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CDC Update

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The findings and conclusions in this report are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Executive Summary

- Foodborne illnesses are still very common.
- Morbidity > mortality.
- Norovirus most common, viral; human reservoir.
- Salmonella & Campylobacter most common bacterial; animal reservoir
- Declines in Campylobacter, Listeria, Shigella, STEC O157 & Yersinia infections. Little change in Salmonella. Vibrio increasing.
- “New” Outbreaks increasingly being recognized & difficult to manage (research, surveillance, detection, traceback, response)
- To control risk routinely & during outbreaks, need multi-agency, multi-disciplinary, industry-federal-state collaboration

Key Winnable Battles for Public Health

Tobacco



Healthcare-Associated Infections



**Nutrition,
Physical Activity,
Obesity and
Food Safety**



**Motor
Vehicle
Injuries**



HIV

**Teen
Pregnancy**



Nutrition, Physical Activity, Obesity, and Food Safety

- ❑ From 1980–2000, obesity rates doubled for adults, tripled for children
- ❑ Sodium reduction = 100,000 fewer deaths annually
- ❑ Artificial trans fat elimination = tens of thousands fewer deaths annually
- ❑ **Complex, globalized food supply and tens of millions of foodborne illnesses annually in U.S.**
- ❑ **How it can be addressed:**
 - Change environment to promote healthy food and active living
 - Address food procurement
 - **Improve foodborne illness surveillance, detection, response and prevention**



Focus action in three areas

- **Discovery** – Tracking trends and risk factors, defining the burden, finding new pathogens and drug resistance, and attributing illness to specific foods
- **Innovation** – Developing new tools, methods, and analytics in epidemiology, laboratory science, and environmental health
- **Implementation** – Sharing new technology and information with industry, local, state, and federal partners; improving communications; and targeting information to guide policy



CDC support for the Food Safety Modernization Act

- ❑ International expertise in foodborne illness
- ❑ Strong partnerships with federal, state, and local public health agencies
- ❑ Laboratory, epidemiologic, and environmental health networks
- ❑ Systems and agreements for surveillance and data exchange
- ❑ Communications with the public health community, industry, and consumers



“This law represents a sea change for food safety in America, bringing a new focus on prevention.”

*– Margaret A. Hamburg, MD
Commissioner of Food and Drugs*

CDC FSMA lead responsibilities

- Enhancing **Foodborne Illness Surveillance Systems** to improve the collection, analysis, reporting, and usefulness of data
- Establishing a **Working Group** of diverse experts and stakeholders to provide the Secretary advice and recommendations on the **improvement of foodborne illness surveillance**
- Designating **Integrated Food Safety Centers of Excellence** to serve as resources for federal, state, and local public health professionals

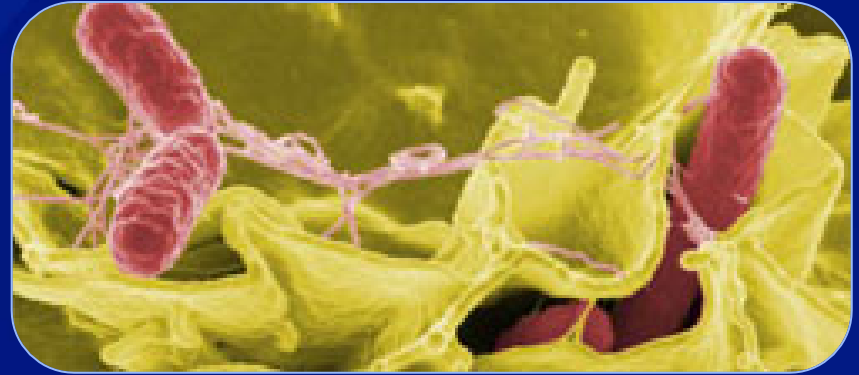
CDC FSMA Surveillance

Current components and plans

- Maintain epidemiological, laboratory, environmental health capacity
- Continue improvements in sharing existing data
- Develop new investigation tools and laboratory methods
 - Expand the number of FoodCORE sites (funds permitting)
 - Next generation PulseNet
 - Launching a National Voluntary Environmental Assessment Surveillance System (NVEAIS)
- Enhance collaboration with partners
- Augment capacity to more accurately attribute illness to specific foods

Foodborne Illness is common and costly

- Each year, 48 million Americans get sick, 128,000 hospitalized and 3,000 die as a result
- Reducing foodborne illness by just 10% would keep 5 million people a year from getting sick
- *Salmonella* infections alone are responsible for \$365 million in direct medical costs annually



“That's an unacceptable price to pay for contaminations that are mostly preventable.”

– Kathleen Sebelius, Secretary of Health and Human Services

What about vulnerable groups?

TABLE 2. Incidence* of laboratory-confirmed bacterial and parasitic infection cases, by age group and pathogen — Foodborne Diseases Active Surveillance Network, United States, 2010†

Pathogen	Age group (yrs)				
	<5	5–9	10–19	20–59	≥60
Bacteria					
<i>Campylobacter</i>	24.4	10.6	10.1	13.3	13.9
<i>Listeria</i>	0.3	0.03	0.05	0.1	1.1
<i>Salmonella</i>	69.5	21.4	12.3	12.2	17.0
<i>Shigella</i>	16.4	11.7	2.2	2.5	1.1
STEC O157	3.3	2.5	1.1	0.5	0.7
STEC non-O157	5.0	1.1	1.3	0.5	0.5
<i>Vibrio</i>	0.0	0.3	0.2	0.4	0.8
<i>Yersinia</i>	1.9	0.4	0.2	0.2	0.4
Parasites					
<i>Cryptosporidium</i>	5.1	2.7	2.5	2.6	2.5
<i>Cyclospora</i>	0.0	0.0	0.02	0.1	0.1

Abbreviation: STEC = Shiga toxin–producing *Escherichia coli*.

* Per 100,000 population.

† Data are preliminary.

Estimated Burden Associated with Food

- | | |
|----------------------------|--------------------|
| 1. Norovirus | (5.5 million, 58%) |
| 2. Salmonella spp. | (1.0 million) |
| 3. C.perfringens | (1.0 million) |
| 4. Campylobacter | (0.8 million) |
| 5. Staphylococccous aureus | (0.24 million) |
| 6. Shigella | (0.13 million) |
| 7. STECnon-O157 | (0.12 million) |
| 8. Yersinia enterocolitica | (0.097 million) |
| 9. Toxoplasma gondii | (0.09 million) |
| 10. Giardia intestinalis | (0.077 million) |

Attributing illness and risk to foods

The 2011 estimates of foodborne diseases will help CDC and its partners set priorities and reduce illness from food.

Focus on attributing illnesses to specific foods and refining cost estimates of foodborne illness.



Causes of illness in 1,565 outbreaks of single food commodities, 2003-2008

13 New Food Vehicles Identified in US Multistate Outbreaks since 2006

- bagged spinach
- carrot juice
- peanut butter
- broccoli powder on a snack food
- dog food
- pot pies/frozen meals
- canned chili sauce
- hot peppers
- pepper
- raw cookie dough
- hazelnuts
- whole fresh papayas
- pine nuts



Data Sources: Foodborne Disease Outbreak Surveillance System, CDC Web postings

Surveillance, Detection and Response in action

Timeline: Multistate Outbreak of Listeriosis

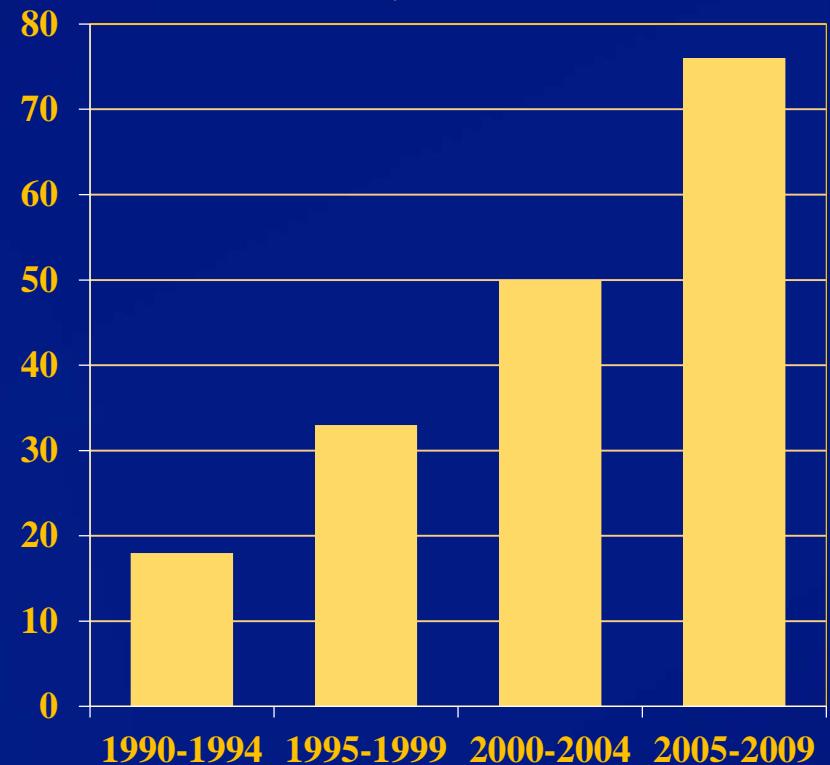
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|--------------|---|
| 9/2 | -Colorado sees ~ 10 Listeria cases/year
-7 Listeria cases in one week found with routine surveillance
-Began interviewing |
| 9/6 | -PulseNet identified two PFGE pattern combinations in the cluster of clinical isolates |
| 9/9 | -Interviews identified a culprit: cantaloupe
-Warning issued to Colorado residents |
| 9/10 | -PulseNet matched cases outside of Colorado |
| 9/12 | -National Warning issued |
| 9/14 | -Jensen Farms issued voluntary recall |
| 10/18 | -146 cases, 28 states, 31 deaths, one miscarriage |

Common and Complicated Outbreaks

- Multistate outbreaks detected more frequently
- Each year, >150 national or multistate and >10,000 state and local investigations

5 year total number of
multistate outbreaks

Multistate foodborne disease outbreaks, 1990-2009



Foodborne Illness Surveillance, Response and Data Systems at CDC

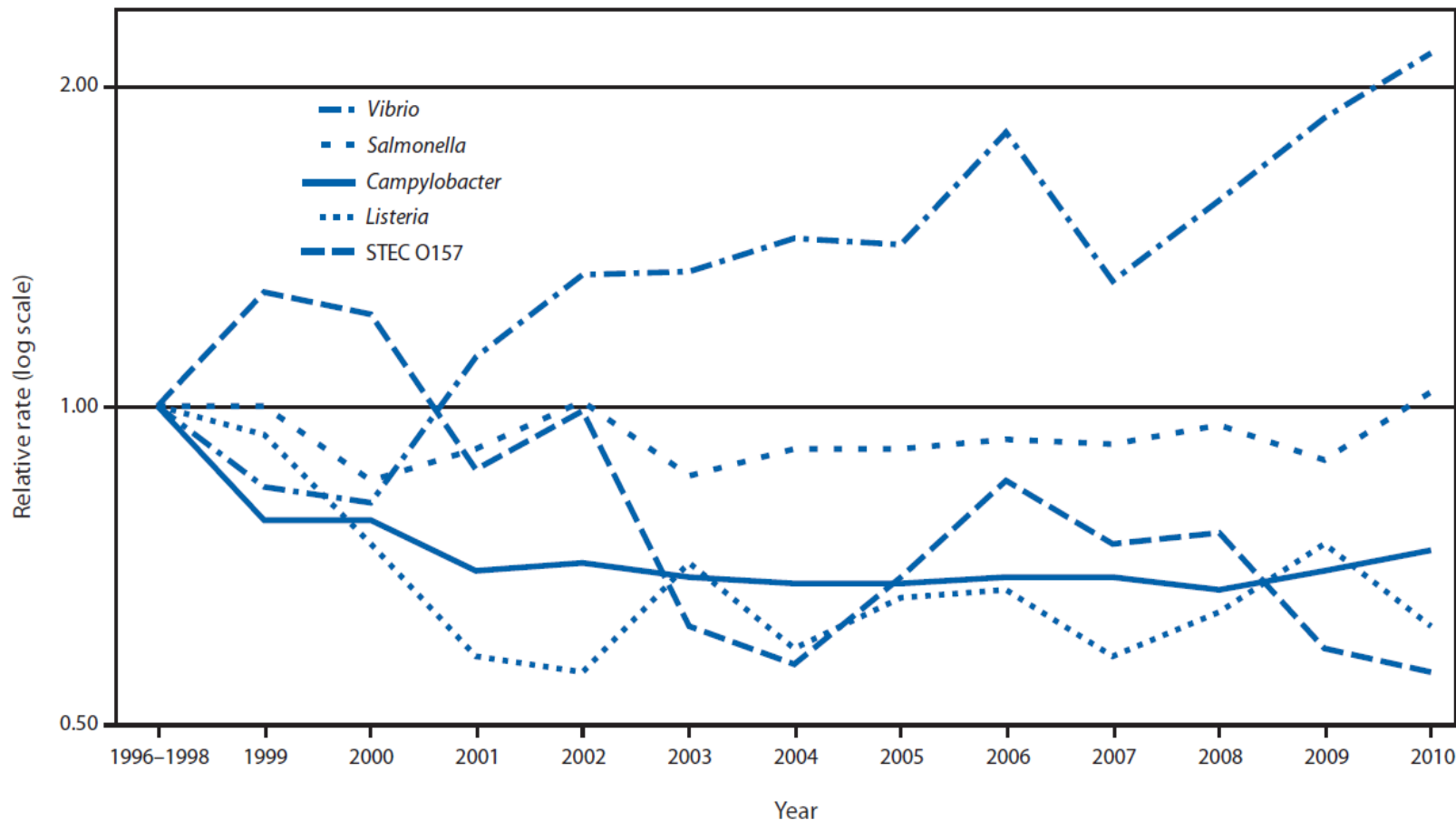
- ❑ Foodborne Disease Outbreak Surveillance (NORS)
- ❑ FoodNet
- ❑ Laboratory-based Enteric Disease Surveillance (LEDS)
- ❑ National Antimicrobial Resistance Monitoring System (NARMS)
- ❑ National Notifiable Disease Surveillance System
- ❑ Norovirus (CaliciNet)
- ❑ NVEAIS (EHS-Net)
- ❑ PulseNet

2010 FoodNet Summary

- Overall the incidence of infection with 6 key foodborne pathogens was 23% lower
- In comparison with the first years of FoodNet surveillance (1996–1998), we see sustained declines in the incidence of infections caused by:
 - *Campylobacter*,
 - *Listeria*,
 - Shiga toxin–producing *Escherichia coli* (STEC) O157,
 - *Shigella*
 - *Yersinia*
- National Healthy People 2010 target for STEC O157 infection (≤ 1.0 case per 100,000 population) was reached in 2009 & the decline was sustained in 2010

Trends in Foodborne Diseases, FoodNet, 1996-2010

FIGURE 1. Relative rates of laboratory-confirmed infections with *Campylobacter*, STEC O157, *Listeria*, *Salmonella*, and *Vibrio*, compared with 1996–1998 rates, by year — Foodborne Diseases Active Surveillance Network, United States, 1996–2010*



Abbreviation: STEC = Shiga toxin-producing *Escherichia coli*.

* The position of each line indicates the relative change in the incidence of that pathogen compared with 1996–1998. The actual incidences of these infections cannot be determined from this graph.

What about *Salmonella*?

- *Salmonella* was farthest from its national target
 - 17.6 cases per 100,000 population in 2010; the Healthy People 2010 target is ≤ 6.8 cases per 100,000 population
- No statistically significant difference in 2010 rates compared with the first three (1996-1998) years of surveillance

Environmental Health Specialists Network (EHS-Net)

- Is a network of EHS and EPI
 - federal health agencies (CDC, USDA, FDA)
 - 9 state/local health agencies
- Uses systems approach to understand food & waterborne illness
- Identifies
 - Contributing factors leading to risk factors and/or illness
 - Root causes (environmental antecedents) causing the risk factors
- Helps describe
 - Risk factors
 - System variability
 - Relationships between risk factors
 - How the relationships between risk factors cause system variability



EHS-Net

EHS-Net Research Program



Understanding/Describing:

- 1) Current behavior
- 2) Factors affecting behavior



Improving Behavior

National Voluntary Environmental Assessment Information System (NVEAIS)

- Identify factors that can be routinely monitored by food control authorities to prevent or reduce the risk of foodborne outbreaks
 - Characterize food vehicles and monitor trends
 - Identify and monitor contributing factors and environmental antecedents
 - Hypothesis generation
 - Guide planning, implementation and evaluation of food safety programs
- 2010 Conference for Food Protection recommended to amend FDA's Voluntary National Retail Food Regulatory Program Standards, Standard 5, Foodborne Illness and Food Defense Preparedness and Response

2012 Status

- NVEAIS

- Open for National Use 2012



- E-Learning Training program

- Foodborne Illness Outbreak Environmental Assessment Training
- Module 1 Launch is expected in the Summer 2012
- In order to participate in NVEAIS CDC's Foodborne Illness Outbreak Environmental Assessment Training must be completed

Selected EHS-Net Findings

Associated Factors

- **Factors Associated with Hand Washing**

- Observed food workers more likely to wash their hands:
 - When they were less busy
 - When they did not wear gloves
 - In restaurants:
 - That provided worker food safety training
 - With more than one hand sink
 - With a hand sink in observed worker's sight



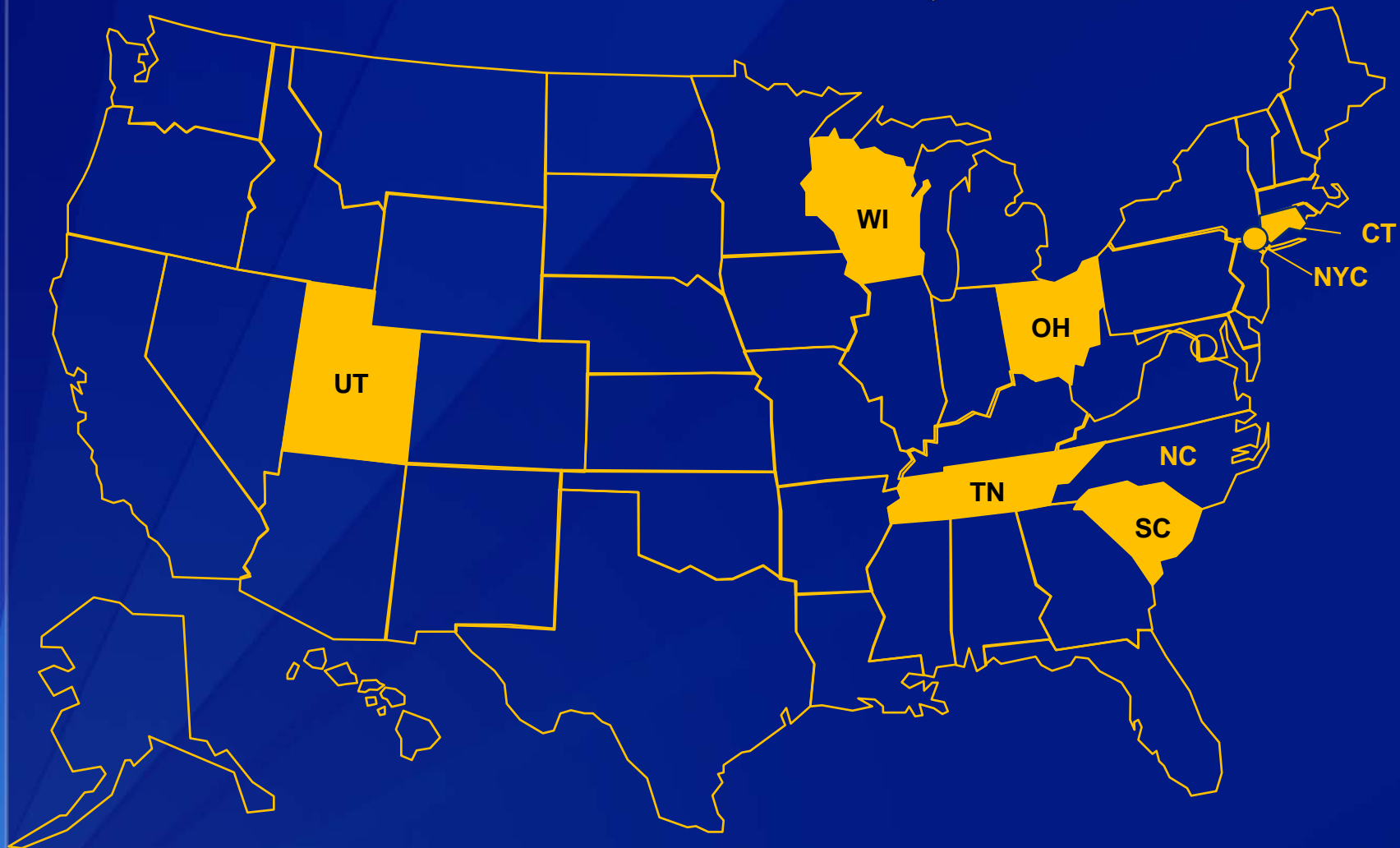
Selected EHS-Net Findings

Associated Factors

- **Factors Associated with Working While Ill**
 - Workers were less likely to report having worked with vomiting or diarrhea:
 - When they were female
 - In restaurants that:
 - Were less busy
 - Had a policy requiring workers to tell managers when they are ill
 - That sometimes or always had a worker on call
 - Had experienced managers



FoodCORE Sites, 2012

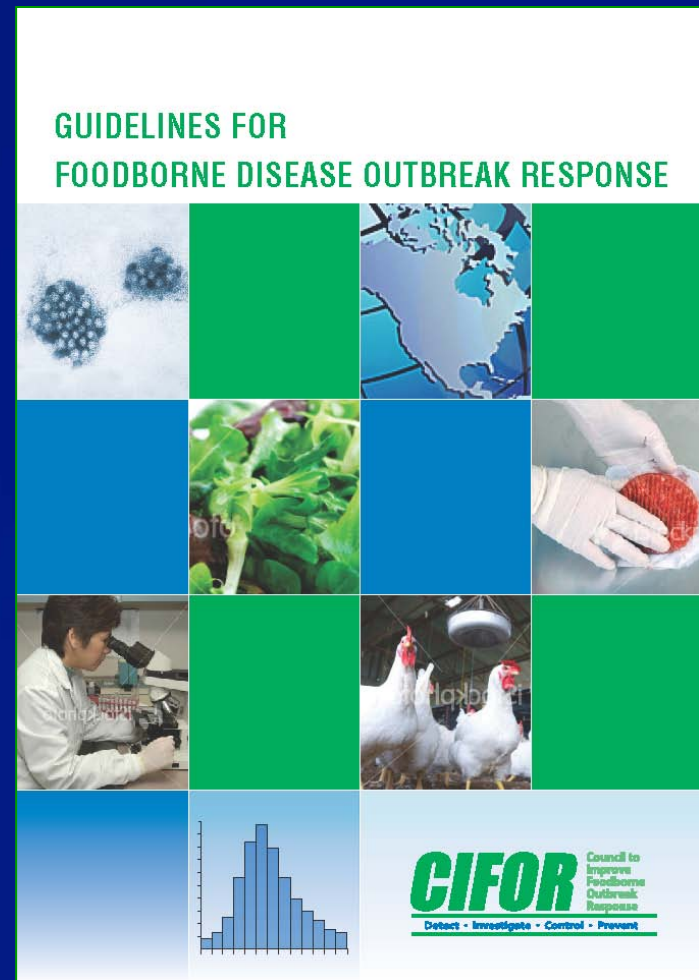


Seven sites participate, covering about 13% of the U.S. population, or 41 million individuals. All estimates are from quickfacts.census.gov, 2010. In some states, FoodCORE does not cover 100% of the state population. Additionally, North Carolina is a partially funded site participating in the project through June 2012.

Defining model practices: CIFOR

Measuring performance

Goal is to increase capacity and improve programs to detect, investigate, control, prevent, and report foodborne illness and outbreaks.



“Epi-Ready was a useful training since it provided the opportunity for Lab, Epi and EHSto sit around the table and outline the steps of an outbreak from beginning to end.”

More than 2,400 graduates since 2003

Reaching out to state and local partners



- Expand and improve national surveillance for foodborne illness with state and federal partners
- Expand and improve environmental investigations
- Share data through new approaches for messaging (RSS feeds, Twitter)
- Support and enhance EHS-Net
- Support and enhance PulseNet capacity at state and national levels
- Increase the number FoodCORE sites to build investigative capacity
- Support the Council to Improve Foodborne Outbreak Response

“I am the one asking you – on behalf of myself, my family, and the 1,500 others who were sickened – please make our food system safe.”

– *Testimony from the congressional hearing, “The Outbreak of Salmonella in Eggs,” Sept. 22, 2010*



Thank you!
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