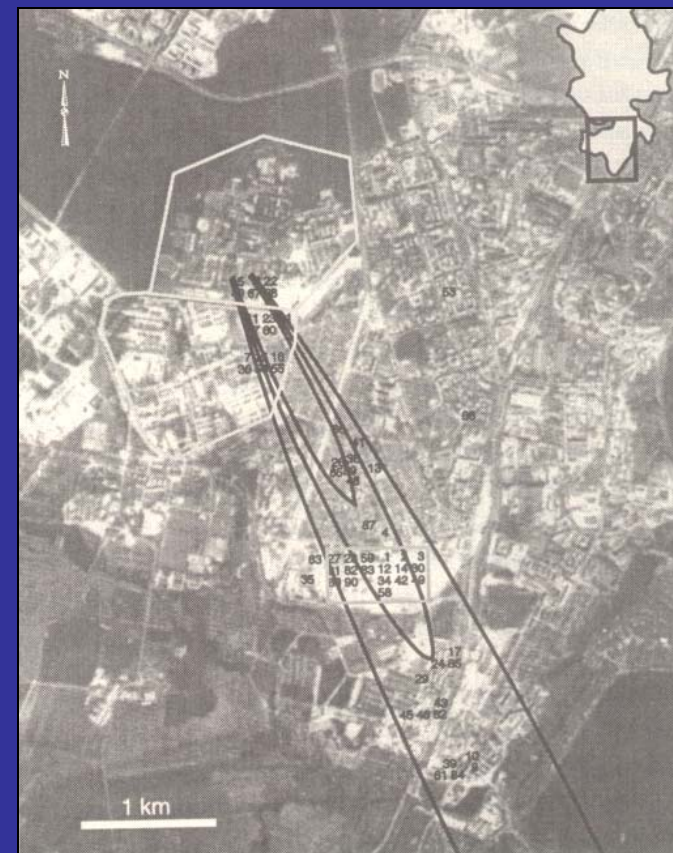
The Sverdlovsk Incident: A Biological experiment



- April-May 1979
 - 66 Anthrax fatalities
- 1988
 - Soviets present data:
 - 96 cases
 - 79 gastrointestinal
- May 1992
 - Yeltsin admits “military developments”

Sverdlovsk:

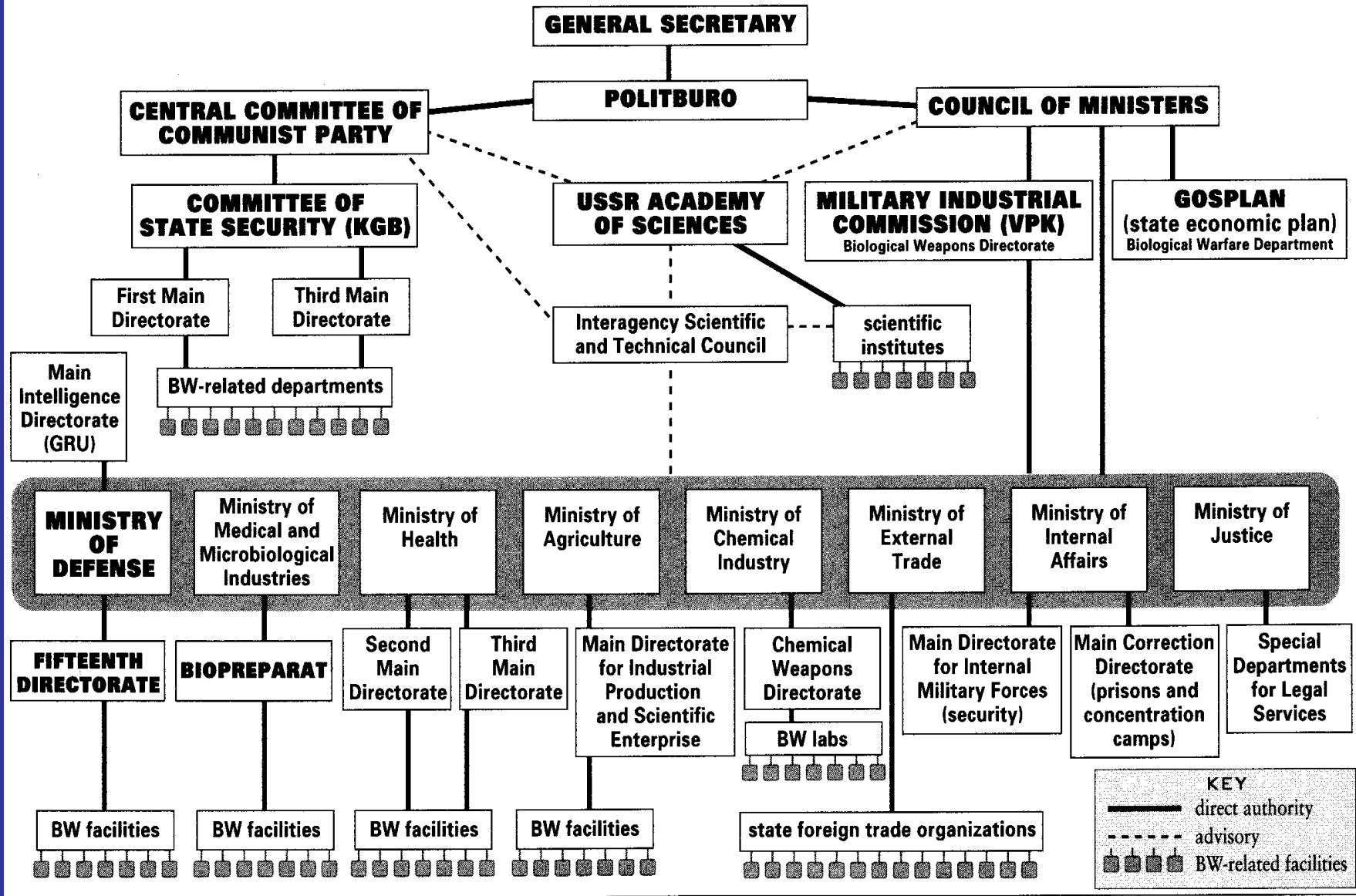
A case study of an anthrax accident



The Soviet Bio-weapons Program

- Continued *even after* signing 1972 BWC
- *Biopreparat* of the Soviet Union
 - Agency under Ministry of Defense
 - 32,000 - 60,000 scientists and technicians
 - 6 research labs, 5 production facilities
- Program inherited by Russia
 - In 1992 President Yeltsin promised to terminate the program but:
 - Still employs ~25,000 people
 - Defections to rogue states is a problem
- Is there still an existing program?

THE SOVIET BIOLOGICAL WARFARE SYSTEM (1990)



The Russians produced bioagents FOR OFFENSIVE USE BY THE TON!

<u>Agent</u>	<u>Quantity (metric tons)</u>
Anthrax	>1,000
Plague	>1,000
Smallpox	100
Glanders	>1,000
Tularemia	>1,000
Marburg	100

More on the Soviet Union

- The Soviet Union deployed warheads with smallpox on at least four ICBMs - the SS-11, SS-13, SS-17, and SS-18.
- These missiles were intended to kill off any American survivors in the aftermath of a nuclear attack.



Russian Bioweapon Problems

- The fact that we knew nothing about this program until Ken Alibek told us was a tremendous intelligence failure
- Stockpiles remain and are poorly guarded
- Tremendous financial incentive to sell the stocks, technology and people to terrorists
- Nunn-Lugar Bill is a good start

Is smallpox worth all the fuss?

Who should be vaccinated?

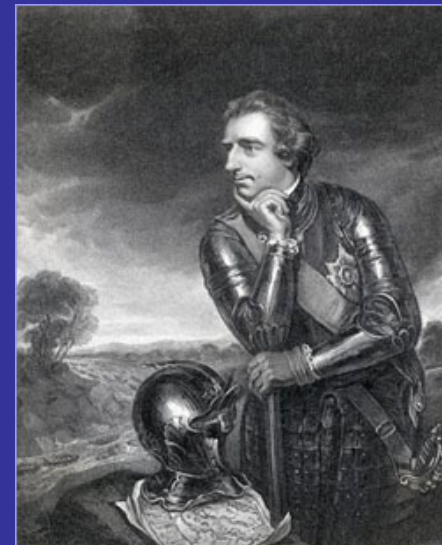
If it comes back, will millions die?





Early Events: Bioterror of 1763

- British officers gave blankets contaminated with smallpox to Native Americans during French & Indian War



During the 20th Century
100 million people
died from armed conflict &
300 million died
as a result of smallpox.

The NYC Outbreak in 1947

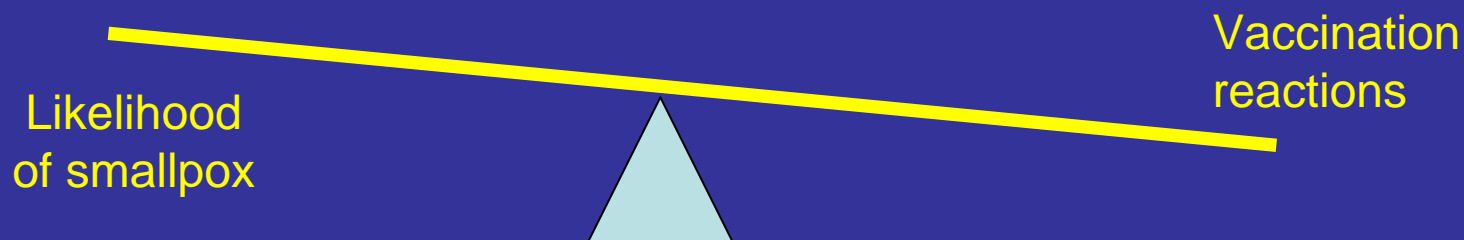


The US Smallpox Vaccination Plan

- Announced by President Bush 2/02
- Cost \$100 million
- Aimed to protect 500,000 military and 500,000 civilian healthcare personnel
- Of 38,000 healthcare workers vaccinated 29 had cardiac toxicity
- New study said prior immunity is longer than originally thought

The US government's choices

- Don't vaccinate anybody
- Vaccinate those at highest risk
- Vaccinate anyone desiring to be vaccinated
- Make vaccination compulsory



Plague helps us put
biowarfare into the proper
historical context?

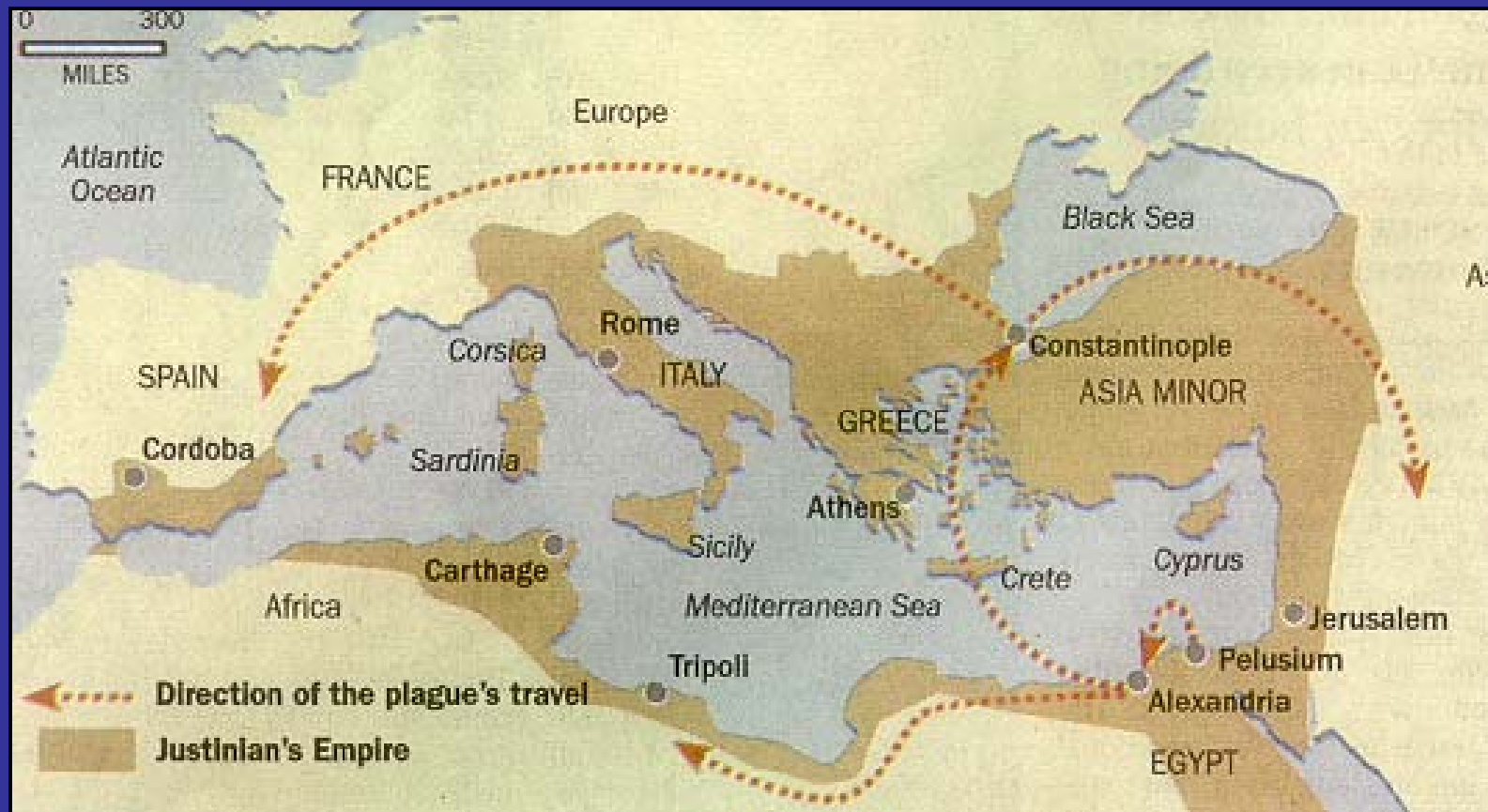


Plague through the Ages

- Justinian's Plague
 - 6th Century
 - killed ~100 million people (50% of Europe's population)
- The Black Death
 - 1347-1351 killed ~25 million (50% of the population)
- The Chinese pandemic of the 19th & 20th Centuries
 - The Los Angeles outbreak in 1924-1925
- Japanese used plague as a bioweapon
- Worldwide there are still ~2,000 cases per year



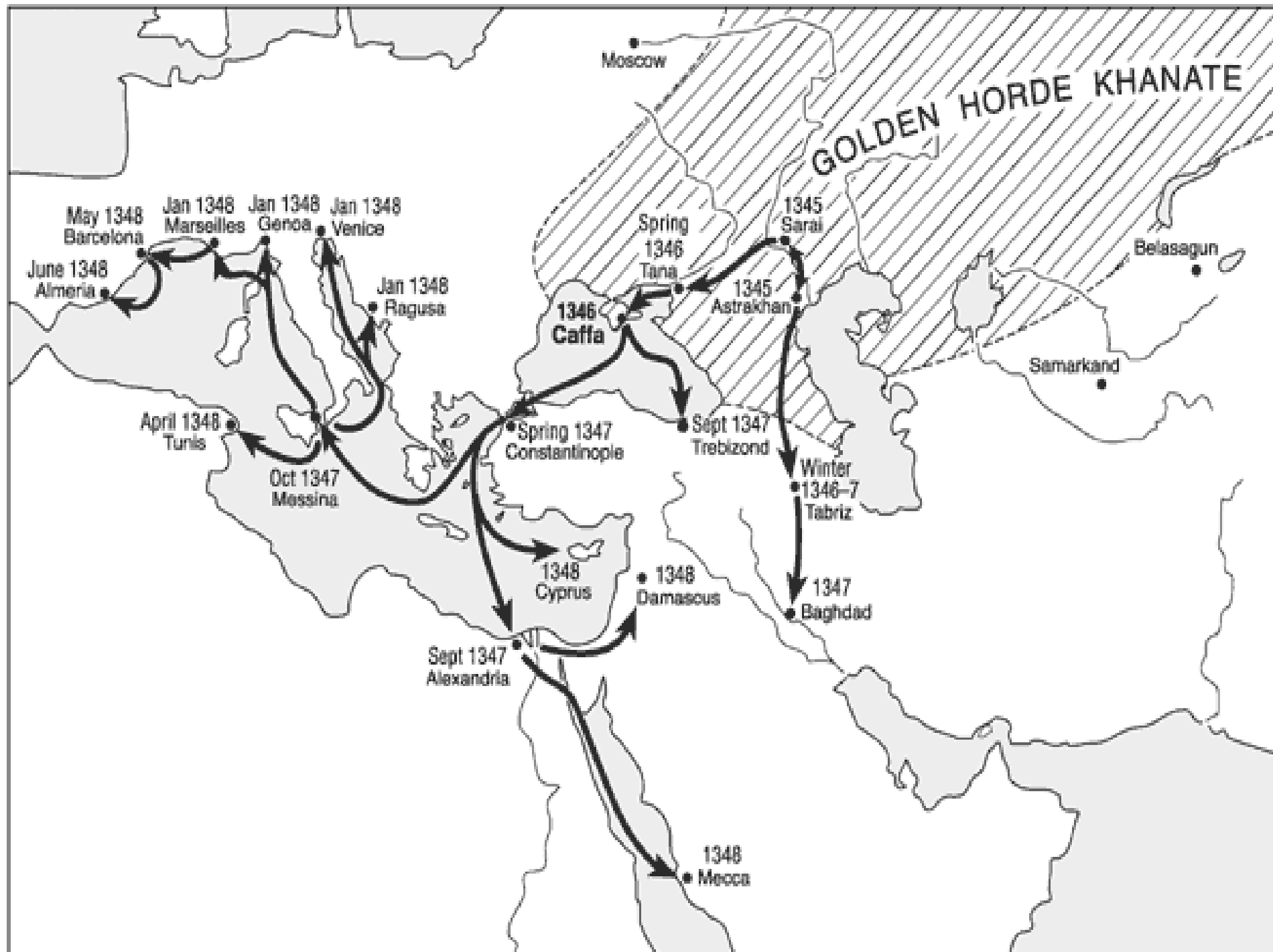
Justinian's "Plague"*



The Black Death

- In 1346, the second plague pandemic, also known as the *Black Death* or the *Great Pestilence*, erupted
- Within 5 years it ravaged the Middle East
- Killed more than 25 million people in Europe and 13 million people in China.





Plague As a Bioweapon

- In 1346 the Mongol/Tartar army hurled the corpses of plague victims over the walls of Caffa, a seaport on the Crimean coast (current Ukraine).
- This may have caused the European epidemic that resulted in >25 million deaths!
- In 1422 at the battle of Carolstein, bodies of plague-stricken soldiers plus 2,000 cartloads of excrement are hurled into the ranks of enemy troops.
- In 1710 Russian troops hurled the corpses of plague victims over the city walls of Reval during Russia's war with Sweden.
- In 1718 Russians used the same tactic against Sweden again



The Black Death capsized the medieval theocracy and gave the Renaissance a chance to shine.



Iraq's biological weapons (the 1990s)

- Iraq was found to have 19,000 liters of botulinum toxin, 2,200 liters of aflatoxin and 8,500 liters of anthrax.
- They acknowledged filling 25 missiles and 157 bombs with anthrax and botulism toxin.



Iraqi's Delivery Systems for Biological Weapons

SCUDS:

- 13 with Botulism Toxin
- 10 with Anthrax Spores
- 2 with Aflatoxin

Bombs:

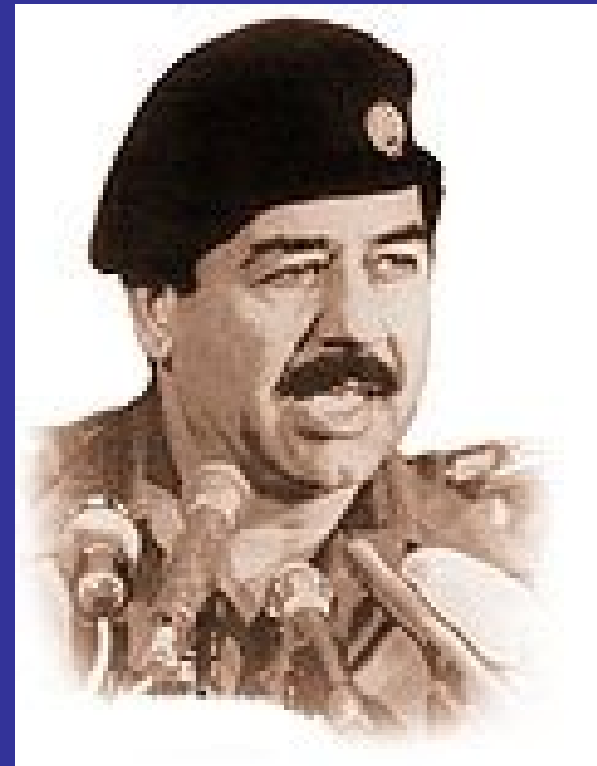
- 100 with Botulism Toxin
- 50 with Anthrax Spores
- 16 with Aflatoxin



Plus at least one remote control MiG-21 with a 500-gallon sprayer.

Why didn't Iraq use biological weapons in the Persian Gulf War?

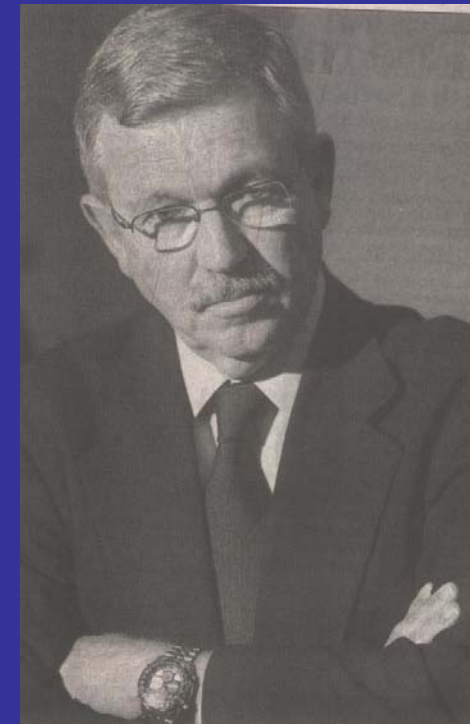
- The US made it clear that if used, Baghdad would be “returned to the Middle Ages”
- There was a fear that Israel would retaliate with nuclear weapons
- The chain of command was broken so Saddam couldn't give the order
- They would contaminate their own people



David Kay: Why no (large stockpiles of) weapons?

- US bombing in 1991
- 7 years of UN sanctions
- Iraq's own arms destruction programs in the early 1990s

BUT HE ALSO SAID



Saddam " kept the scientists
and kept the capability" to
restart his program and thus
remained a threat.

Saddam was "pursuing a course of constructive ambiguity" - that is bluffing - about WMD after the mid-1990s in an effort to frighten his rivals at home and in Iran, boost his prestige in the Arab world, and deter a Western attack.



In other words, is absence of evidence of WMD the same as evidence of absence?

- Did Iraq not have any bio/chem weapons in 2003?
- Did they hide them somewhere domestically?
- Did they give them to their friends or **neighbors** for safe keeping?
- **Did they have an infrastructure in place to quickly re-construct them in case of need?**
- **Saddam was constantly fed misinformation.**
- Did they want to become the future surrogate warehouse for terrorist organizations?





U.S. Offensive Biological Weapons Program

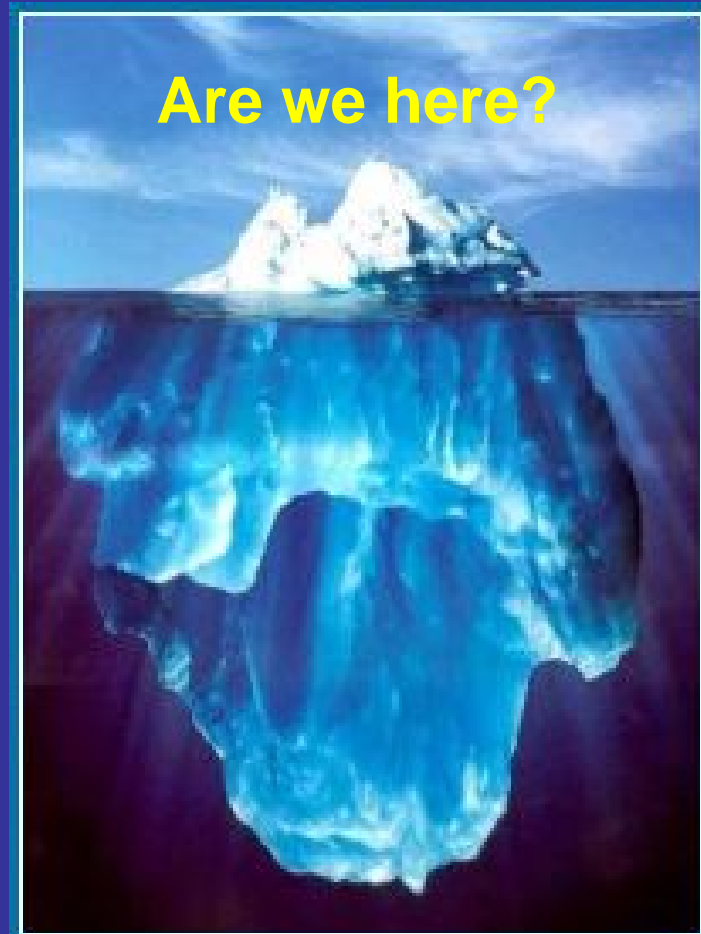
- August 1945
 - Program was within months of bringing an anthrax plant online
- 1950s
 - Program expanded during Korean War
- 1954–1973
 - Trials with human volunteers
- 1949–1968
 - Tests with simulant organisms in U.S. cities
- 1969
 - US *terminated* offensive biological weapons program
- 1970–1972
 - Stockpiles of agents destroyed

The NYC Subway Dispersion Test, 1966

- Used the simulant B.glabigii
- Threw 3 light bulbs on the tracks → very quickly contaminated the entire tunnel
- Nobody seemed concerned
- The average commute of the 1 million people who used it daily was 8 minutes
- <1 kg used → 500,000 cases with 50% mortality

Moving on to US preparations

- How prepared have we been in the past?
- How prepared are we now?
- Ideally, how prepared can we possibly be?
 - Internationally
 - National level (the GWOT)
 - State level
 - County level
 - Local/city level



Chance prepares the
prepared mind.



Louis Pasteur

What is the US goal?

- Protect lives
- Protect critical infrastructure
- Economic welfare
- Preservation of quality of life

- Biodefense
- Bioforensics
- Agricultural biosecurity



Biological Terrorism:

What's important to the nation?

- Awareness of the risk
 - The real threat...not just the popular threat
- Education
 - What we don't know can hurt us
- Readiness for the unexpected
 - Diagnostics, drugs, vaccines
- A strong technological base
 - To keep up with and develop new technology



...HONEY, THE ATTORNEY GENERAL WANTS YOU TO MOVE TO A HIGHER STATE OF ALERTNESS...

UNITED STATES WE STAND

CIPRO ONE CROSS

LIVE

Protecting Our Citizens

Intelligence

- Agent
- Delivery system
- Organization
- Time

Medical Countermeasures

- Vaccines
- Diagnostics
- Therapeutics

Education

Interagency Collaboration

Physical Countermeasures

- Detection
- Physical protection
- Decontamination

Who should be involved?

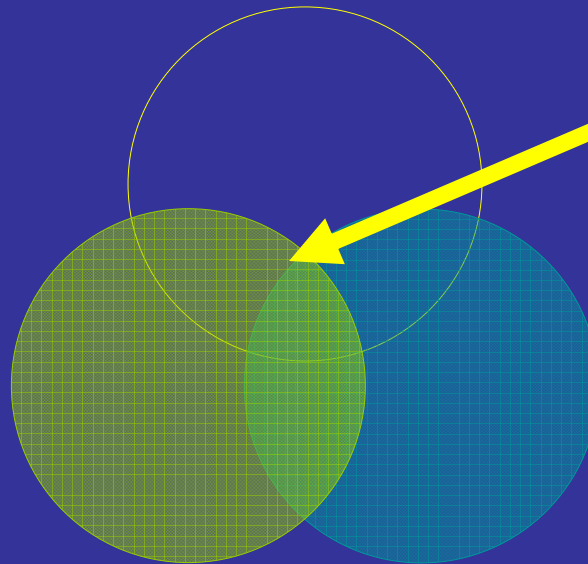


Law enforcement & intelligence

**Patients,
exposed,
exposed/not
infected &
the medical
community**

**Government
Public Health
EMS
Homeland Security
The military**

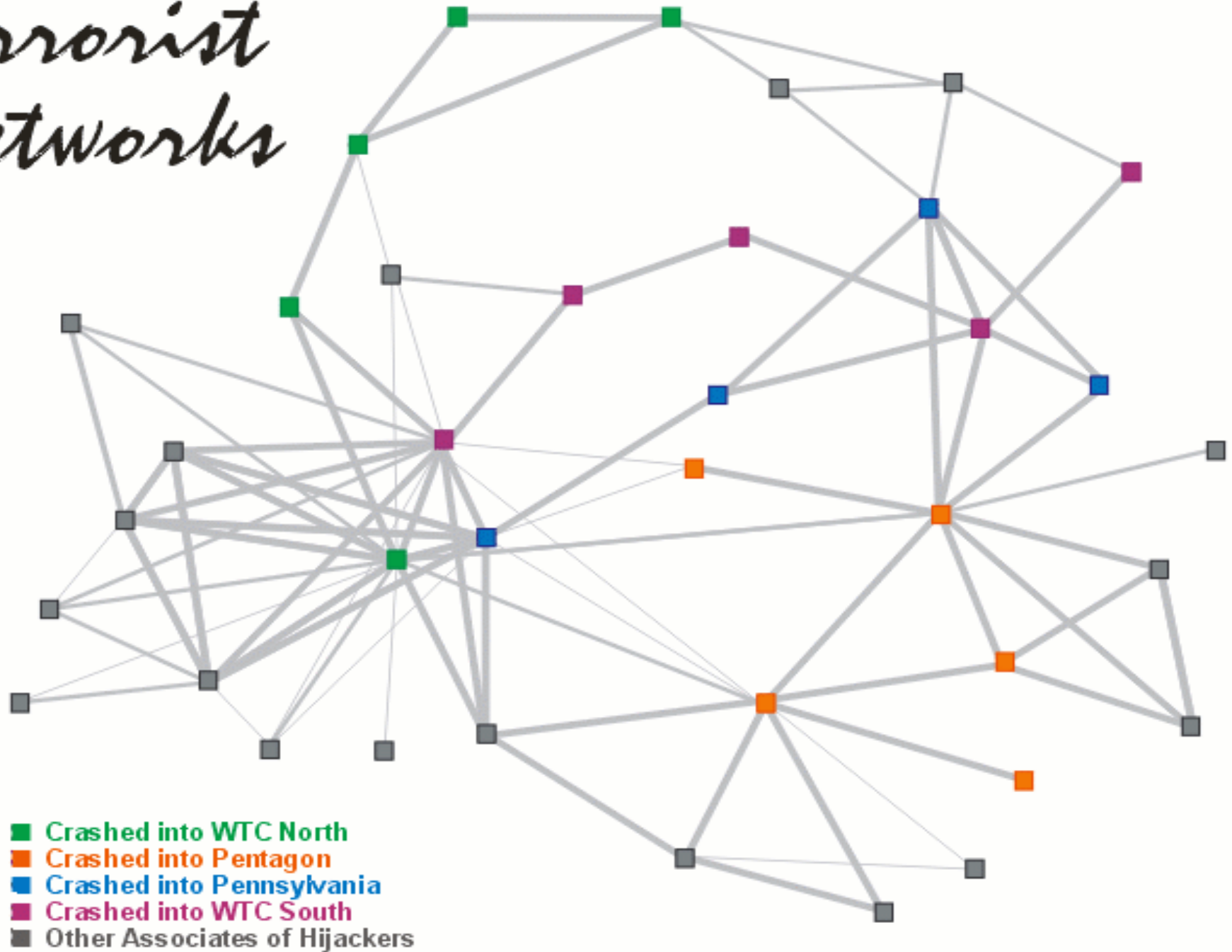
**Private Business
Universities
Think tanks
The media**



Agencies Responding to a Bioterror Attack

- Local
 - Public Health
 - Police, Fire, EMS
- State
 - Public Health
 - Disaster Management
 - National Guard
- Federal
 - DHS, CDC
 - Dept of Justice, FBI
 - Homeland Security
 - Dept of Defense
- International
 - Other governments
 - NATO
 - Dept of Defense
 - UN
 - Interpol

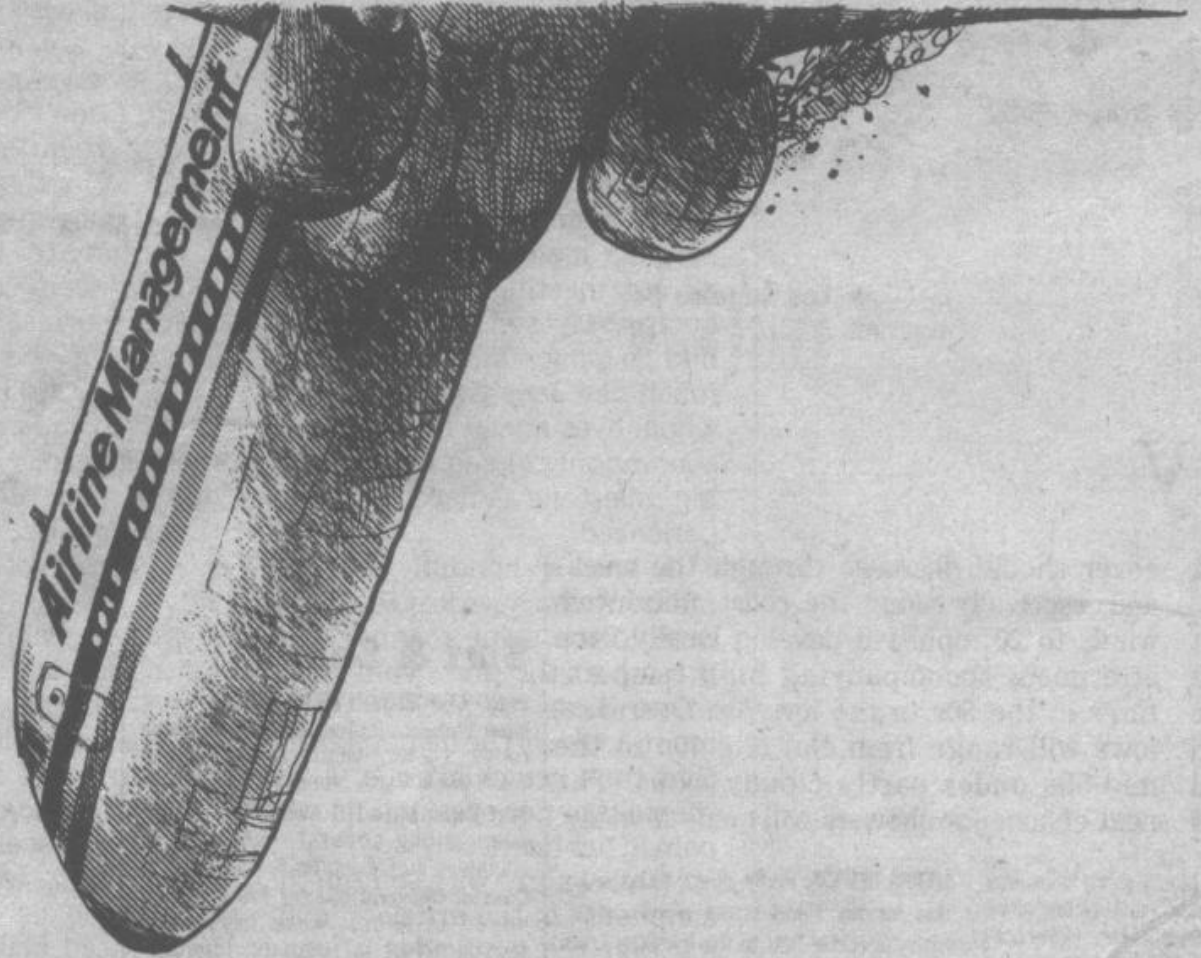
Terrorist Networks



MICHAEL RAMIREZ

RAMIREZ LOS ANGELES TIMES

IT'S BECAUSE OF THE
WEAK ECONOMY OR, OR,
9/11... YEAH, TERRORISM...
OR BECAUSE WE DONT HAVE
ENOUGH EXECUTIVE PERKS...
OR NO, NO... SARS!!



What can we learn from SARS?

- It's new and contagious
- It required quarantine and infection control and thus local law enforcement & public health had to work together
- Int'l cooperation & coordination was desperately needed
- It caused tremendous fear and panic
- Dealing with the media better
- The financial impact was significant
 - Rocked Asian markets
 - Ruined the tourist trade of an entire region
 - Nearly bankrupted airlines

How do we deal with large numbers of casualties?



What can we learn from Aum Shinrikyo?

- Purchased a 48,000 acre farm in Australia to test biological agents on livestock
- Sent members to Africa for Ebola samples
- Built two biologic research centers
- Had \$300 million of which about \$80 million was dedicated to bioterror
- *Previously had 8 unsuccessful anthrax attacks, but were not prosecuted for religious reasons*
- Only 1 attempt at using colorless and odorless sarin



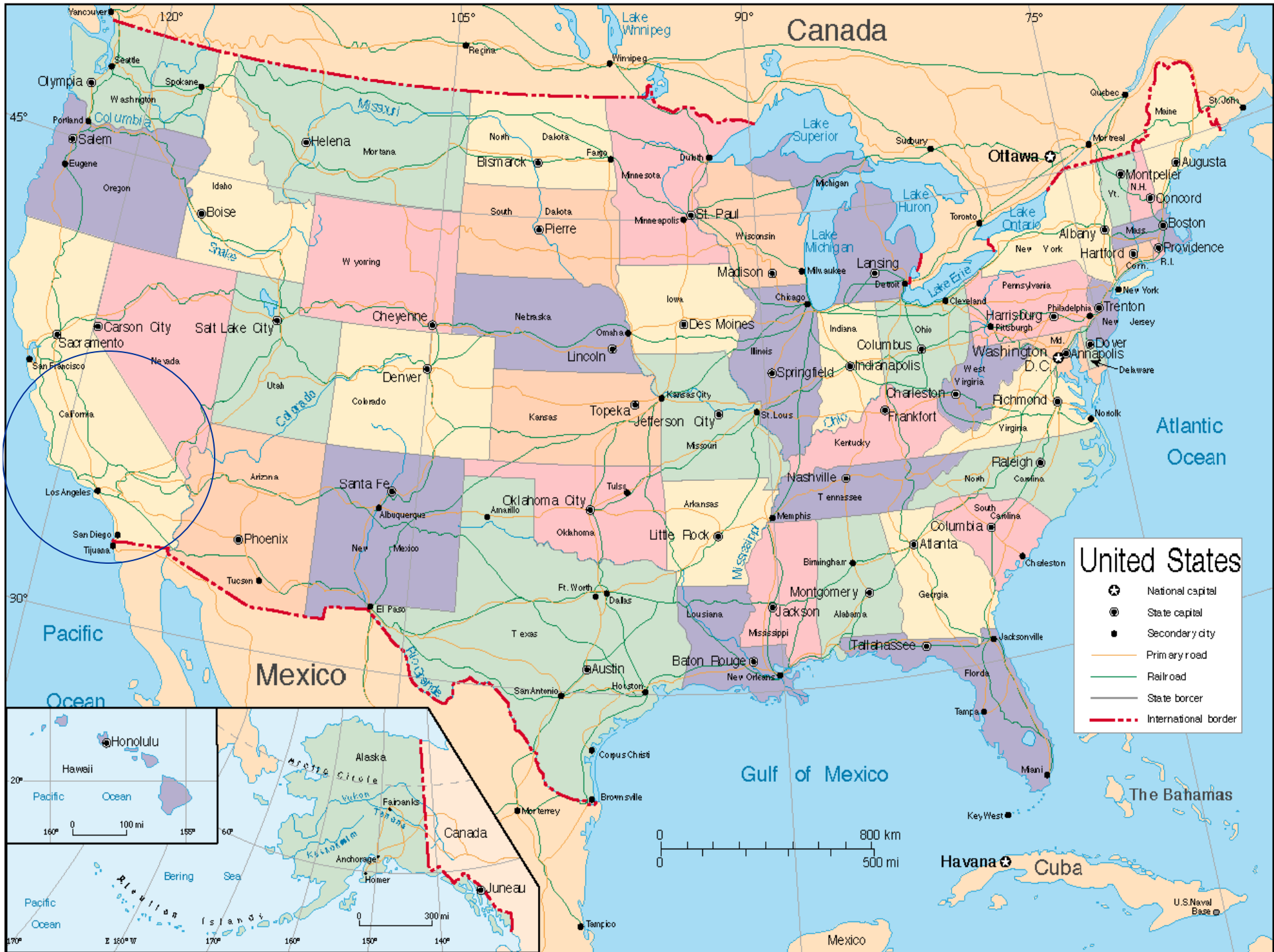
The 1995 Tokyo Sarin Gas Attack in the Tokyo Subway

- Three simultaneous attacks timed to coincide with rush hour when trains were packed with commuters
- Followed the Matsumoto attack the previous year that killed 7 people
- Much like what happened in the Madrid subway attack



The Immediate Consequences

- >5,500 injuries and 11 deaths
- ~600 victims were transported by ambulance
- 641 victims were treated at one hospital alone
- 260 Tokyo hospitals were affected
- Victims even climbed through windows to get into hospitals
- 23 hospital employees were contaminated by patients
- ER's became overcrowded causing diversion as far as 500 miles away



Sarin Confirmed in Bomb, Officials Say

From Associated Press

WASHINGTON — Comprehensive testing has confirmed the presence of sarin, a nerve gas that Saddam Hussein produced in the 1980s, in the remains of a roadside bomb discovered this month in Baghdad, two officials said Tuesday.

The determination, made by a U.S. laboratory that the officials would not identify, verified that the bomb was made from an artillery shell designed to disperse the deadly nerve agent on the battlefield, the two said, speaking anonymously.

Finding the shell's origin is a priority, a defense official familiar with the finding said.

Hussein's alleged stockpile of illicit weapons was the Bush administration's chief stated reason for invading Iraq, but U.S. weapons hunters have been unable to find those stockpiles.

Some analysts worry that the

155-millimeter artillery shell, rigged as a bomb that was found May 15, may be part of a larger cache of chemical weapons that insurgents can use. But no more have turned up, and several military officials have said the shell may have predated the 1991 Persian Gulf War.

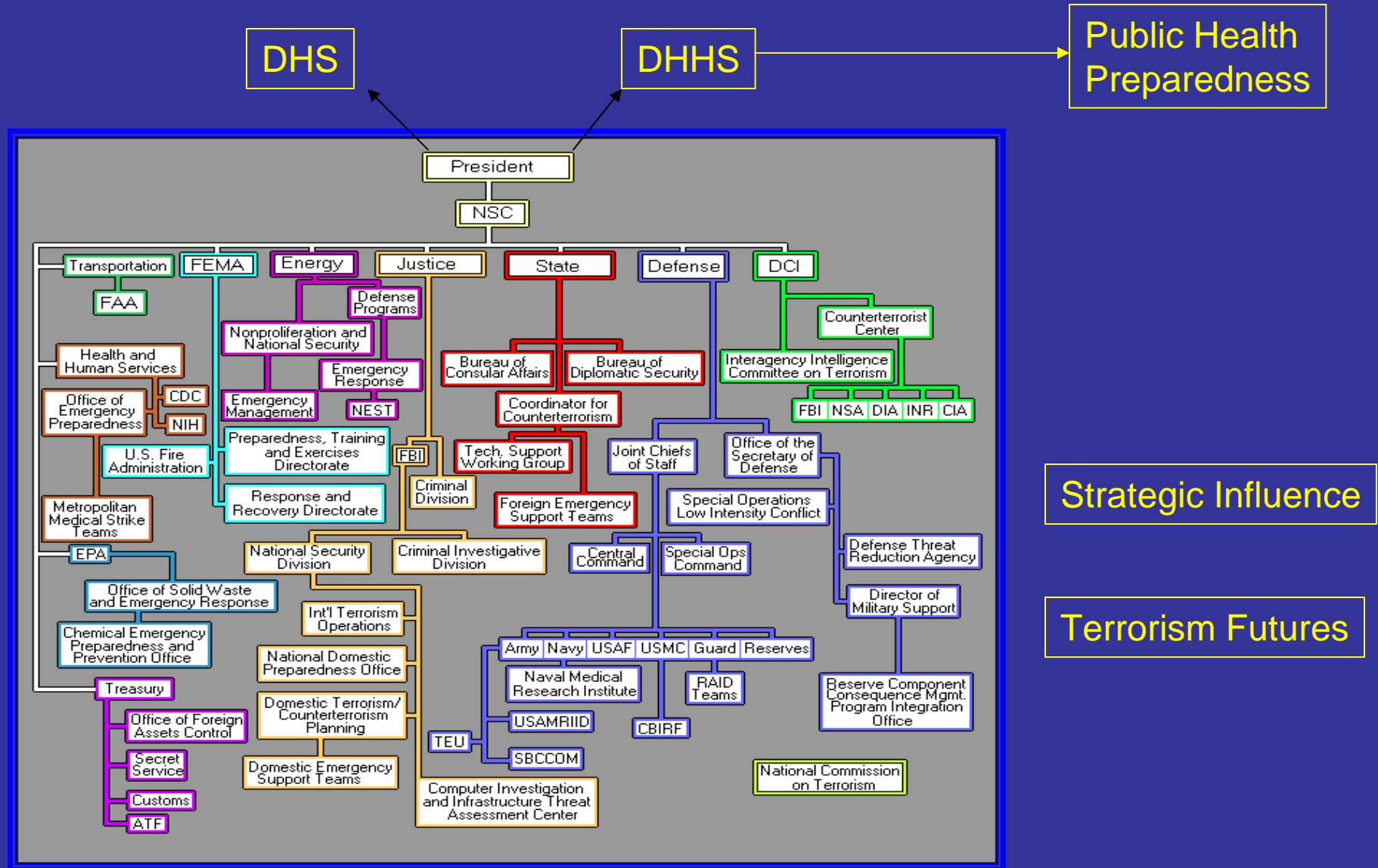
United Nations records indicate that sarin produced during that period degraded quickly and should no longer be lethal.

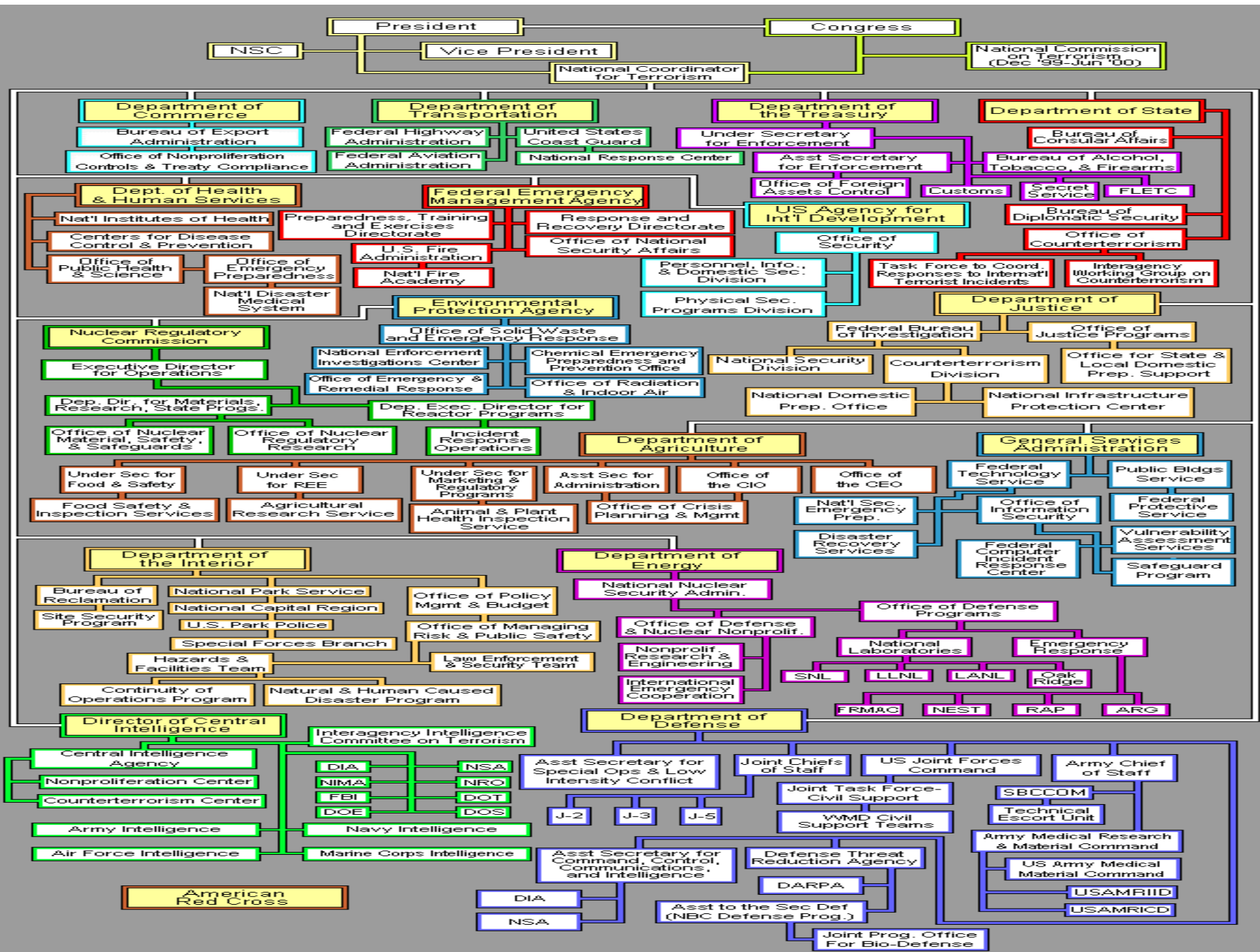
It is not known whether the bombers knew the shell contained a chemical weapon.

No one was injured in the initial detonation, but two American soldiers who removed the round showed symptoms of low-level nerve agent exposure, officials said last week.

The explosion released only a trace amount of sarin, U.S. officials said. The shell was a binary type, designed to mix two relatively safe chemicals when fired.

US Federal Response Framework





Project Biowatch:

Be careful what you wish for

- An aerosol warning system for early detection of biological attack
- 6 pathogens (smallpox, tularemia, plague, anthrax, glanders, and brucella)
- 36 cities with 50 sensors/city
- 7 tularemia hits in Houston took 2 months to figure out (consequence management issues like tularemia growing inside *acanthameba*)

Global Outbreak and Alert Response Network (GOARN)



combating the
international
spread of outbreaks

Global Outbreak and Alert Response Network (GOARN)

- major pillar of global health security aimed at the detection, verification and containment of epidemics
- systematically addresses the threat of natural and intentional epidemics through integrated strategies for combating known and unknown risks & coordinates a rapid specialized response
- responds to the unexpected (e.g. epidemic intelligence)
- assesses humanitarian impact
- improves both global and national preparedness.

Ultimately we need to:

- Strengthen the infrastructures
- Have a plan that includes discordant elements
- Use stockpiles wisely
- Increase educational programs, including PSYOPS
- Emphasize dual use
- Have a global networked approach to biosecurity
- Have the participation of the scientific community & adequate R&D funding

Politics & Science Don't Mix Well

- Restricting access to 20th Century pathogens is a losing game
- The insider threat is insignificant compared to opportunities in the open literature
- Controls that thwart legitimate science are self-defeating
- Nuclear weapons security is not a useful model for bioweapons
- Int'l agreement don't work well here

Readiness & Dual Use

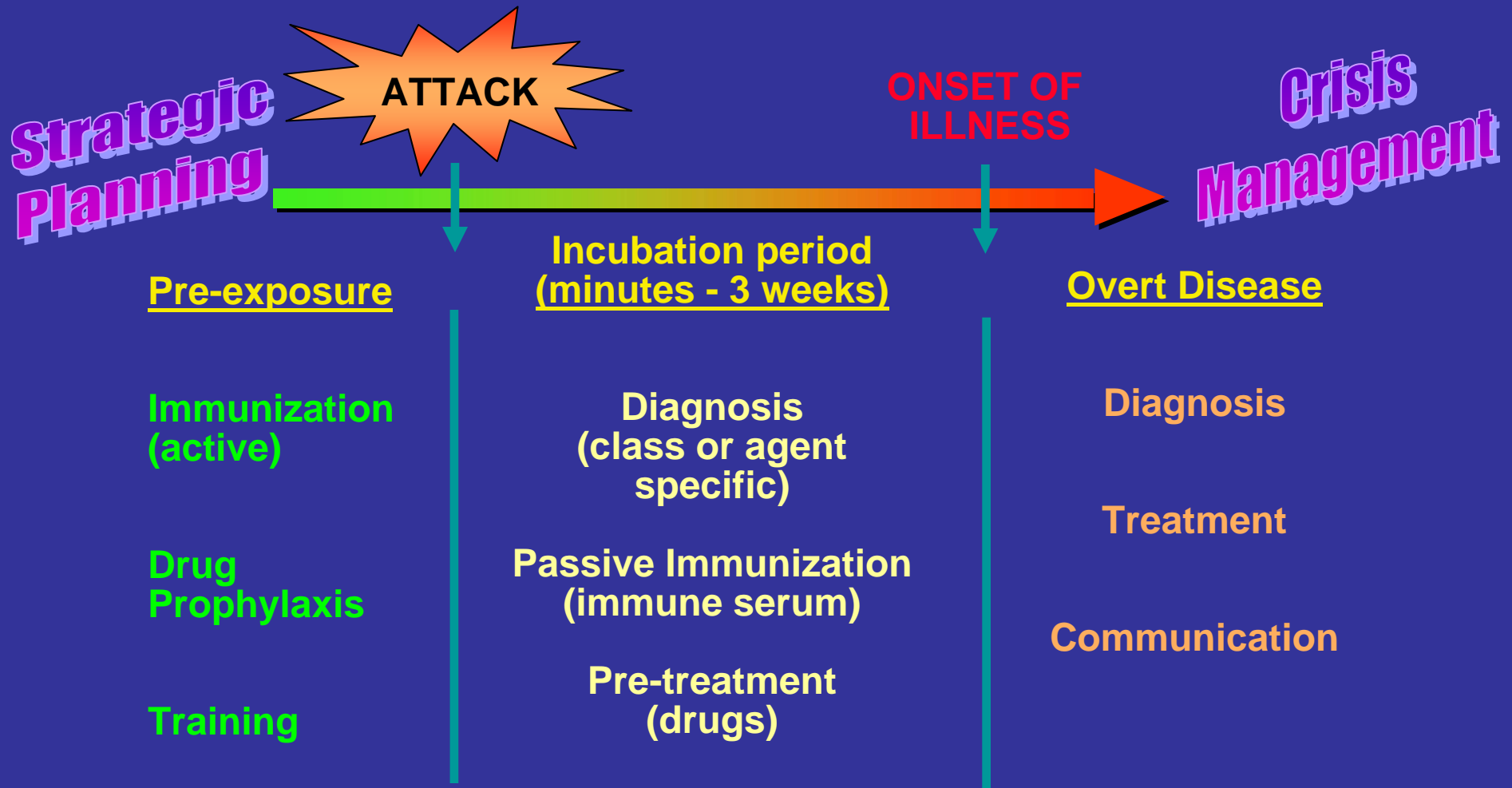
- Programs countering bioterrorism have a positive ripple effect
 - Enhancement of all medical & veterinary medical diagnostic laboratories
 - Better posture of the nation to address new & emerging diseases
 - Benefits extend to food & water safety
 - Environmental health
- But can also hide nefarious activities



Planning to Counter a Biological Attack: The Phases

- **Pre-Release**
- **Release**
- **Symptom Occurrence**
- **Illness Occurrence**
- **Epidemic**

RESPONSE TIMELINES



**Strategic
Planning**



ATTACK

**ONSET OF
ILLNESS**

**Confirmation
of a bioattack**

**Crisis
Management**



Pre-exposure

Incubation period
(minutes - 3 weeks)

Overt Disease

Immunization
(active)

Diagnosis
(class or agent
specific)

Diagnosis

Drug
Prophylaxis

Passive Immunization
(immune serum)

Treatment

Training

Pre-treatment
(drugs)

Communication

Back home, there is the new US Government Bioterror Directive *with 59 tasks*

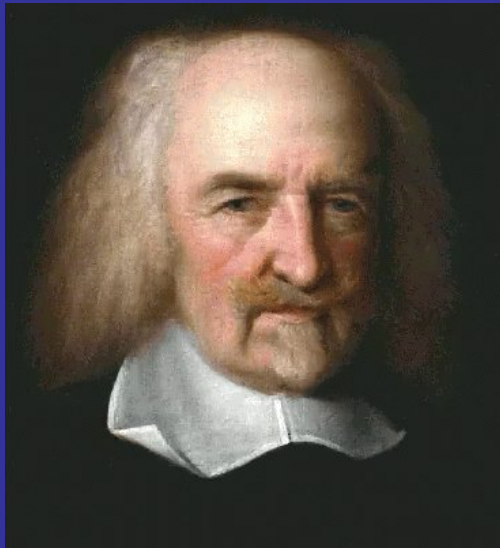
- Homeland Security - erecting air-sniffing sensors in dozens of cities to detect attacks
- HHS - develop vaccines and immunizes health workers.
- The Pentagon - training National Guard units for civil emergencies and coordinating military health research.
- Environmental Protection Agency - develop detailed plans for decontaminating cities after a strike.
- The intelligence community - carry out studies examining the types of genetically engineered "bugs" terrorists could be working on to mount an attack.

Experience is a wonderful thing:

It enables you to recognize a
mistake when you make it
again.

THE PATRIOT ACT

"What people want most from the state is protection, not freedom."



Leviathan (1651)

Thomas Hobbes

Why hasn't al Qaeda attacked us yet with WMDs?

- They're very busy in Iraq and Afghanistan
- They have been weakened, don't have the infrastructure in place in the US yet, and are still in the planning phase
- Retaliation may be more than they are currently prepared for
- They still feel more comfortable with conventional incendiary devices
- They are waiting for the right "political moment"

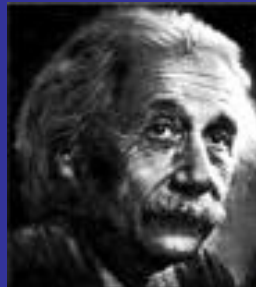
Remember

- Al Qaeda's interest in biological and chemical arms is well documented
- The group's ability to produce such weapons is believed to have been crippled by the loss of its sanctuary in Afghanistan
- Invading U.S. forces in 2001 discovered and destroyed two production centers that were preparing to manufacture cyanide, botulinum and salmonella toxins, and possibly anthrax
- Did they send the anthrax letters?

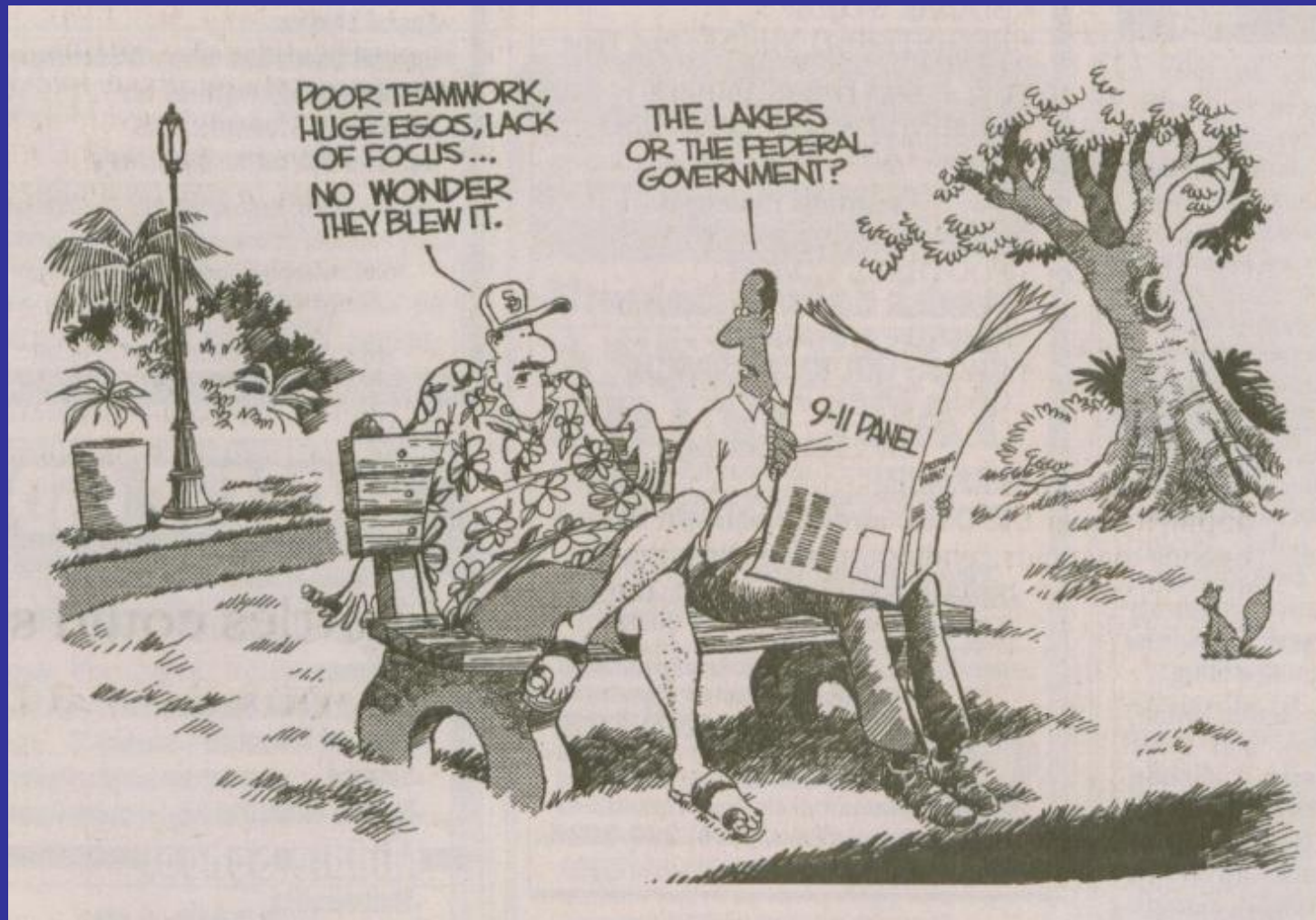


“The world is a dangerous place to live, not because of the people that are evil, but because of the people that don’t do anything about it.”

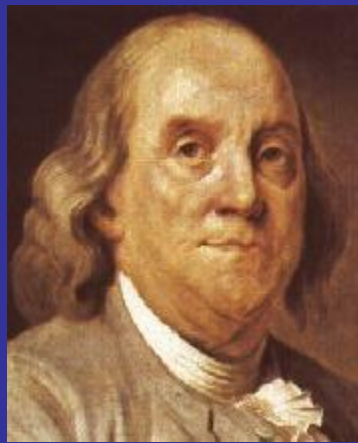
Albert Einstein



The 9/11 Panel: The facts are in; let the politics begin



"We must all hang together or assuredly, we shall all hang separately."



Ben Franklin

Common Misconceptions About Biological Agents

- Rarely used in the past so they won't be in the future
- Morally repugnant to use them, so they won't be used
- Production and dispersal are too technically difficult
- Potential casualties are unthinkable
(So don't think about it)

Bioterror: a Strategic Threat

- Massively lethal, proven to work
- Richard Danzig's "Reload" potential
- Knowledge widely dispersed
- Materials accessible and cheap
- Dual use hard to track, easily hidden
- Attribution difficult, little to hold at risk
- Epidemic response systems vulnerable

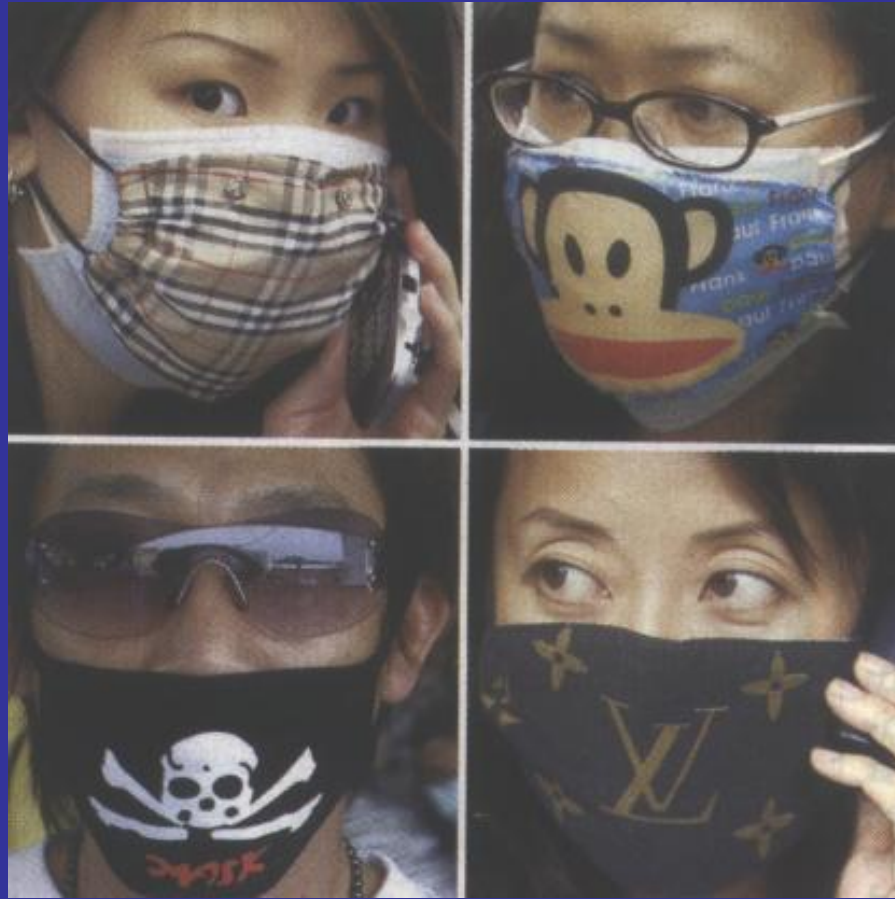
Questions Remain

- What is the actual threat?
- Is the current response appropriate to the threat?
- How much money should we spend & who should decide how we spend it?
- Do we need a generic federal or state plan, or a local plan specific for each community or both?
- Is an “all-hazards” plan better than an “agent-specific” plan or do we need both?
- How do we get public health, law enforcement, first responders, the medical community and intelligence to talk to and work with each other?
- How does the global war on terrorism fit in with the local war and the war against many other health issues?

You have to be lucky all the time. We only have to be lucky once.

The IRA





~ The End ~