"…one can think of the middle of the twentieth century as the end of one of the most important social revolutions in history, the virtual elimination of the infectious disease as a significant factor in social life."

Burnet, 1962

CDC
July 30, 1999 / Vol. 48 / No. 29

MMWR™
MORBIDITY AND MORTALITY
WEEKLY REPORT

621 Control of Infectious Diseases
629 Meningococcal Disease — New England, 1993–1998
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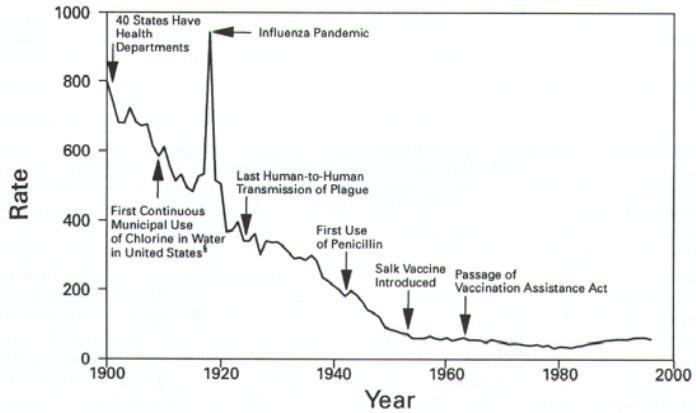
637 Notices to Readers

Achievements in Public Health, 1900–1999

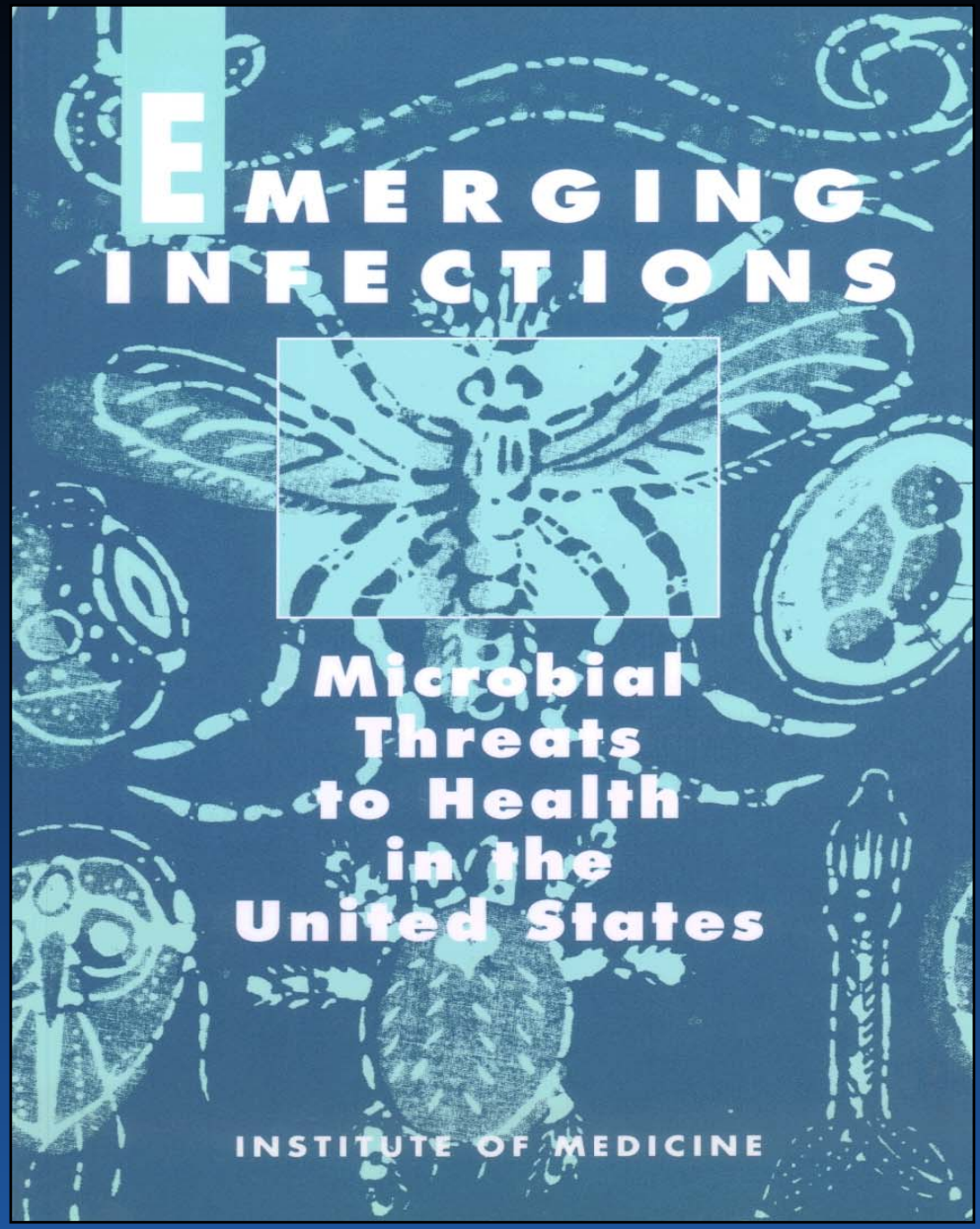
Control of Infectious Diseases

Deaths from infectious diseases have declined markedly in the United States during the 20th century (Figure 1). This decline contributed to a sharp drop in infant and child mortality (*1,2*) and to the 29.2-year increase in life expectancy (*2*). In 1900, 30.4% of all deaths occurred among children aged <5 years; in 1997, that percentage was only 1.4%. In 1900, the three leading causes of death were pneumonia, tuberculosis

FIGURE 1. Crude death rate* for infectious diseases — United States, 1900–1996†



*Per 100,000 population per year.
†Adapted from Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. JAMA 1999:281;61–6.
§American Water Works Association. Water chlorination principles and practices: AWWA manual M20. Denver, Colorado: American Water Works Association, 1973.


EMERGING INFECTIONS
Microbial Threats to Health in the United States
INSTITUTE OF MEDICINE

IOM Definition of Emerging Infections

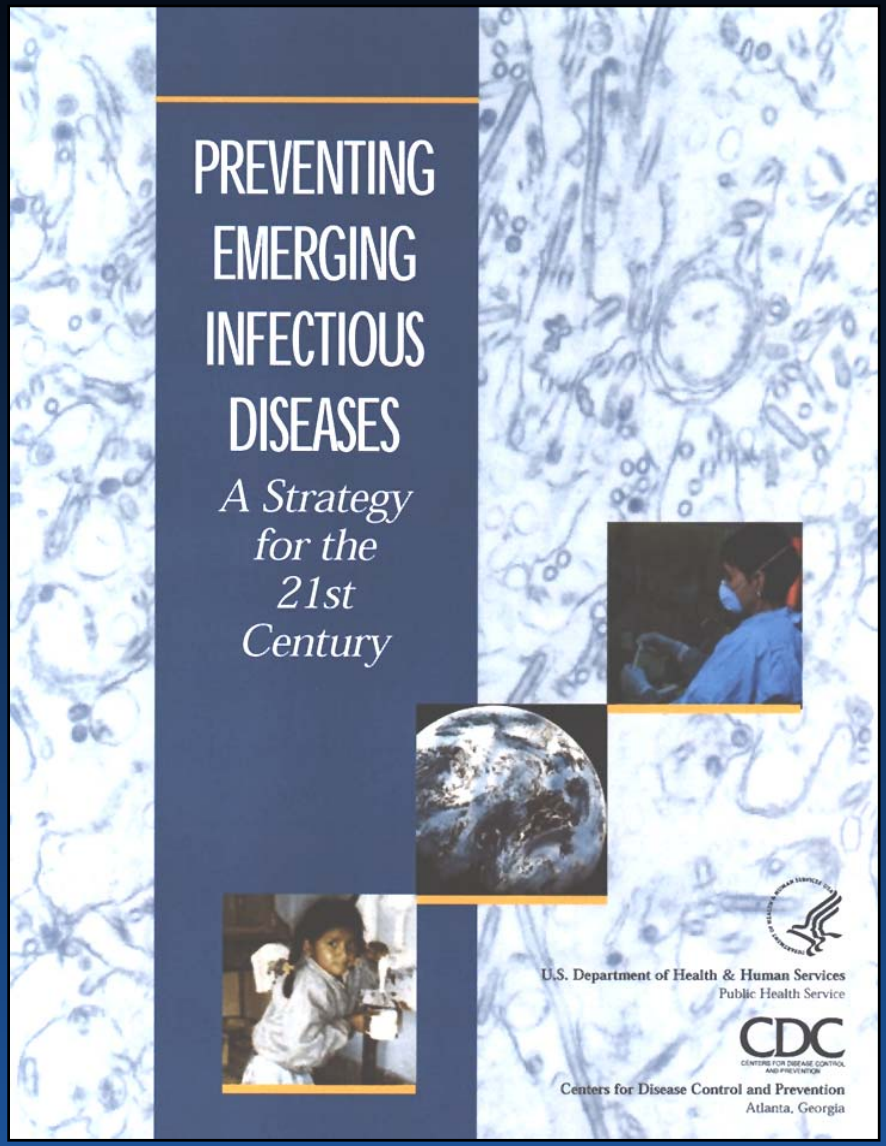
New, reemerging or drug-resistant infections whose incidence in humans has increased within the past two decades or whose incidence threatens to increase in the near future.

Institute of Medicine Report, 1992

Major Factors Contributing to the Emergence of Infectious Diseases

1. Human demographics and behavior
2. Technology and industry
3. Economic development and land use
4. International travel and commerce
5. Microbial adaptation and change
6. Breakdown of public health measures

Institute of Medicine Report, 1992



Goal I: Surveillance and Response

Goal II: Applied Research

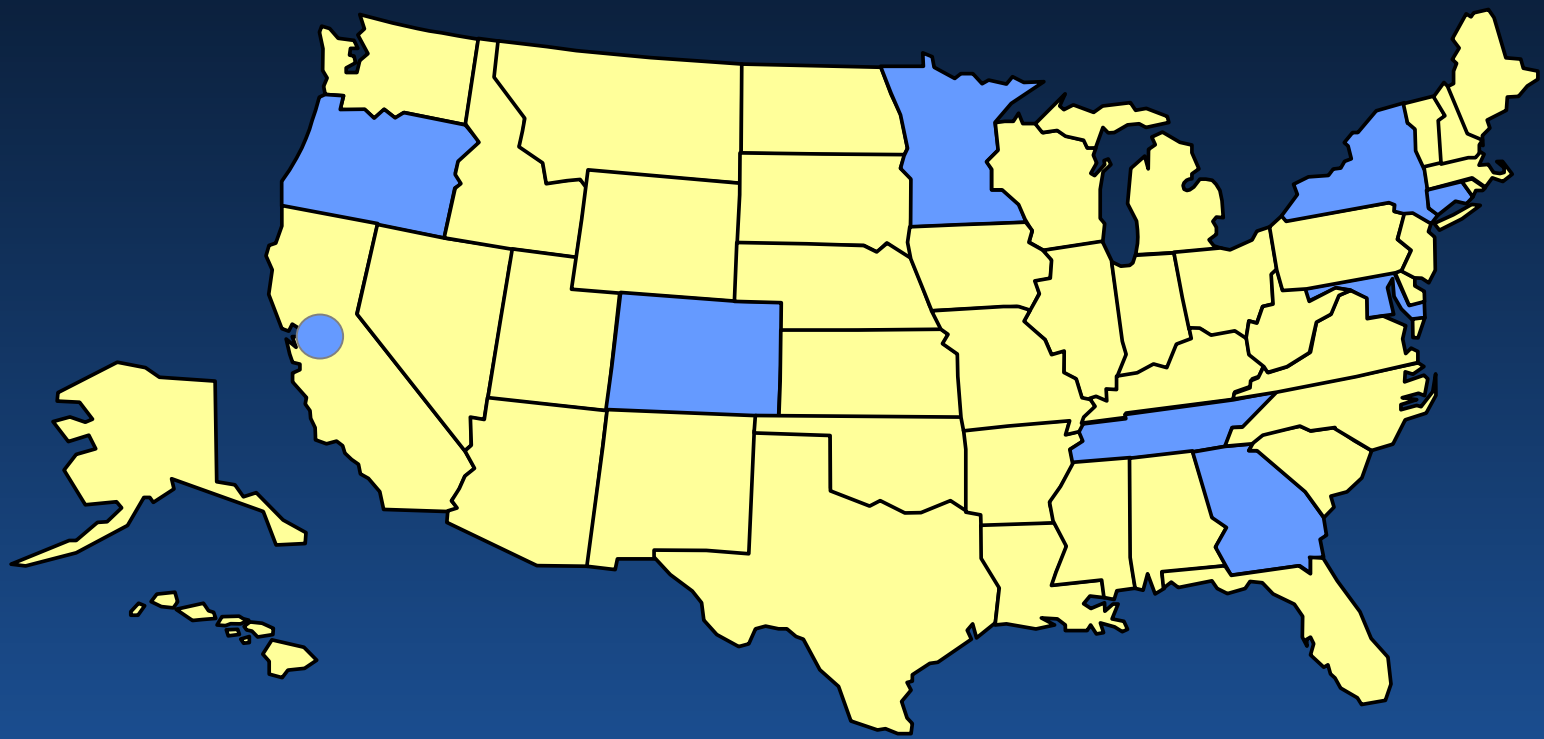
Goal III: Infrastructure and Training

Goal IV: Prevention and Control

Selected Priority Areas

- Antimicrobial Resistance
- Foodborne and Waterborne Diseases
- Vectorborne and Zoonotic Diseases
- Chronic Diseases Caused by Microbial Agents

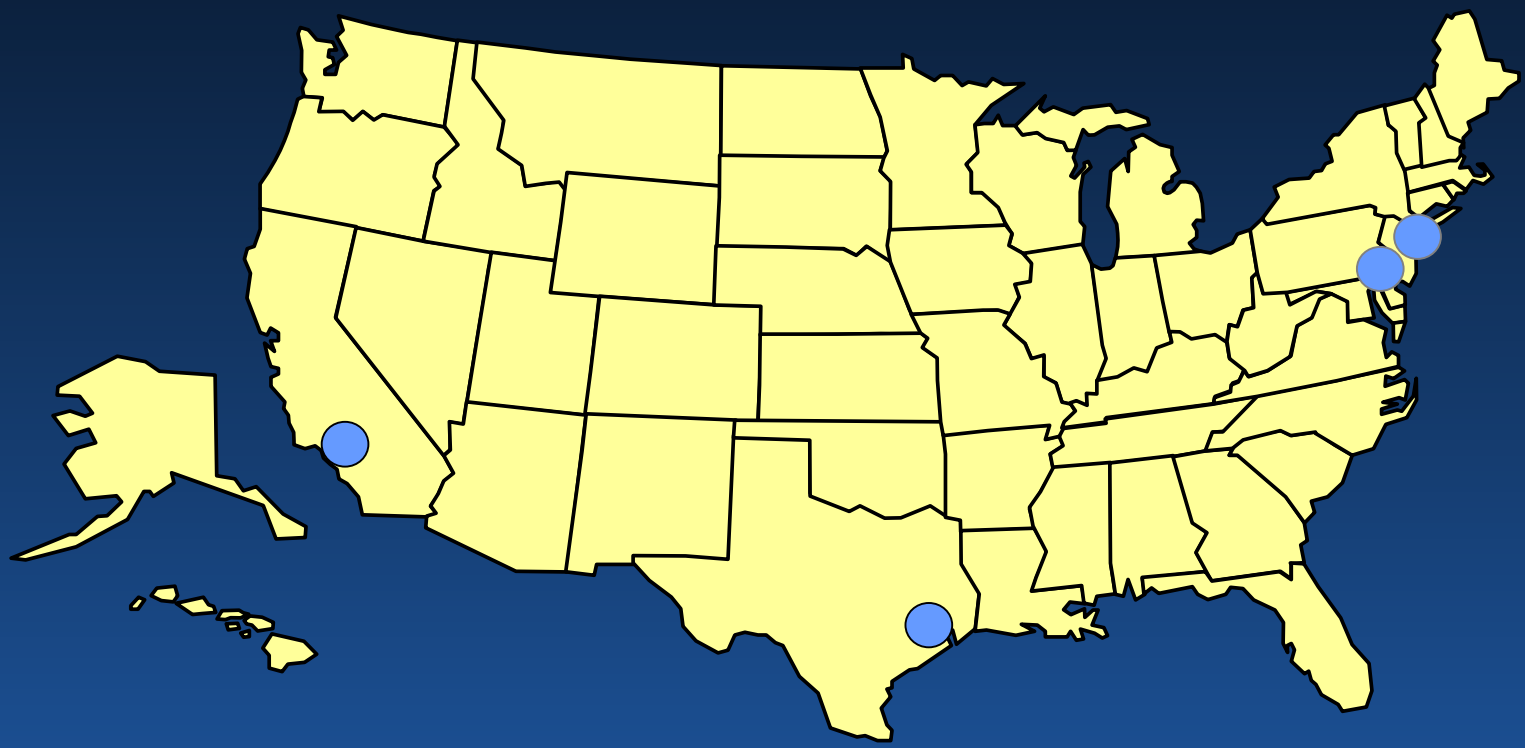
Emerging Infections Programs (EIPs)



Emerging Infections Program Partnerships

- State Health Departments
- Local Health Departments
- State and Local APIC Chapters
- Schools of Public Health
- Schools of Medicine
- Managed Care Organizations
- Medical Examiners

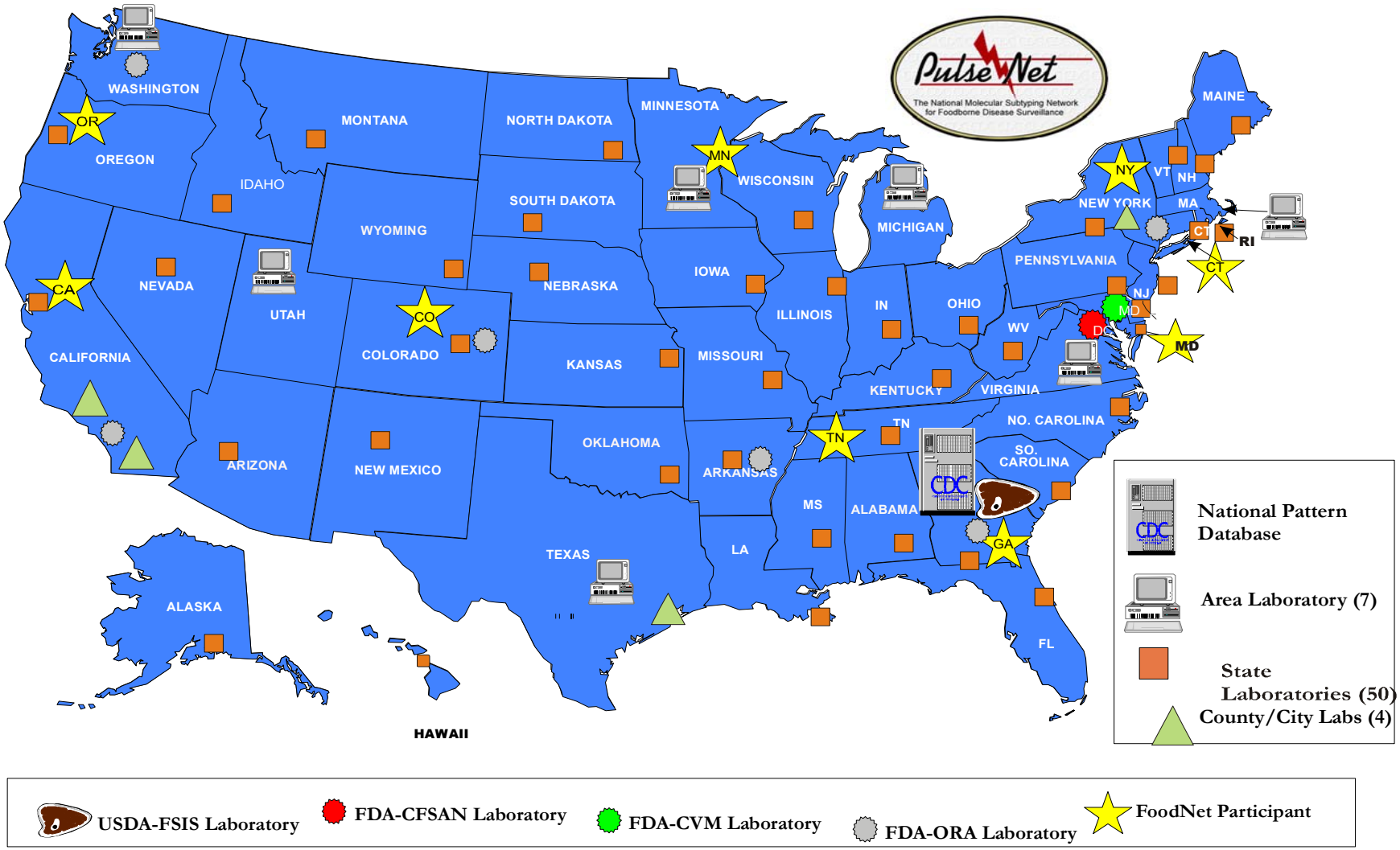
Epidemiology and Laboratory Capacity Support (ELCs)



Public Health Burden of Foodborne Disease

- 76 million cases annually
- 1 in four Americans gets a foodborne illness each year
- 1 in 1000 Americans is hospitalized each year
- $6.5 billion in medical and other costs

The National Molecular Subtyping Network for Foodborne Disease Surveillance

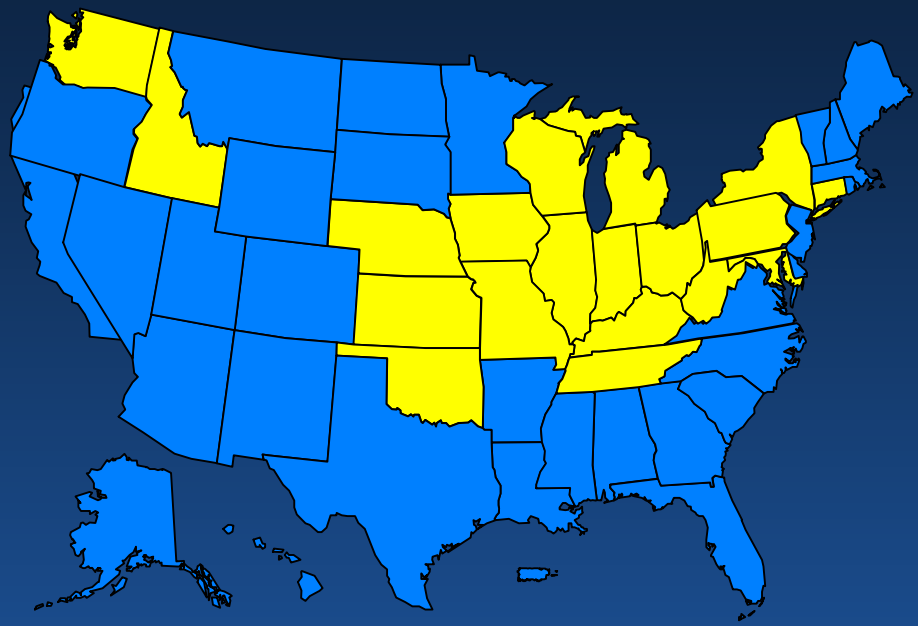


March 2002

Common Source?

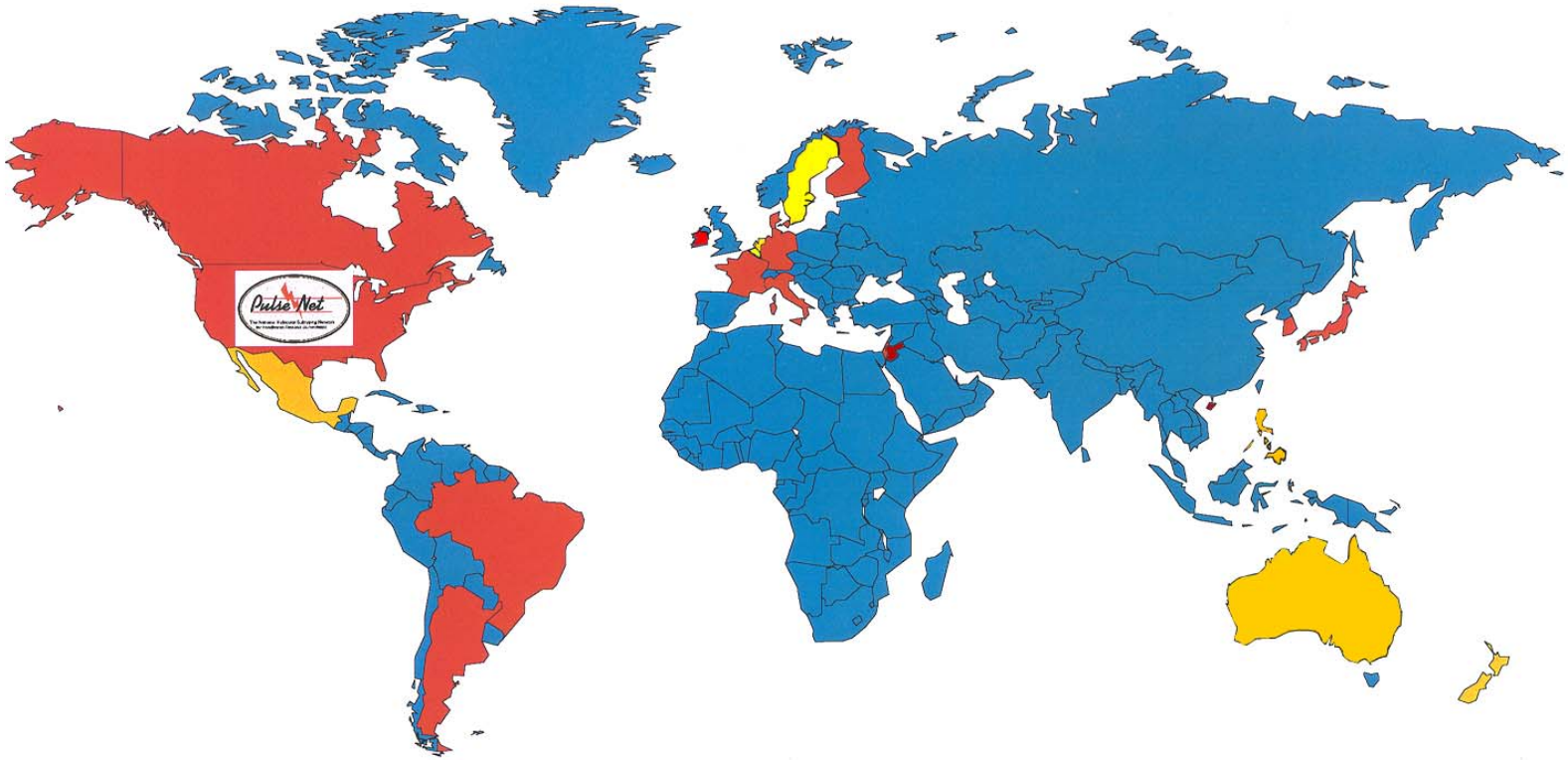
1997 - *Salmonella* Agona with the same PFGE fingerprint identified in 19 States

Investigation:
Toasted oats breakfast cereal



PulseNet International

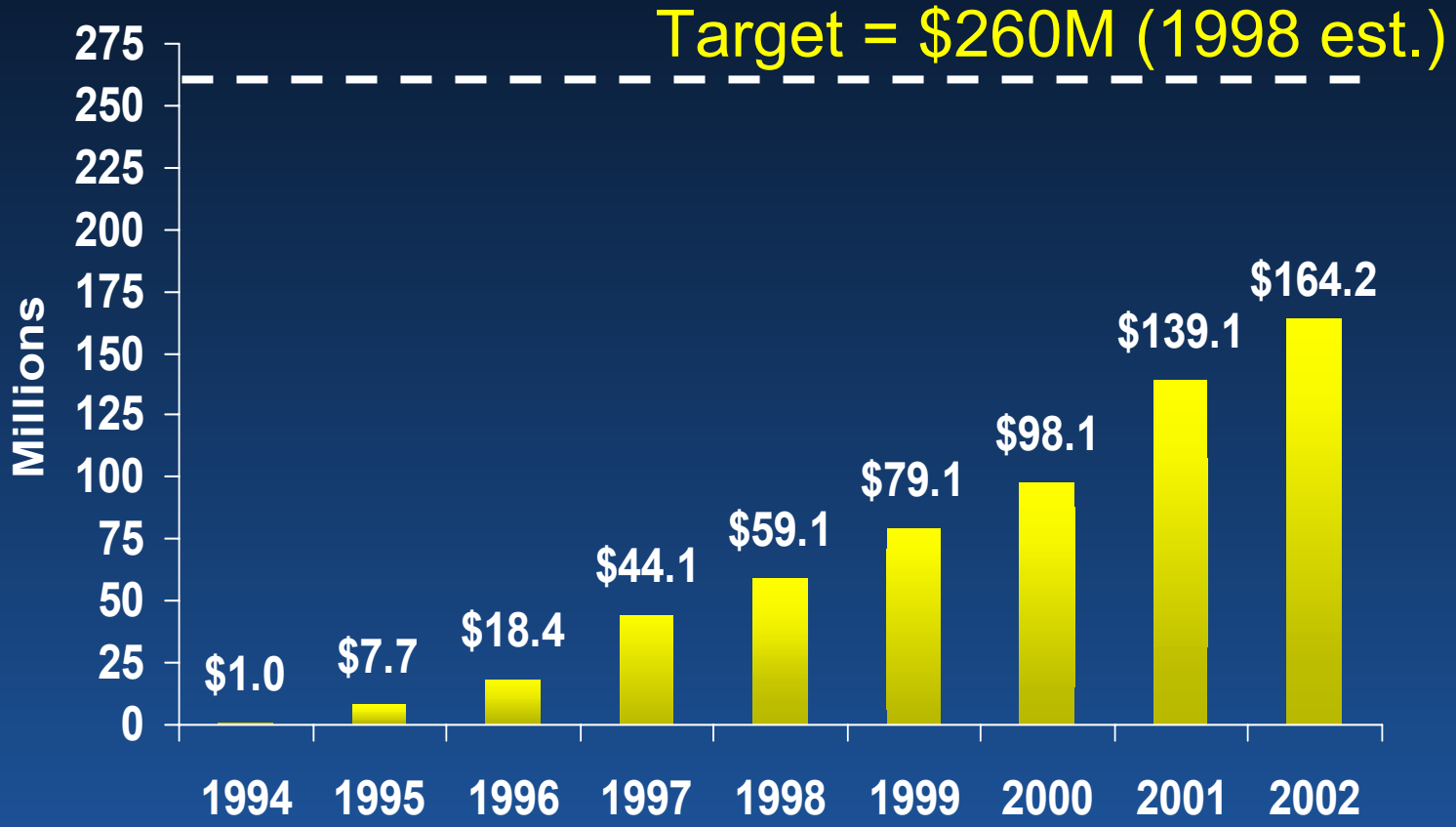
Training and Protocol Distribution



Attended PulseNet workshop at CDC

Received PulseNet protocols from CDC

Emerging Infectious Diseases National Plan Implementation



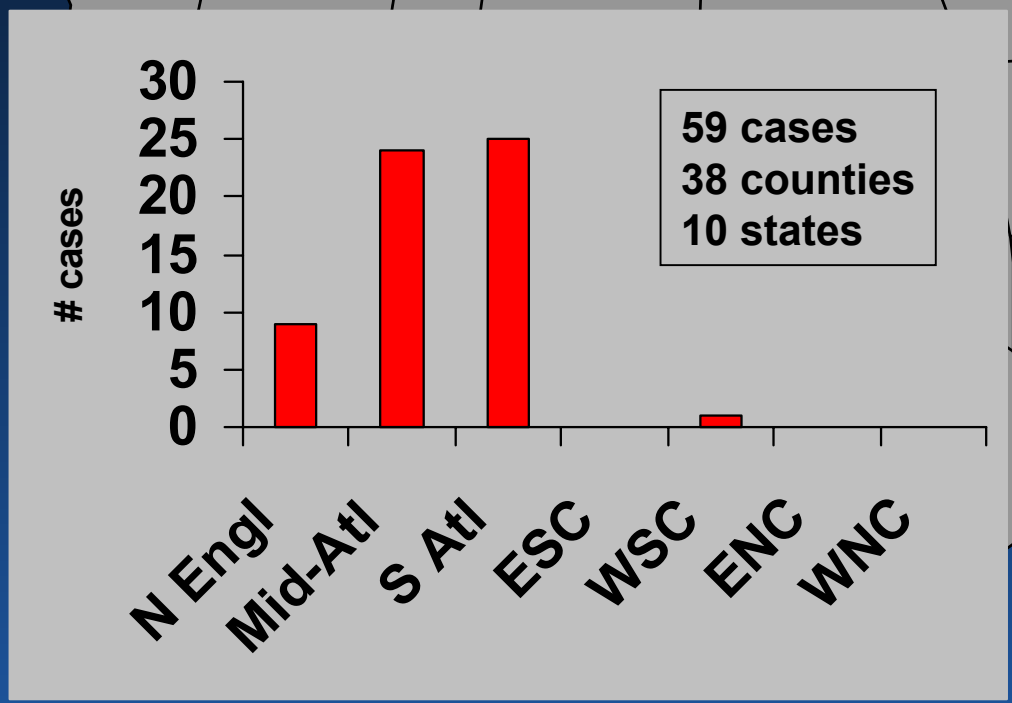
UN Target for Disease Reduction by 2010 G8 Summit, Okinawa, 2000

- HIV: 25% reduction in prevalence in young people
- TB: 50% reduction in deaths
- Malaria: 50% reduction in deaths

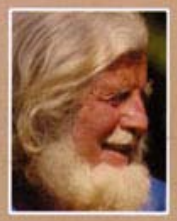
Recent Global Threats

- 93: Hantavirus Pulmonary Syndrome – U.S.
- 94: Plague – India
- 95: Ebola – Zaire
- 96: Variant CJD – U.K.
- 97: H5N1 Influenza – Hong Kong; VISA-Japan, U.S.
- 98: Nipah Virus Encephalitis – Malaysia, Singapore
- 99: West Nile Encephalitis – Russia, U.S.
- 00: Rift Valley Fever – Kenya, Saudi Arabia, Yemen;
  Ebola – Uganda
- 01: Anthrax – U.S.; Foot and Mouth Disease– U.K.
- 02: Stay tuned…

States Reporting Human WNV Disease Cases, 2001*



* As of 2/1/2002

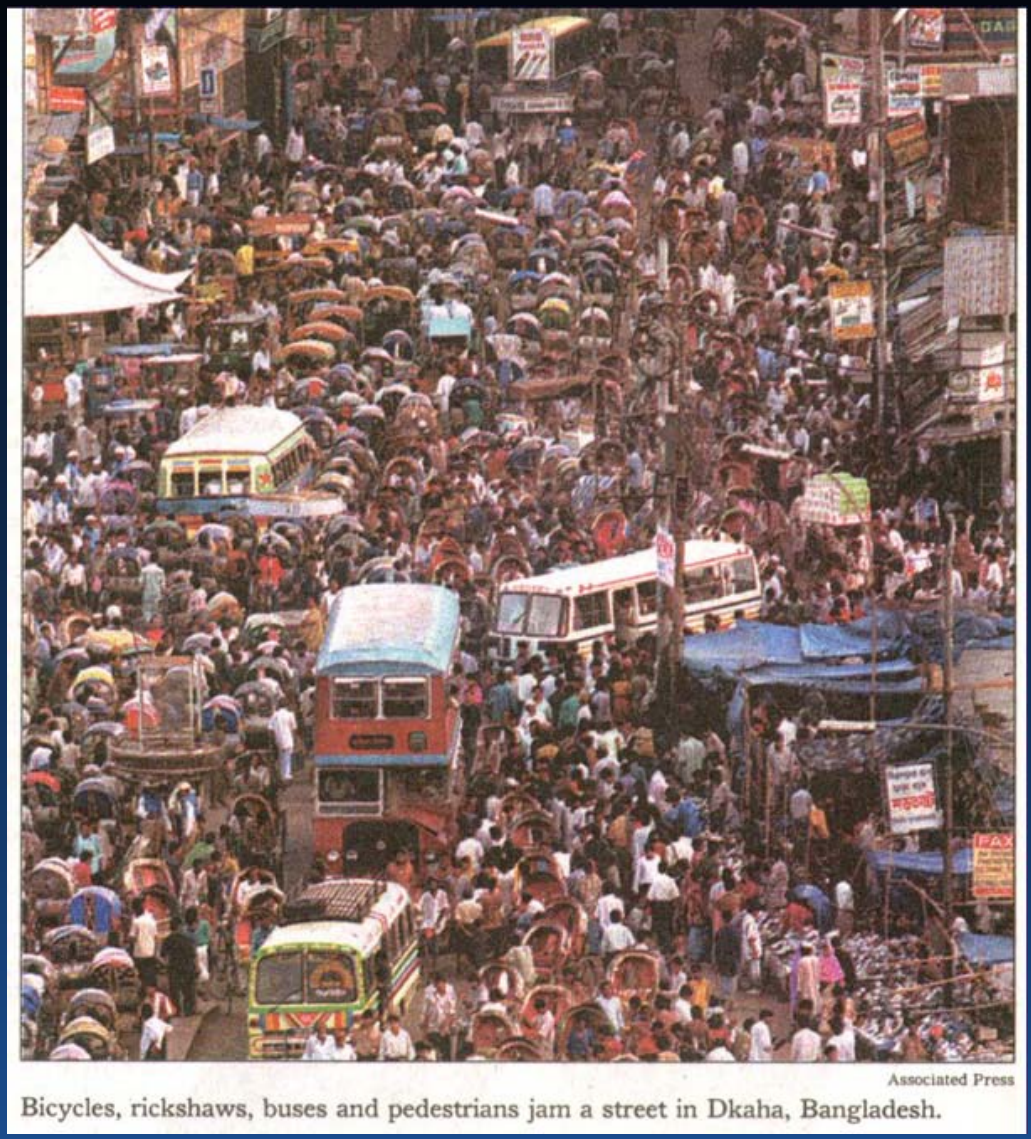


Working with Partners To Improve Global Health

A Strategy for CDC and ATSDR

CDC

ATSDR



Associated Press

Bicycles, rickshaws, buses and pedestrians jam a street in Dkaha, Bangladesh.

NY Times, Sept.18,1999

PROTECTING THE NATION'S HEALTH IN AN ERA OF GLOBALIZATION

CDC's Global Infectious Disease Strategy

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Future Challenges

- Pandemic Influenza
- Antimicrobial Resistance
- International Foodborne Disease Outbreaks
- Urban Yellow Fever in Latin America
- Microbial Etiologies of Chronic Diseases
- The Unexpected

The Flu Pandemic That Might Have Been

The influenza virus is a nasty piece of work that frequently changes its looks to dodge immune attack. But its evasions aren't perfect: Each new strain of the virus bears some resemblance to its predecessors, which means that most people's immune systems will provide some defense against whatever form of influenza they meet. This summer, however, a flu strain known as Type A H5N1, which is unlike any that has infected humans before, appears to have jumped directly from birds to a human, killing a Hong Kong boy. "It's a significant event," says Robert Webster, an influenza specialist at St. Jude Children's Research Hospital in Memphis, Tennessee. "How many people have immunity to H5? Zippo. And if it was transmitted to other humans, that would be scary."

Fortunately, the transmission appears so far to have been an isolated event, but it is drawing intense scientific interest. On 20 August, the U.S. Centers for Disease Control and Prevention (CDC) sent researchers to Hong Kong to join an international team of scientists now conducting an "extensive investigation" there and in mainland China. To date, says CDC epidemiologist Nancy Arden, no other human cases of infection with H5N1 ("H" stands for hemagglutinin and "N" for neuraminidase, both of which are surface proteins of the virus) have been found. But, she notes, the researchers still have their guard up, and they are trying to figure out why this particular virus crossed the species barrier. "When you have a virus that's so easily transmissible and the entire world population is susceptible to it, that's a

Is That an Epidemic — or a Terrorist Attack?

DIALOGUE

Bioterrorism Is the Least of Our Worries

By Jonathan B. Tucker

The news media are fascinated with bioterrorism. After a New Yorker article this week quoted unnamed Central Intelligence Agency analysts who speculated, apparently wrongly, that the outbreak of West Nile-like fever in New York could have been the work of Iraqi terrorists, a number of television news programs reported the story. And earlier this month, ABC's "Nightline" aired a weeklong docudrama in which a hypothetical anthrax attack on the subway system of a major city inflicts more than 50,000 deaths.

This sort of worst-case scenario is extremely unlikely. In truth, most terrorists aren't interested in staging catastrophic biological attacks, and those who are would have significant technical hurdles to overcome.

Over the past century, not a single [illegible] provide technical help, but only at grave risk: the sponsor could lose control over the terrorists and invite severe retaliation if its involvement became known. Or a wealthy terrorist group might try to recruit scientists formerly employed by the Soviet Union, for example, which had advanced bioweapons programs. But no evidence currently available points to such assistance.

Without technical help, small terrorist cells would have a hard time mounting a large-scale biological attack. Germs suitable for warfare are difficult to mass-produce and even harder to disseminate effectively. Microbes might be spread, for example, as an aerosol cloud, but it is technically complex and dangerous to produce a concentrated aerosol that could infect thousands of people. Contaminating urban water supplies is also beyond the ability of most terrorists, mainly because a huge volume of harmful agent would be needed to overcome the effects of dilution, chlorination and filtration.

In the late 1980's in Japan, the Aum Shinrikyo cult, which had vast financial resources, recruited scientists from leading Japanese universities to develop bioweapons. But even though the cult acquired anthrax bacteria and botulinum toxin and carried out several attacks in Japan, no injuries or deaths were reported. The cult then resorted to sarin, a chemical nerve agent. In March 1995, the group released the poison on the Tokyo subway, killing 12 people and injuring more than a thousand.

Given the constraints, a bioterrorist attack in the United States in which thousands of people are killed remains extremely unlikely. While planning for such an event is warranted, government authorities should pay attention to a far more probable scenario: small-scale incidents involving food or drug contamination, which could cause widespread fear and economic disruption. □

A Lethal Weapon We Must Learn to Recognize

By Jessica Stern

CAMBRIDGE, Mass.

The flurry of rumors last week about the origins of the encephalitis outbreak in the New York metropolitan area proved how anxious we are about biological terrorism.

After an article in The New Yorker quoted unnamed Central Intelligence Agency sources who speculated that the West Nile-like virus might have been spread in an Iraqi biological attack, the C.I.A. found itself having to reassure the public that this chain of events was highly unlikely.

And indeed, it is.

For one thing, West Nile encephalitis is a relatively mild disease, and Saddam Hussein has far more virulent agents in his arsenal. For another, the outbreak has all the earmarks of a naturally occurring infectious disease, according to the Centers for Disease Control and Prevention.

But this case illustrates one of the most troubling aspects of biological terrorism: it can be extremely difficult to distinguish germ warfare from a natural outbreak of disease.

After all, this is not the first time that biological attacks have been blamed for sudden epidemics. In 1997, when foot-and-mouth disease struck pigs in Taiwan for the first time in 83 years, the Taiwanese Government was forced to slaughter some four million hogs. Taiwanese farmers, without any evidence, suspected that China had deliberately introduced the disease on the island to damage the economy.

After Cuba suffered an epidemic of dengue fever in 1981, it accused the United States of biological aggression. In 1997 Cuba made a similar claim, charging that the United States had dropped crop-eating pests from a low-flying plane.

On the rare occasions when biological weapons have been used or accidentally released, scientists and government officials often first assumed that the epidemics were natural outbreaks.

Our uncertainty about a virus's origin is a warning.

For instance, many American security experts initially believed that a 1979 outbreak of anthrax in the Soviet Union was caused by contam[illegible]

Jessica Stern, a fellow at Harvard's Center for Science and International Affairs, is the author of "The Ultimate Terrorist."

NY Times, Oct. 16, 1999

1902-2002 Celebrating 100 Years of International Public Health in the Americas

PERSPECTIVES in Health

Volume 6 No. 2 • 2002

The Magazine of the Pan American Health Organization *Regional Office of the* World Health Organization

September 11: Everything Changed

Bioethics Through Comics (p. 22)

www.paho.org

Ongoing Investigation of Anthrax — Florida, October 2001

On October 4, 2001, the Palm Beach County Health Department (PBCHD), the Florida State Department of Health (FSDOH), and CDC reported a case of anthrax in a 63-year-old resident of Florida. The patient was hospitalized with the respiratory form of anthrax and subsequently died. PBCHD, FSDOH, and CDC initiated an epidemiologic investigation and public health surveillance to identify how infection with *Bacillus anthracis* occurred and to identify other infections. An environmental investigation identified one sample taken from the patient's workplace (America Media Inc. [AMI], Boca Raton, Florida) as positive for anthrax. *B. anthracis* also was identified in one nasal sample from another worker in the same building, which suggests exposure. Testing of additional samples is in progress. Public health officials, in conjunction with the Federal Bureau of Investigation, are continuing the investigation.

MMWR 2001;50:877

Anthrax Found in NBC News Aide

Suspicious Letter Is Tested at Times — Wide Anxiety

By DAVID BARSTOW

An assistant to the NBC anchor Tom Brokaw has tested positive for anthrax infection more than two weeks after she opened a threatening letter addressed to Mr. Brokaw that contained a white powder, officials said yesterday.

Even as law enforcement officials were cordoning off Rockefeller Center, the newsroom at The New York Times was evacuated when a reporter opened an envelope that also contained a white powder.

The substance was still being tested last night, as investigators explored potential links between the two incidents. Both letters were mailed from St. Petersburg, Fla., and had similar handwriting, according to law enforcement officials.

The reports of possible bioterrorism caused widespread anxiety in New York and across the country. People depleted supplies of antibiotics at drugstores and besieged their doctors. Offices were evacuated after a spate of threats, and companies made emergency adjustments to the way they received mail. [Page B9.]

The NBC case marked the second time an American has been stricken with a form of anthrax since the Sept. 11 terror attacks.

In the other case, a man died after he contracted an inhaled form of the disease at a newspaper office in Boca Raton, Fla. Two other people at the office were exposed to anthrax

Reuters

Mayor Rudolph W. Giuliani after a news conference yesterday at NBC, where he tried to calm new fears that were raised by an anthrax case.

NY Times, Oct 13, 2002

“Reconstruction of biodefenses must be regarded as a branch of public health.”

Joshua Lederberg
National Academy of Sciences
January 22, 1999

Public Health Preparedness

Public health is a cornerstone of health protection and public safety, yet it has long been relegated to the backseat of our nation's priorities for attention and support. We can't let it stay there. The events of September 11 and the subsequent anthrax attacks have brought new urgency to old concerns about the capacity of our nation's public health system. These tragic circumstances may provide the political will to do what should have been done earlier to protect our citizens against significant infectious disease threats, whether naturally occurring or intentionally imposed.

Our complacency arose from different causes. Many assumed that advances in science and medicine made public health programs obsolete; a view reinforced, ironically, because when functioning well, the contributions of public health are often invisible to the public. Public health measures have sometimes been the victim of their own success: We know that there are periodic outbreaks of infectious disease, but the successful prevention or control of each epidemic conceals the years of neglect that have eroded the institutional capabilities of public health agencies and left them ill-equipped to do their jobs.

What is to be done? Local, state, and federal public health agencies working together represent the backbone of effective response to a major outbreak of infectious disease, including a bioterrorist attack. How quickly we recognize threats and act on them dramatically influences our ability to reduce casualties, control contagion, and minimize panic and disruption. Upgrading current public health capacities is vital, but it will require enhanced investment on many levels and must be sustained.

Hamburg, MA. Science 2002;295:1425

" Looking to the future, we can expect an increasing array of infectious disease threats. Our public health system will be challenged to confront both routine and unexpected outbreaks of disease, including possible acts of bioterrorism. We have a chance to defend the nation against its adversaries and improve the public health system with the same steps. We must do it."

Margaret A. Hamburg
Science 2002;295:1425

State and Local Support

- $918 M
- Budget period 2/19/02 – 8/30/03
- Proposals due 4/15/02
- Awards 5/15/02

Public Health Preparedness: State and Local Support

Priorities

- Bioterrorism
- Other infectious disease outbreaks
- Other urgent public health threats

Bioterrorism Preparedness and Response

Clinicians and Public Health Agencies as Essential Partners

Julie Louise Gerberding, MD, MPH

James M. Hughes, MD

Jeffrey P. Koplan, MD, MPH

BEGINNING IN MID-SEPTEMBER 2001, THE UNITED States experienced unprecedented biological attacks involving the intentional distribution of *Bacillus anthracis* spores through the postal system.[1] The full impact of this bioterrorist activity has not been assessed, but already the toll is large. A total of 22 persons have developed anthrax and 5 have died as a direct result.[2-5] More than 10000 persons were advised to take postexposure prophylactic treatment because they were at known or potential risk for inhalational anthrax; in addition, more than 20000 others started such treatment until the investigation provided reassurance that exposure was unlikely and treatment could be stopped; thousands more were vic-

occupation, must be addressed in bioterrorism preparedness and response programs.

From the public health perspective, recognition and response to the recent bioterrorist attacks has evolved in a series of overlapping phases at each location. The initial phase involved detection and then confirmation of a case of anthrax or a powder-containing envelope, followed by rapid deployment of public health and law enforcement personnel and other needed resources to the site. The second phase has been characterized by full-scale investigations as well as interventions to prevent additional cases. Longer-term consequence management, including follow-up of affected individuals and remediation of contaminated sites that could pose an occupational health risk, are major activities in the current phase. In all these phases, clinicians have proven to be essential partners, which is a lesson that must be incorporated into future bioterrorism preparedness and re-

JAMA 2002;287:898

EMERGING INFECTIOUS DISEASES

EID Online
www.cdc.gov/eid

A Peer-Reviewed Journal Tracking and Analyzing Disease Trends Vol.8, No.1, January 2002

EMERGING INFECTIOUS DISEASES

EID

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National Center for Infectious Diseases,
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The Centers for Disease Control and Prevention,
and The Association of Public Health Laboratories

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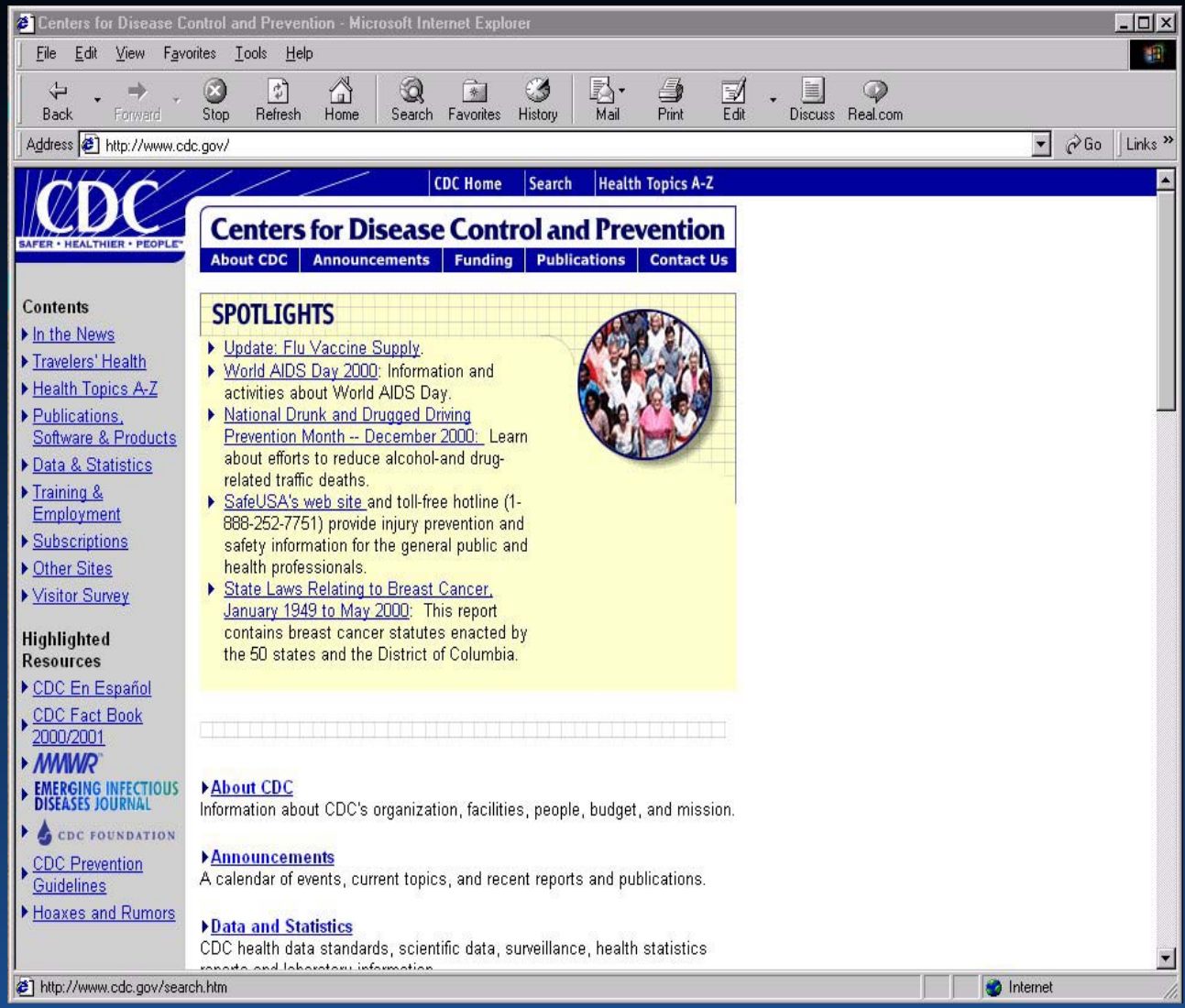
Centers for Disease Control and Prevention - Microsoft Internet Explorer
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MMWR
EMERGING INFECTIOUS DISEASES JOURNAL
CDC FOUNDATION
CDC Prevention Guidelines
Hoaxes and Rumors
SPOTLIGHTS
Update: Flu Vaccine Supply.
World AIDS Day 2000: Information and activities about World AIDS Day.
National Drunk and Drugged Driving Prevention Month -- December 2000: Learn about efforts to reduce alcohol-and drug-related traffic deaths.
SafeUSA's web site and toll-free hotline (1-888-252-7751) provide injury prevention and safety information for the general public and health professionals.
State Laws Relating to Breast Cancer, January 1949 to May 2000: This report contains breast cancer statutes enacted by the 50 states and the District of Columbia.
About CDC
Information about CDC's organization, facilities, people, budget, and mission.
Announcements
A calendar of events, current topics, and recent reports and publications.
Data and Statistics
CDC health data standards, scientific data, surveillance, health statistics
http://www.cdc.gov/search.htm
Internet

www.cdc.gov

"... there is little reason for complacency. Victories are often temporary. Our microbial enemies are incredibly adept at developing new defenses and weaponry and at jumping to new species to create new emerging infections."

Gro Harlem Brundtland
Science 1998;280:2027

“New and reemerging infectious diseases will pose a rising global health threat and will complicate U.S. and global security over the next 20 years.”

National Intelligence Estimate; The Global Infectious Disease Threat and Its Implications for the United States, 2000