PUBLIC HEALTH GRAND ROUNDS

HEALTH

Office of the Director

December 17, 2009

FROM RIGOROUS SCIENCE

TO IMPACTFUL PRACTICE

PUBLIC HEALTH GRAND ROUNDS

CDC Connects

Tuesday, November 17, 2009

Office of The Director

CDC Connects > Office of The Director > The Director > Archives

Grand Rounds

The Public Health Grand Rounds is a monthly series created to further strengthen CDC's common scientific culture and foster discussion and debate on major public health issues. Each session of the Public Health Grand Rounds will focus on key issues and challenges related to a specific health topic, including cutting-edge scientific evidence and potential impact of different interventions. The sessions will also highlight how CDC is already addressing these challenges and discuss the recommendations for future research and practice.

Grand Rounds sessions are typically held on the third Thursday of every month at Roybal's Global Communications Center, Auditorium A, between 9-10 a.m. For those unable to attend, the sessions will be available on CDC IPTV.

http://intranet.cdc.gov/od/odweb/about/directorGrandRounds.htm

PUBLIC HEALTH GRAND ROUNDS

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Grand Rounds

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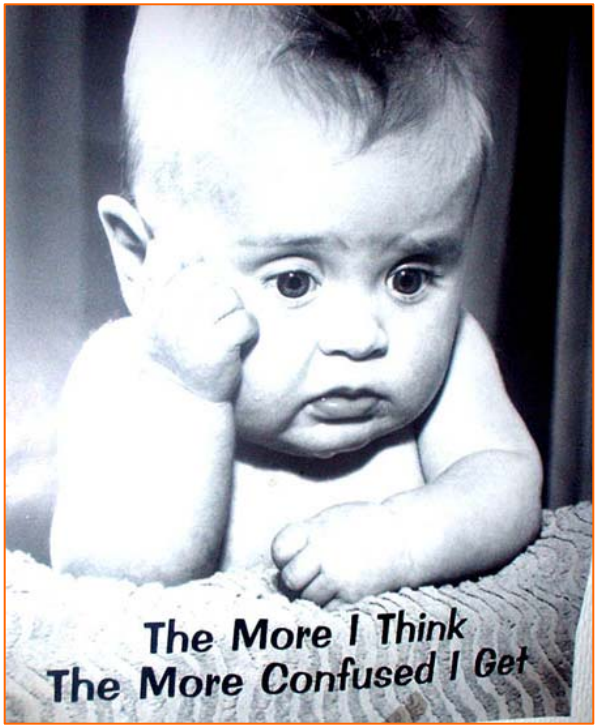
http://www.cdc.gov/about/grand-rounds

Access

Available on IPTV : http://intra-apps.cdc.gov/itso/iptv/iptvschedule.asp
IPTV link also available on Grand Rounds **intranet** site:
http://intranet.cdc.gov/od/odweb/about/directorGrandRounds.htm

For those outside of CDC, a broadband link is available at:
http://www.cdc.gov/about/grand-rounds (Grand Rounds **internet** site)

Continuing Education Credits



Starting in January 2010

Credit Hours will be available for:

- **Physicians (CME)**
- **Non-Physicians (CME)**
- **Nurses (CNE)**
- **Certified Health Education Specialists (CECH)**
- **Veterinarians (AAVSB/RACE)**
- **Pharmacist (CPE)**
- **Other Professionals (CEU)**

Knowledge to Action Science Clips

CDC *Knowledge to Action Science Clips: December 7 - December 11, 2009*

Vol. 1, Issue: 18

Previous Issues: Vol. 1, Issue 1, Issue 2, Issue 3, Issue 4, Issue 5, Issue 6, Issue 7, Issue 8, Issue 9, Issue 10, Issue 11, Issue 12, Issue 13, Issue 14, Issue 15, Issue 16, Issue 17

Welcome to Knowledge to Action Science Clips, CDC's new weekly digest!

Each Tuesday, to enhance awareness of emerging scientific knowledge, selected science clips will be posted here for the public health community. The focus is applied public health research and prevention science that has the capacity to improve health now. Visit weekly for the latest in:

The report consists of three components:

- CDC-authored publications
- Key scientific articles in featured topic areas *(this week featuring Communicable Diseases - 2009 pandemic influenza A (H1N1), Food Safety, and Healthcare Associated Infections)*
- Public health articles noted in the media

Selection of food safety articles:
Jeff Jones (NCZVED)
Aron Hall (NCIRD)

Food Safety

60. Effectiveness of liquid soap and hand sanitizer against norwalk virus on contaminated hands
Liu P, Yuen Y, Hsiao HM, Jaykus LA, Moe C.
Appl Environ Microbiol. 2009 Nov 20.
[+]Show Abstract

61. Spinacia oleracea L. leaf stomata harboring cryptosporidium parvum oocysts: a potential threat for food safety
Macarisin D, Bauchan G, Fayer R.
Appl Environ Microbiol. 2009 Nov 20.
[+]Show Abstract

62. Effects of technological processes on the tenacity and inactivation of norovirus GGII in experimentally contaminated foods
Mormann S, Dabisch M, Becker B.
Appl Environ Microbiol. 2009 Nov 20.
[+]Show Abstract

63. Attachment and internalization of murine norovirus-1 in manure and biosolids to romaine lettuce
Wei J, Jin Y, Sims T, Kniel KE.
Appl Environ Microbiol. 2009 Nov 20.
[+]Show Abstract

64. 4-bromophenacyl bromide specifically inhibits rhoptry secretion during toxoplasma invasion
Ravindran S, Lodoen MB, Verhelst SH, Bogyo M, Boothroyd JC.
PLoS One. 2009 ;4(12):e8143.
[+]Show Abstract

http://intranet.cdc.gov/scienceclips

We Welcome Any Feedback!

The Public Health Grand Rounds email address:
grandrounds@cdc.gov

For information about the Grand Rounds or to suggest future topics, please contact Dr. Tanja Popovic at tpopovic@cdc.gov.

If you have specific questions about the broadband link and other connectivity issues, or if interested in receiving future CDC Public Health Grand Rounds announcements, please contact Mr. Shane Joiner at sjoiner@cdc.gov.

Stay Tuned

Jan 2010

- ✓ Polio Vaccination Effectiveness in India – Implications for Polio Eradication

Feb – May 2010

- ❑ Chlamydia Prevention and Control
- ❑ Neural Tube Defects and Folic Acid Fortification
- ❑ Preventing Health Effects from Nanotechnology
- ❑ Radiological and Nuclear Preparedness

Foodborne Diseases: Better Prevention with Better Public Health Information

Division of Foodborne, Bacterial and Mycotic Diseases
National Center for Zoonotic, Vector-Borne and Enteric Diseases
NCZVED

Outline

- **Robert V. Tauxe, MD, MPH,** NCZVED
  - *Foodborne Diseases and Their Prevention*
- **Stephen M. Ostroff, MD, MPH**
  Pennsylvania Department of Health
  - *State Health Department Perspective*
- **Michael P. Doyle, PhD,** University of Georgia
  - *A Perspective on the Food Industry*

FOODBORNE DISEASES AND THEIR PREVENTION

Robert V. Tauxe, MD, MPH

Acting Senior Advisor for Surveillance and Epidemiology

National Center for Zoonotic, Vector-Borne and Enteric Diseases

FOODBORNE DISEASES AND THEIR PREVENTION

- **The Scope of the Problem**
- **Prevention Can Be Improved: Scientific Evidence and Lessons Learned**
- **Strategies for Improving Prevention with Better Public Health Information**

Health Burden of Foodborne Diseases in the United States

Annual Estimates

- Estimated 76 million illnesses, 323,000 hospitalizations, 5,000 deaths (1999)
- Most illness appears to be sporadic
- 1,300 foodborne outbreaks reported
- Most severe disease is in the very young, the elderly, and the immunocompromised
- ~Health-related costs of 7 major infections: $9 - $48 billion (2008 $)

Mead, EID 1999
Buzby and Roberts, Food Review 1997

Challenge: Many Different Pathogens and Toxins

- More than 250 pathogens and toxins transmitted by food
- More pathogens continue to be identified
- Many pathogens also spread through water, direct animal or human contact
- The 6 most important pathogens are

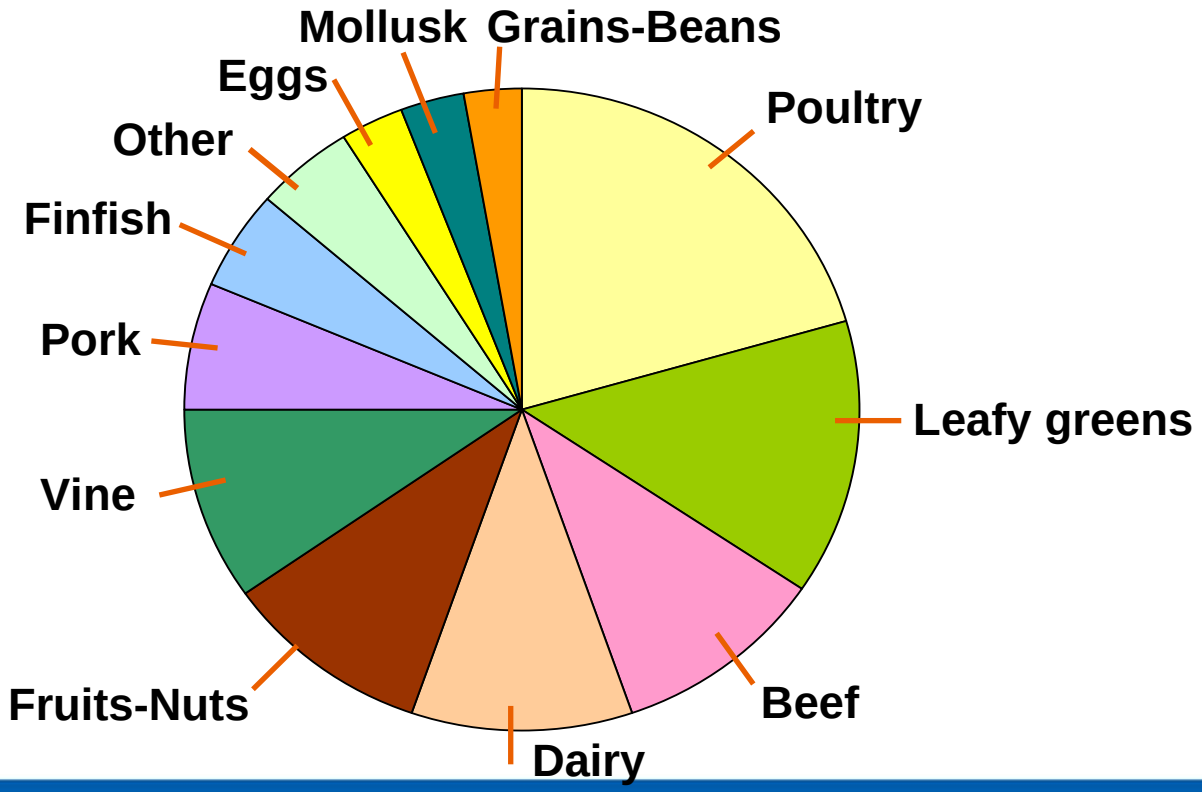
Estimates of Annual Food-Related		
	Illnesses	Deaths
Listeria	2,500	500
E. coli O157:H7 *et alia**	93,000	75
Toxoplasma	1,125,000	275
Salmonella	1,350,000	550
Campylobacter	1,900,000	100
Norovirus	9,200,000	124

Mead, EID 1999

*And other Shiga toxin-producing *E. coli*

Challenge: A Broad Range of Foods Can Be Contaminated

- Prevention often focuses on specific foods
- 2003-2007: Illnesses in 1,355 outbreaks caused by single food



Challenge: A Broad Range of Foods Can Be Contaminated (cont.)

10 new food vehicles identified in multistate outbreaks since 2006

- Bagged spinach
- Carrot juice
- Peanut butter
- Broccoli powder on a snack food
- Dog food
- Pot pies
- Canned chili sauce
- Hot peppers
- White pepper
- Raw cookie dough

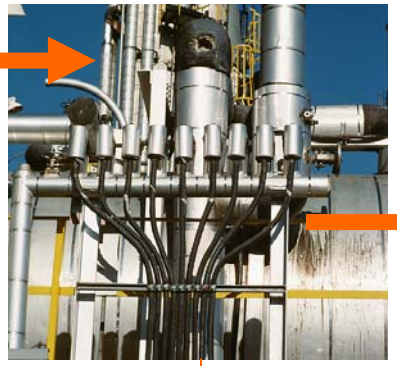
Challenge: Major Trends Affecting Food Safety

- **Centralization of food processing**
  - The 4 largest slaughter companies control 56% of broilers and 84% of beef
- **Growing public appetite for fresh, unprocessed foods**
  - Fresh produce availability increased by 28% from 1970 to 2007
  - Raw milk sales permitted in 25 states
- **Globalization of food sources**
  - 11% imported in 1990; 15% in 2005

Hendrickson and Heffernan 2007. http://www.nfu.org/wp-content/2007-heffernanreport.pdf
USDA/ERS: Food availability. http://www.ers.usda.gov/Data/FoodConsumption/FoodAvailQueriable.aspx
Jerardo 2008, Amber Waves, Vol 6: Issue 1, pp 36-38.

Challenge: Many Partners and Stakeholders

On-farm good agricultural practices



Good manufacturing practices & inspection
Designing processes for safety
Microbial monitoring

Restaurant/store codes & inspection

Consumer education

Challenge: Many Partners and Stakeholders
(cont.)

- Disease surveillance
- Outbreak investigation

- Local health departments
- State health departments
- CDC
- Regulatory agencies

Challenge: Many Partners and Stakeholders
(cont.)

LIMIT ONGOING DISEASE TRANSMISSION

&

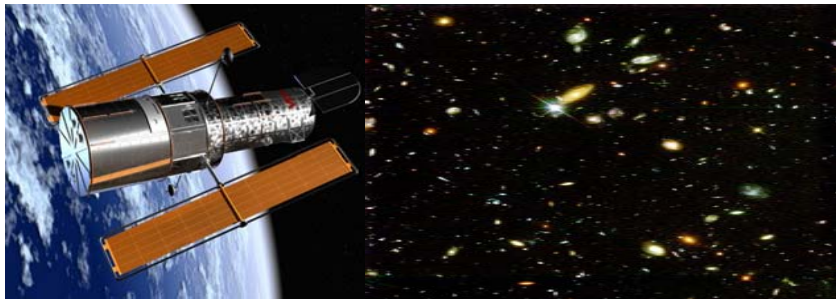
ADDRESS UNDERLYING PROBLEMS & PREVENT FUTURE EVENTS

FOODBORNE DISEASES AND THEIR PREVENTION

- **The Scope of the Problem**
- Prevention **Can Be Improved: Scientific Evidence and Lessons Learned**
- **Way Forward: Strategies for Improving Prevention with Better Public Health Information**

PulseNet and Molecular Subtyping:
the Hubble Telescope of Foodborne Disease Prevention

In 1995, Deep Field Survey by the Hubble Space Telescope found large numbers of distant galaxies and star clusters, never seen before, and transformed the notion of deep space.

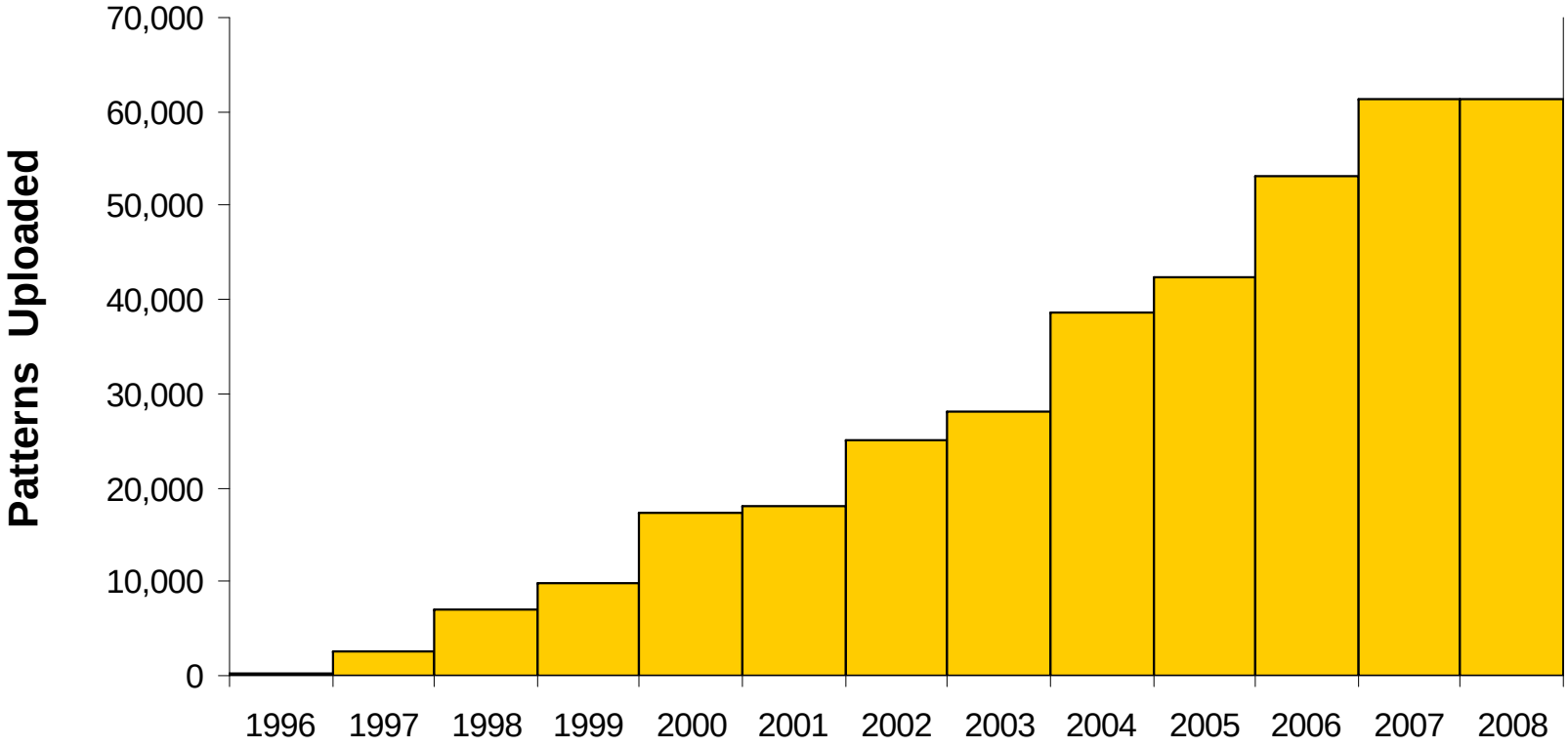


In 1996, surveillance for foodborne disease was similarly changed by the launch of the molecular fingerprinting network, PulseNet

- A national network of public health and food regulatory agency laboratories
- Coordinated by CDC; members are state health departments, local health departments, and federal agencies (CDC, USDA/FSIS, FDA)

http://www.cdc.gov/pulsenet

Patterns Uploaded to PulseNet by Year, 1996-2008



Molecular Subtype-Based Surveillance

- **A routine part of surveillance for some pathogens**
- **1996: Implemented in 1 state; 67% increase in number of detected *E. coli* O157 outbreaks**
- **2001: Implemented in all states**
- **Cost-effective: Cost in 1 state covered by preventing 5 *E. coli* O157 infections**
- **Each year PulseNet identifies**
  - ~1,500 clusters at local/state level; ~250 multi-state clusters
  - ~10-15 dispersed multistate outbreaks/year – "new scenario"
  - Most would not have been identified previously

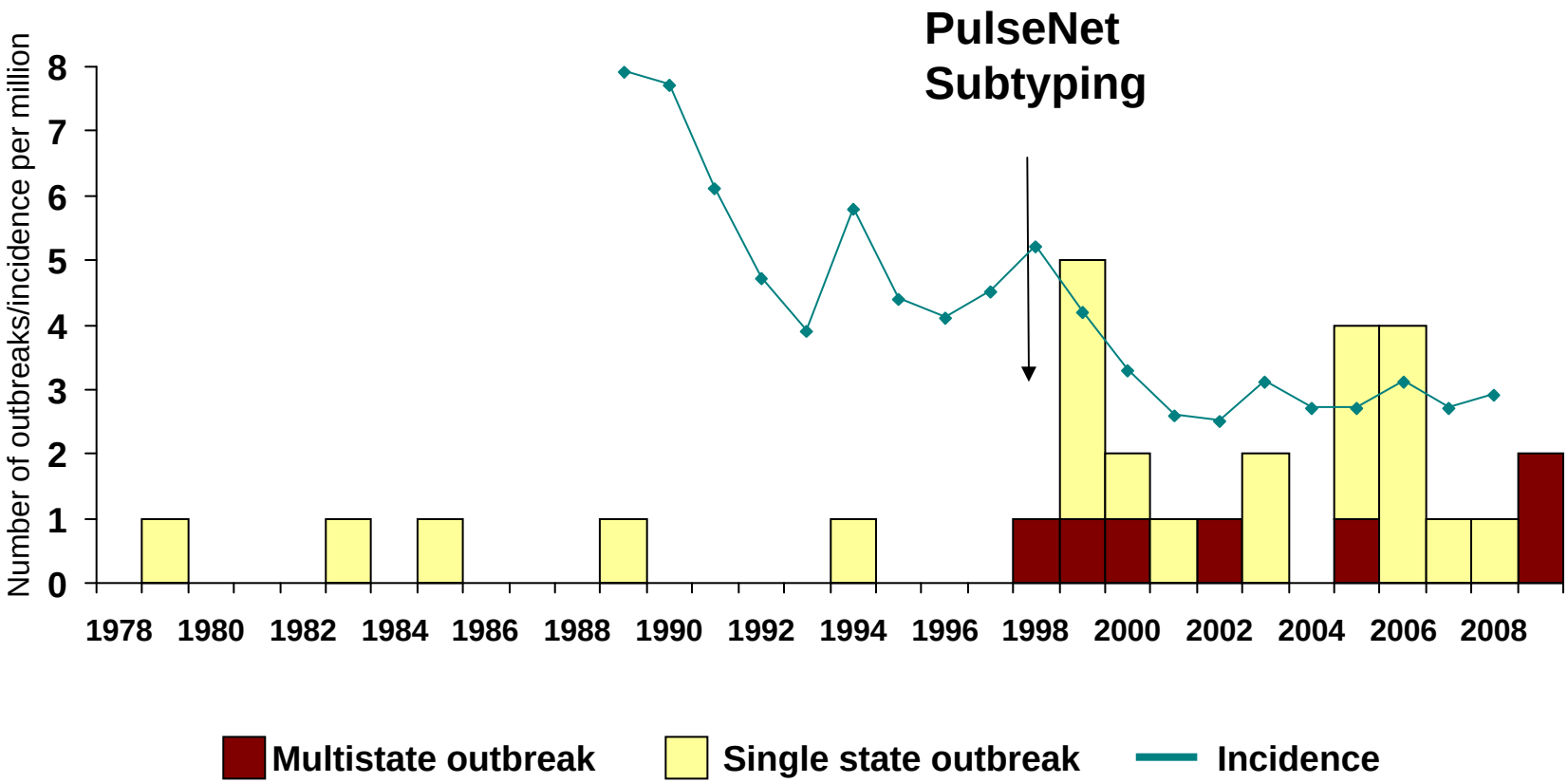
Bender, NEJM 1998
el-Basha, EID 2000

Molecular Subtype-Based Surveillance
"New Scenario" Outbreaks

- **Investigating "new scenario" outbreaks**
  - System failure contaminating a widely distributed food
  - Can identify unsuspected problems in production/processing
  - Stimulate better practices and new regulations
- **2002: Listeriosis outbreak affected 54, with 13 deaths**
  - Detected in 9 states with PulseNet
  - Pre-cooked deli turkey meat
  - 30 million pounds of turkey were recalled
  - Industry introduced a new process after packaging
  - FSIS launched new regulatory requirements for in-plant monitoring

Gottlieb, CID 2005

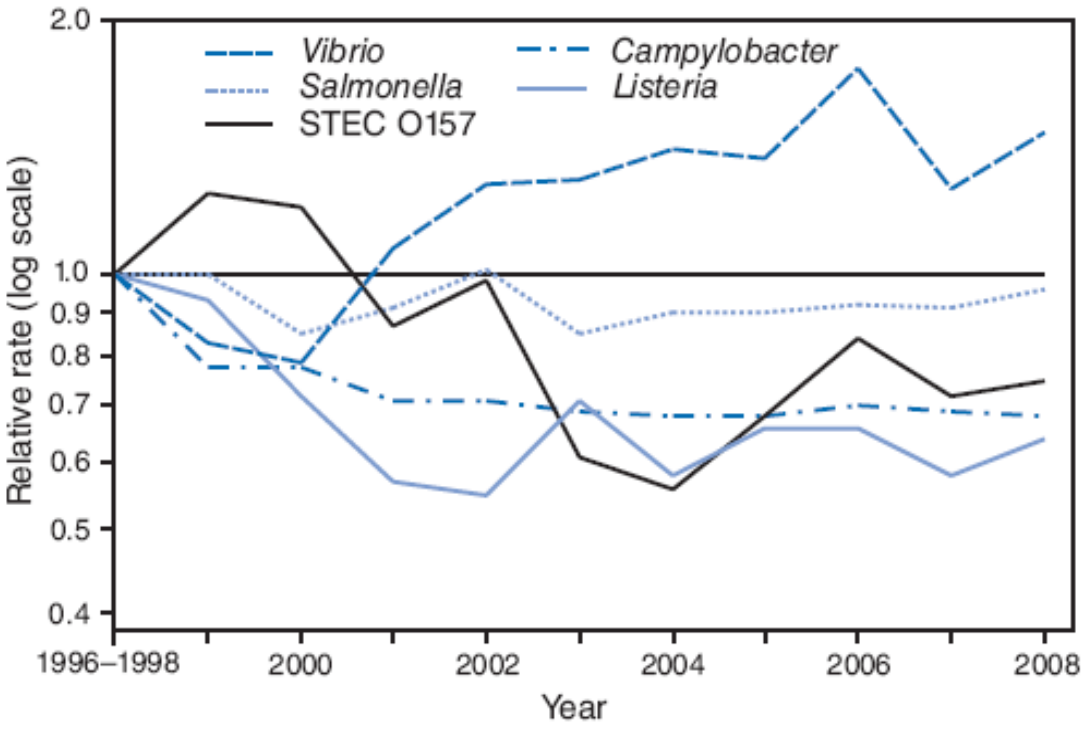
Outbreaks and Incidence of Reported Cases of Listeriosis, 1978-2008, United States



Incidence data from active surveillance systems (FoodNet since 1996)
Outbreaks of confirmed *Listeria monocytogenes* reported to CDC (eFORS)

Trends in Foodborne Diseases, FoodNet, 1996-2008

FIGURE 2. Relative rates of laboratory-confirmed infections with *Vibrio*, *Salmonella*, STEC* O157, *Campylobacter*, and *Listeria* compared with 1996–1998 rates, by year — Foodborne Diseases Active Surveillance Network, United States, 1996–2008†



* 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 can differ. Data for 2008 are preliminary.

Since 1996-1998

Significant decrease:

- ***E. coli* O157 - 25%**
- ***Campylobacter* - 32%**
- ***Listeria* - 36%**

No significant change:

- ***Salmonella***

Significant increase:

- ***Vibrio* + 47%**

Progress halted:
No significant change in the last 4 years

MMWR 2009; 58:333-337

More Prevention Is Possible Soon

- On-farm measures for fresh produce and eggs
- Reducing contamination of ground beef, other meat, and poultry
- Treatments for raw shellfish
- Educating pregnant women
- Training restaurant managers in food safety

Successful Prevention: Scientific Evidence and Lessons Learned

- **Better surveillance and investigation can identify more gaps**
- **Investigations can lead to**
  - Immediate control, halting an outbreak
  - Long-term prevention by changing the system
- **Synergy with regulatory agencies and other partners**
  - Depend on CDC for information to guide action
- **Local, state, and national events are interconnected**
  - An event in 1 location can have state and/or national implications
  - Local and state capacity is critical
  - Public health networks, like PulseNet, empower the whole system

FOODBORNE DISEASES AND THEIR PREVENTION

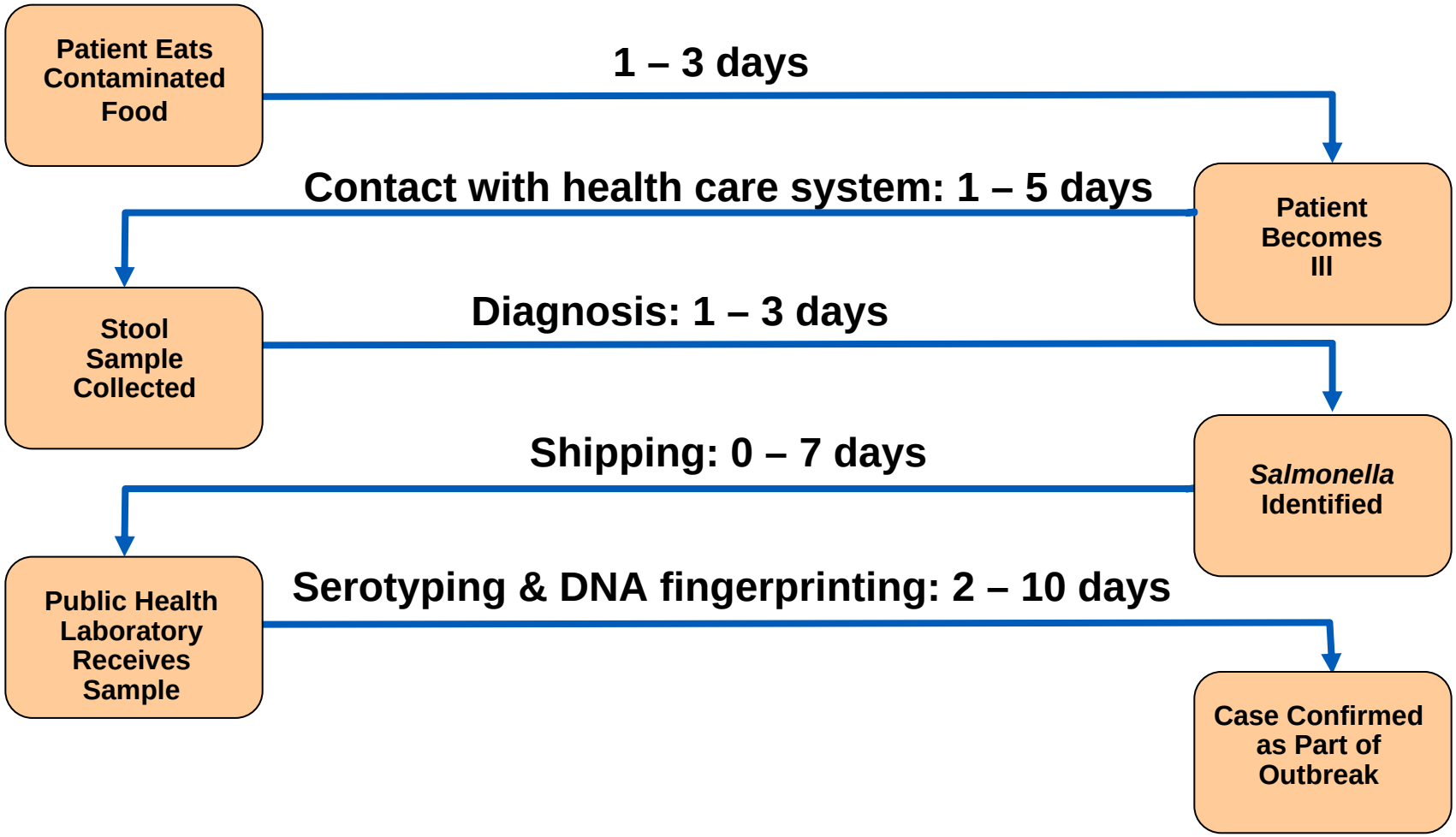
- **The Scope of the Problem**
- **Prevention Can Be Improved: Scientific Evidence and Lessons Learned**
- **Way Forward: Strategies for Improving Prevention with Better Public Health Information**

The Way Forward: Strategies for Improving Prevention with Better Public Health Information

- Improving public health surveillance for foodborne infections
- Improving foodborne outbreak investigation and coordination
- Translating lessons learned to drive policy and inform regulatory and industry changes

The Surveillance Process

Reporting Cases Takes Time

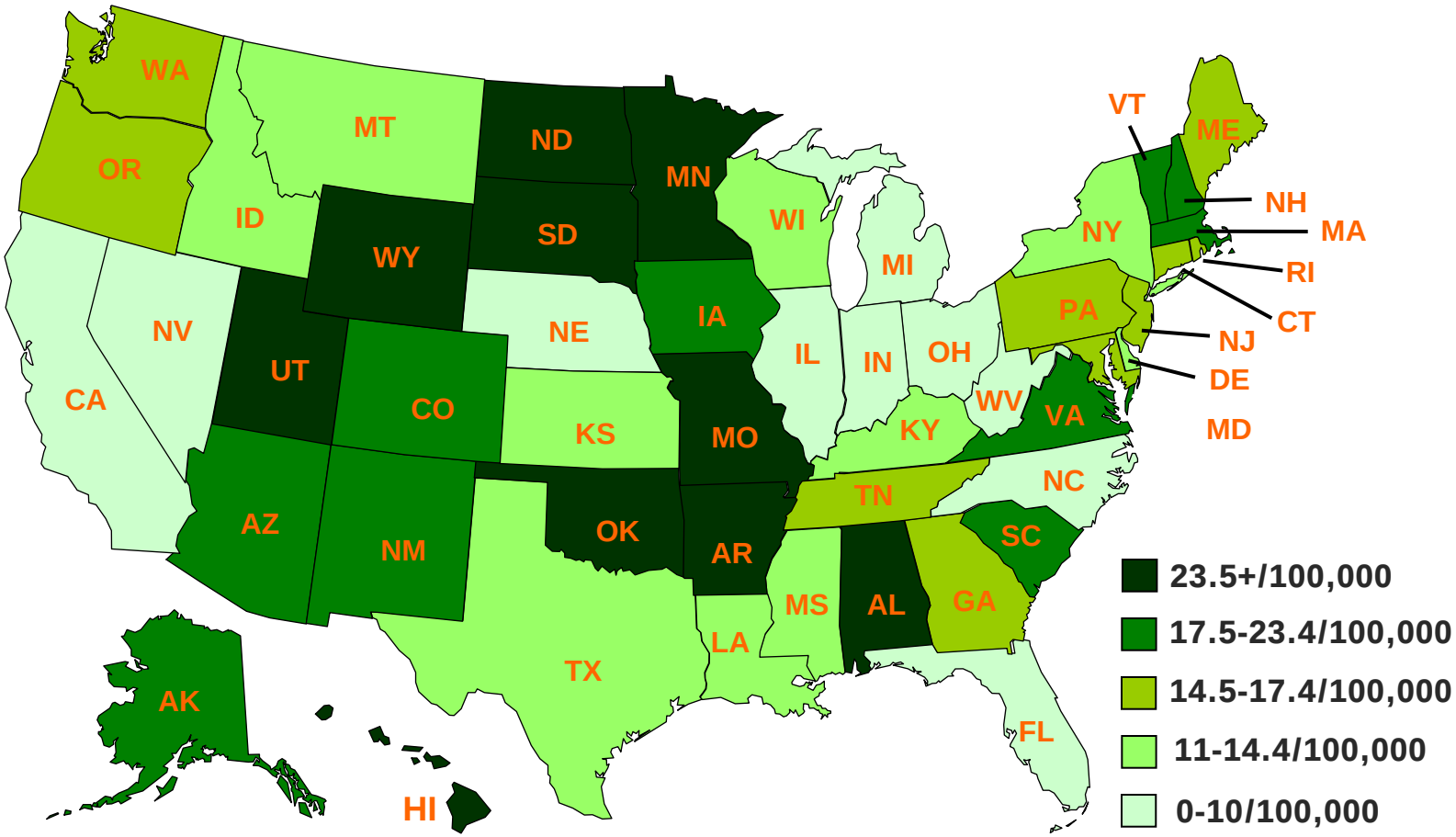


Improving Surveillance for Foodborne Infections: The Challenge

- **Routine surveillance is incomplete, slow, and variable**
  - Molecular subtyping
    - Only 63% of states require referral of *Salmonella* isolates to the public health laboratory
    - 77% of those referred are subtyped in PulseNet
    - 18 days from onset of illness to posting to PulseNet
  - Case interview
    - 63% routinely interview with a standard state questionnaire
    - Of those, 42% collect a comprehensive food history (content varies by state)
    - 14 days after onset of illness until first interview

Hedberg, EID 2008
Keene and Kanwat, 3rd Annual Meeting for OutbreakNet, 2007
CSTE survey, 2002
APHL surveys, 2007, 2009

Annual PulseNet Upload Rates Per 100,000 Population, by State, 2004-2008



Improving Public Health Surveillance for Foodborne Infections: Short-Term

- **Create network for methods assessment (OutbreakNet Sentinel Sites)**
  - 3 pilot sites this year, (UT, WI, NYC)
  - Assessing case interview methods
- **Strengthen and build on successful model of PulseNet**
  - Subtype more pathogens in public health laboratories
- **Share lessons learned in annual meeting**
- **Provide laboratory and epidemiology training**
- **Build global capacity with WHO**

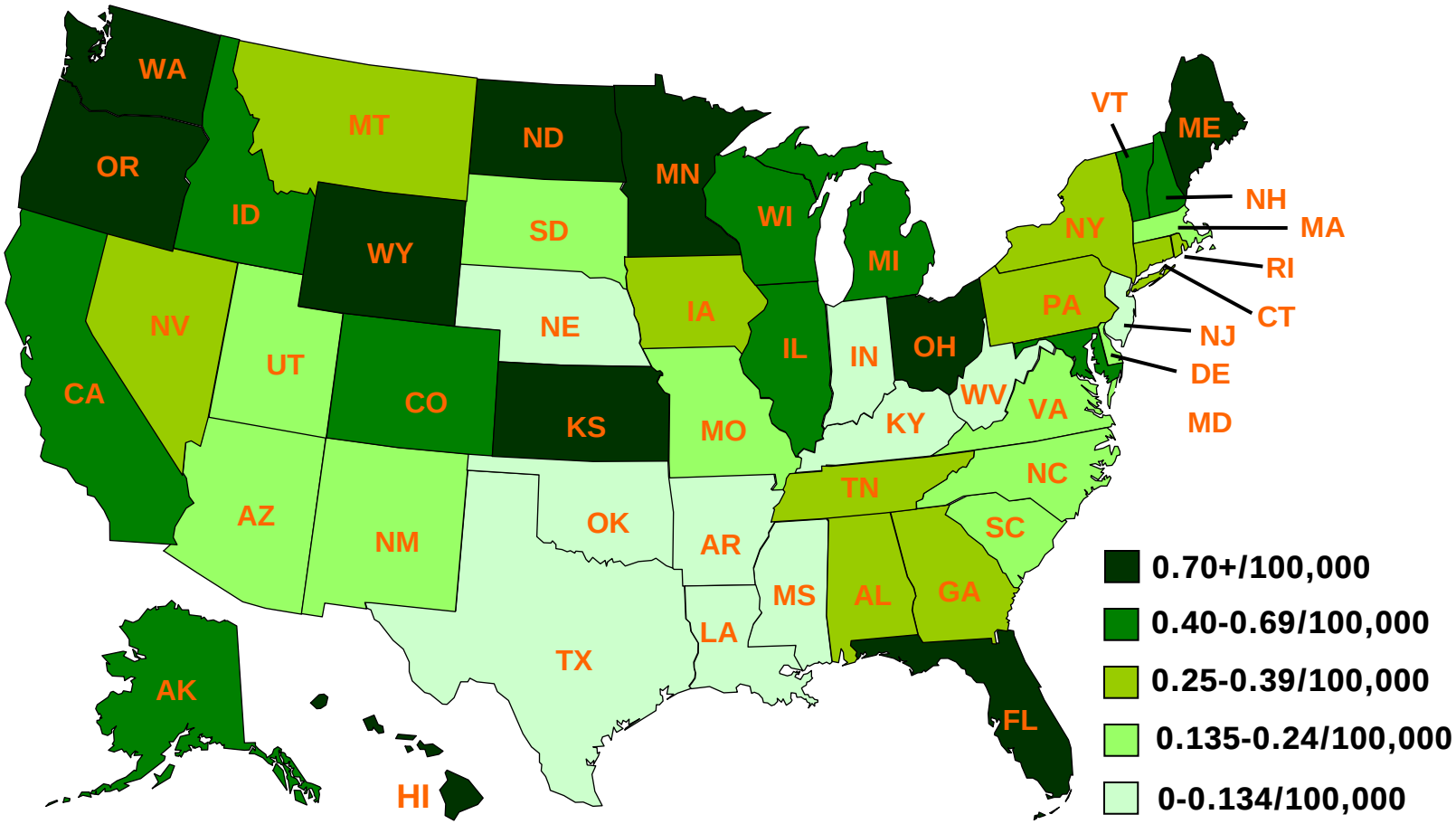
Improving Public Health Surveillance for Foodborne Infections: Longer-Term

- **Expand OutbreakNet Sentinel Sites**
  - Refine faster standardized approaches to surveillance
  - Assess faster laboratory processes to speed up subtyping
  - Measure costs and impact
- **Implement best practices and methods in many states and large local health departments**
  - Example: telediagnosis for parasitic infections can reduce time from 48 hours to 30 minutes and costs by 80%
- **Combine information from monitoring food and animals**
- **Make surveillance more global**

Improving Foodborne Outbreak Investigation and Coordination: Challenges

- **Outbreak investigations are often limited**
  - For outbreaks reported in 2006, 32% had no determined etiology and 58% had no specific food identified
- **Multistate outbreaks demand faster, better, and more standardized approaches to**
  - Triage clusters - prioritize among hundreds detected
  - Generate and test hypotheses
  - Collect, combine, and share multistate data
- **Integrating product traceback and environmental assessment into investigations**
- **Rapid data sharing and communication protocols**

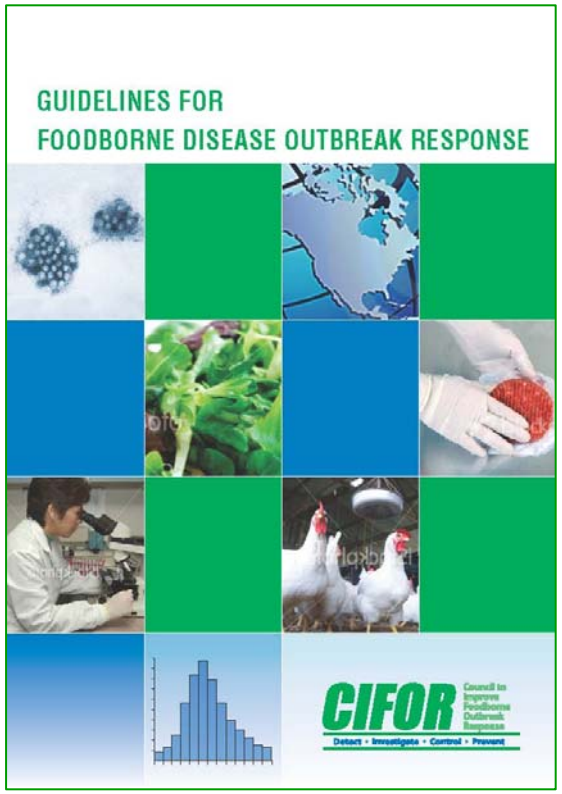
Foodborne Outbreaks Reported Annually Per 100,000 Population, by State, 2003-2007



CDC, National Foodborne Outbreak Reporting System

Improving Foodborne Outbreak Investigation and Coordination: Short -Term

- **Improve methods and build capacity**
- **Implement 2009 Guidelines by CIFOR (a multiagency group)**
- **OutbreakNet Sentinel Sites can evaluate methods to**
  - Conduct rapid and coordinated investigation
  - Optimize laboratory processes
  - Integrate environmental health
  - Refine templates for communication
- **Engage regulatory partners early in investigations**



Improving Foodborne Outbreak Investigation and Coordination: Longer-Term

- **Improved methods are used more widely**
- **OutbreakNet Sentinel Sites expand to more diverse settings**
- **Document effectiveness in**
  - Reducing time to subtype pathogens and interview ill persons in detail
  - Increasing proportion of outbreaks with defined etiology and specific food source
  - Identifying new food vehicles or intervention points on which prevention can be focused
- **Collaborate with other countries**

Translating Lessons Learned to Drive Policy and Inform Regulatory and Industry Changes

- **Improving the knowledge base for**
  - Burden of illness (including chronic sequelae)
  - Trends (including population subgroups)
  - Attribution of illness to particular foods, reservoirs, and venues
- **Enhancing the dialogue with partners**
  - Online surveillance data and searchable databases
  - After outbreaks: Joint assessment of procedures, findings, and implications
  - Focus research on new issues identified

Foodborne Disease Prevention

- **Further reductions are possible**
  - **Stronger public health infrastructure**
  - **Regulatory changes at FDA and USDA/FSIS**
  - **Industry recognizes role**
- **Anticipate the unexpected**
- **Learn more from affected persons**

VIDEO WILL BE INSERTED

PUBLIC HEALTH PARTNERSHIPS TO PREVENT FOODBORNE ILLNESS

Michael R. Taylor
Senior Advisor to the Commissioner
Food and Drug Administration

STATE HEALTH DEPARTMENT PERSPECTIVE

Stephen M. Ostroff, MD, MPH
Director, Bureau of Epidemiology
Pennsylvania Department of Health

Importance of Food Safety in Pennsylvania

- Agriculture is the #1 industry in Pennsylvania
- Major food processing and production

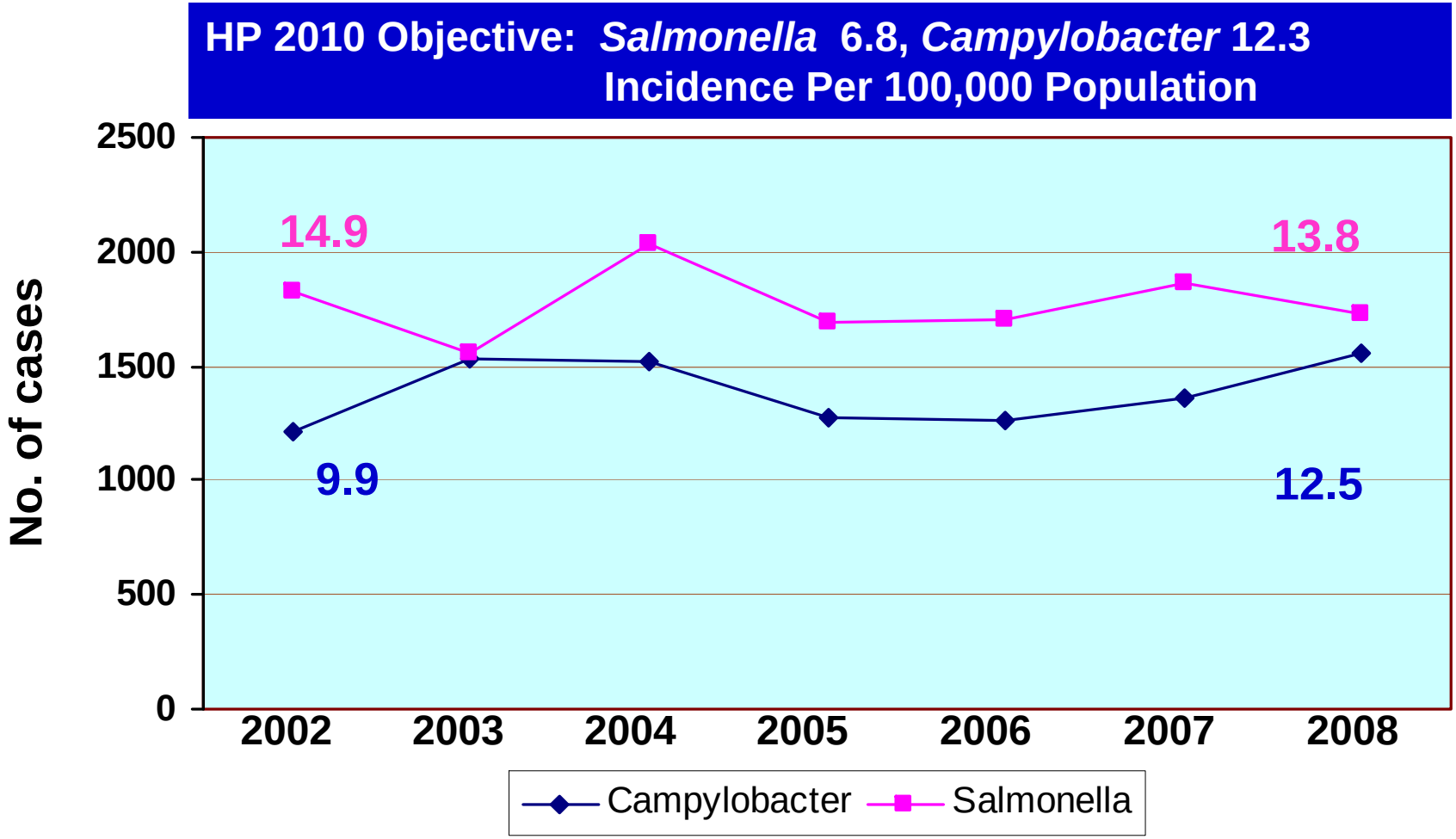
  (e.g., Hershey, Heinz)
- Legacy of *Salmonella* Enteritidis and egg industry
- Substantial public concern around food safety and foodborne disease
- Foodborne outbreaks are the most commonly reported outbreak type

Recent Pennsylvania-Centric Foodborne Outbreaks

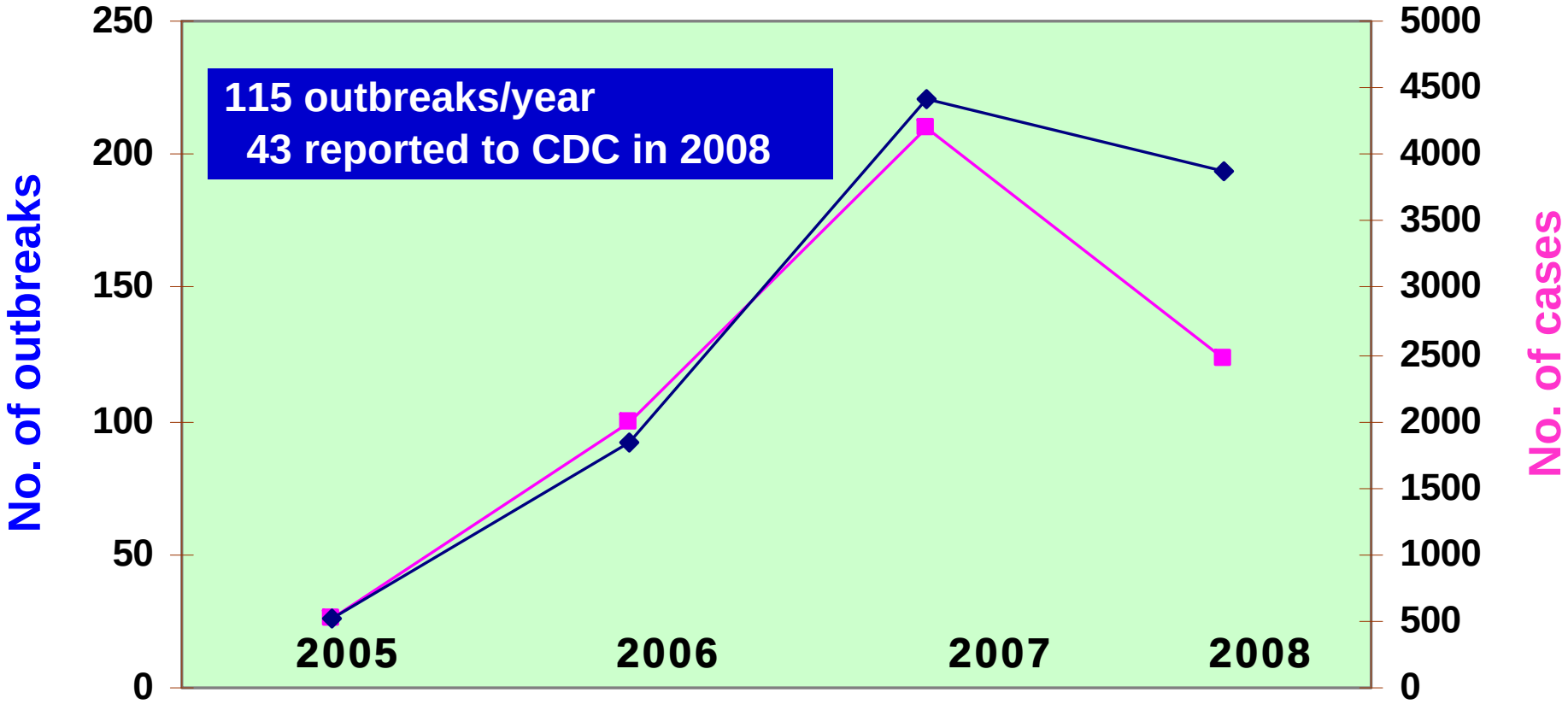
❑ **Hepatitis A**	**Green onions 2003**
❑ ***Salmonella***	**Convenience store tomatoes 2004***
❑ ***E. coli* O157**	**Mexican-style fast food shredded lettuce 2006***
❑ ***E. coli* O157**	**Pre-packed spinach 2006***
❑ ***Salmonella***	**Dry dog food 2007***
❑ ***Salmonella***	**Raw milk 2007**
❑ ***Campylobacter***	**Raw milk 2007 and 2008**

***Multistate**

Laboratory-Confirmed Case Reports Pennsylvania, 2002-2008



Gastrointestinal Outbreaks Pennsylvania 2005-2008



Gastrointestinal Outbreaks Pennsylvania 2005-2008

Pathogen	Number of Outbreaks	Number of Cases	Cases/ Outbreak
Salmonella	226	649	2.9
Campylobacter	**29**	**210**	**7.2**
***E. Coli* O157**	**14**	**139**	**10.0**
Norovirus	**219**	**7516**	**34.3**

Foodborne Diseases in Pennsylvania: Challenges

- **Number of cases and clusters**
  - At any time, 5-15 PFGE “clusters” active
  - Insufficient capacity to investigate them all
  - How to prioritize which clusters get investigated?
- **National multistate investigations**
- **Staff/Expertise**
  - Foodborne epidemiologists at State level: 0
  - Foodborne epidemiologists at local level: 0
  - State laboratorians: 1.5 FTE

Capacity of State and Territorial Health Agencies To Prevent Foodborne Illness

Richard E. Hoffman,* Jesse Greenblatt,† Bela T. Matyas,‡ Donald J. Sharp,§ Emilio Esteban,¶ Knachelle Hodge,* and Arthur Liang§

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 11, No. 1, January 2005

The capacity of state and territorial health departments to investigate foodborne diseases was assessed by the Council of State and Territorial Epidemiologists from 2001 to 2002 with a self-administered, Web-based survey. Forty-eight health departments responded (47 states and 1 territory). The primary reason for not conducting more active case surveillance of enteric disease is lack of staff, while the primary reasons for not investigating foodborne disease outbreaks are limited staff and delayed notification of the outbreak. Sixty-four percent of respondents have the capacity to conduct analytic epidemiologic investigations. States receiving Emerging Infections Program (EIP) funding from the Centers for Disease Control and Prevention more often reported having a dedicated foodborne disease epidemiologist and the capability to perform analytic studies than non-EIP states. We conclude that by addressing shortages in the number of dedicated personnel and reducing delays in reporting, the capacity of state health departments to respond to foodborne disease can be improved.

the former NFSI funding and activities have been institutionalized as an ongoing food safety program. Continued progress on the part of regulators and industry to improve food safety are dependent on local, state, and federal agencies' ability to conduct epidemiologic and laboratory investigations that identify the offending agents and link them with specific foods.

Improvements in detecting and investigating foodborne illnesses were made during the 1990s when CDC implemented the Foodborne Diseases Active Surveillance Network (FoodNet), a component of the Emerging Infections Programs (EIP), and PulseNet (4,5). EIP is a network of epidemiology programs in state health departments that is funded and coordinated by CDC. It is intended to be a national resource for surveillance and epidemiologic research that goes beyond the routine public health department functions. Active, laboratory-based sur-

States Repeatedly Describe Limited Resources to Investigate Foodborne Diseases

www.cdc.gov/ncidod/EID/vol11no01/pdfs/04-0334.pdf

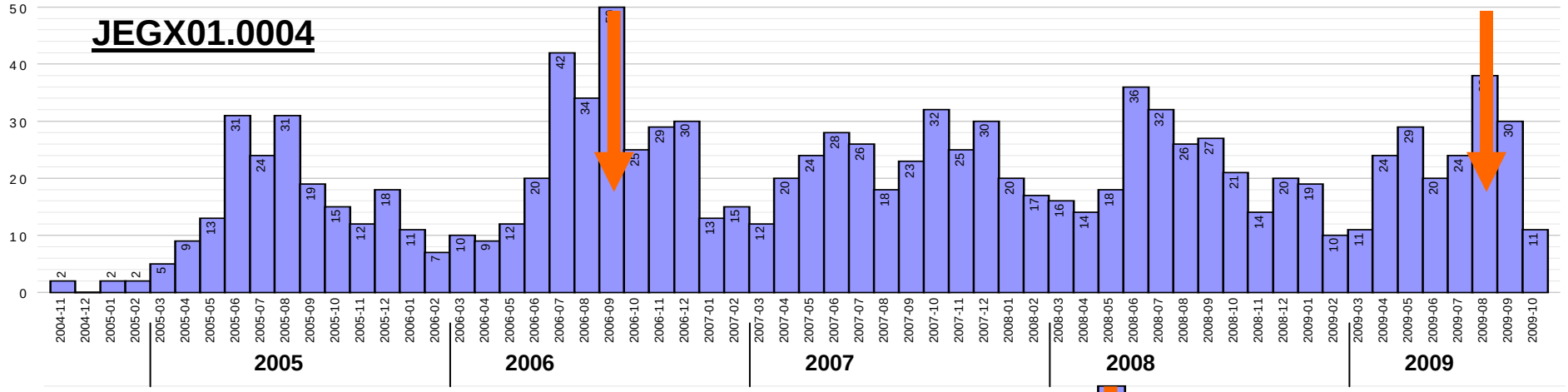
Barriers to Foodborne Disease Investigations in State and Territorial Health Departments

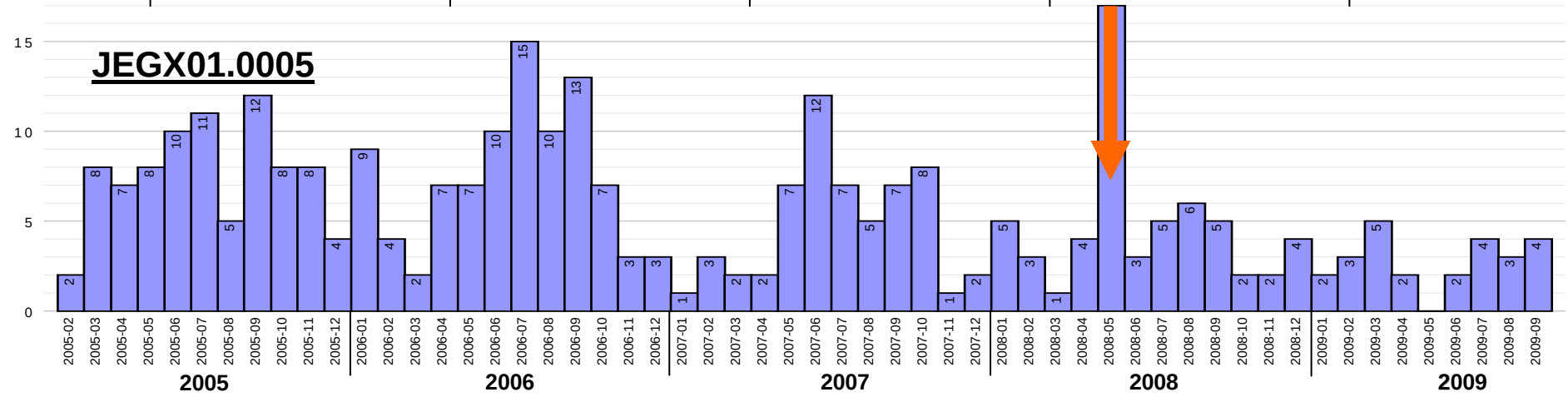
Of the outbreaks that are not investigated, which factors most limit your ability to investigate? (list all that apply)	% yes
Delayed notification	83
Limited staff	67
Lack of apparent importance	46
Laboratory capacity	21
Jurisdictional issue	19
Political consideration	13
Expertise	13

Hoffman et al, EID 2005

Frequency of Identification of Two *Salmonella* Enteritidis PFGE Patterns

Pennsylvania, 2005 – 2009

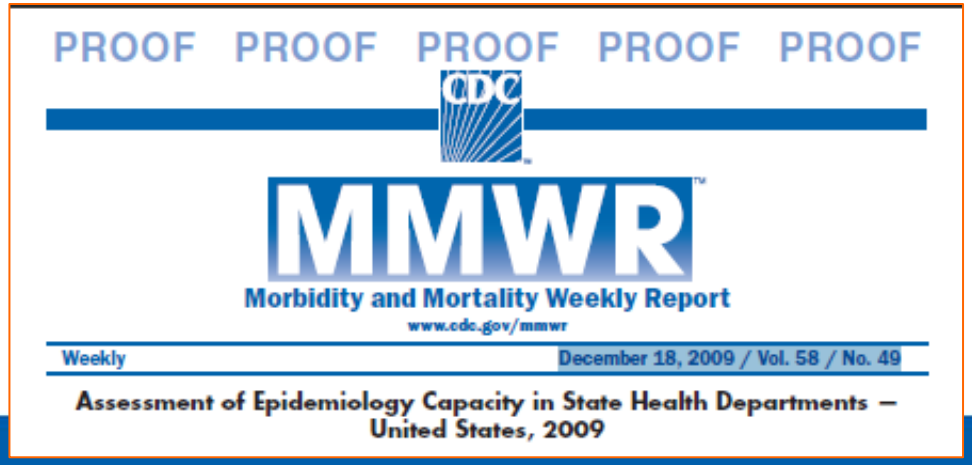




Preliminary data as of Oct 2009

Resource Limitations at State and Local Level

- **Surveillance**
  - 2002 – 27% of states insufficient staff to review surveillance data
- **Investigation**
  - 2002 – 30% of states lacked sufficient staff to investigate outbreaks
  - 2007 – 53% of states indicate local health departments unable to perform complex investigations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MMWR

Morbidity and Mortality Weekly Report

www.cdc.gov/mmwr

Weekly December 18, 2009 / Vol. 58 / No. 49

Assessment of Epidemiology Capacity in State Health Departments – United States, 2009

Resource Limitations at State and Local Level
(cont.)

- CSTE Epidemiologic Capacity Assessment (N = 51)

Year	Number of Epidemiologists	Change
2004	2498	-
2006	2436	- 62 (- 3%)
2009	2193	- 243 (-10%)

- State laboratories report 10% decrease 2004-2007 with major budget cuts since then

State Health Department Perspective

Concluding Thoughts

- Outbreak detection is improving
- State and local investigative capacity eroding

↓

- The result is missed opportunities to prevent foodborne diseases and promptly identify emerging trends
- There is clear need for dedicated personnel to conduct state and local foodborne disease surveillance, analysis, and investigation

A PERSPECTIVE ON THE FOOD INDUSTRY TO ENSURING SAFE FOODS

Michael P. Doyle, PhD
Director, Center for Food Safety
University of Georgia

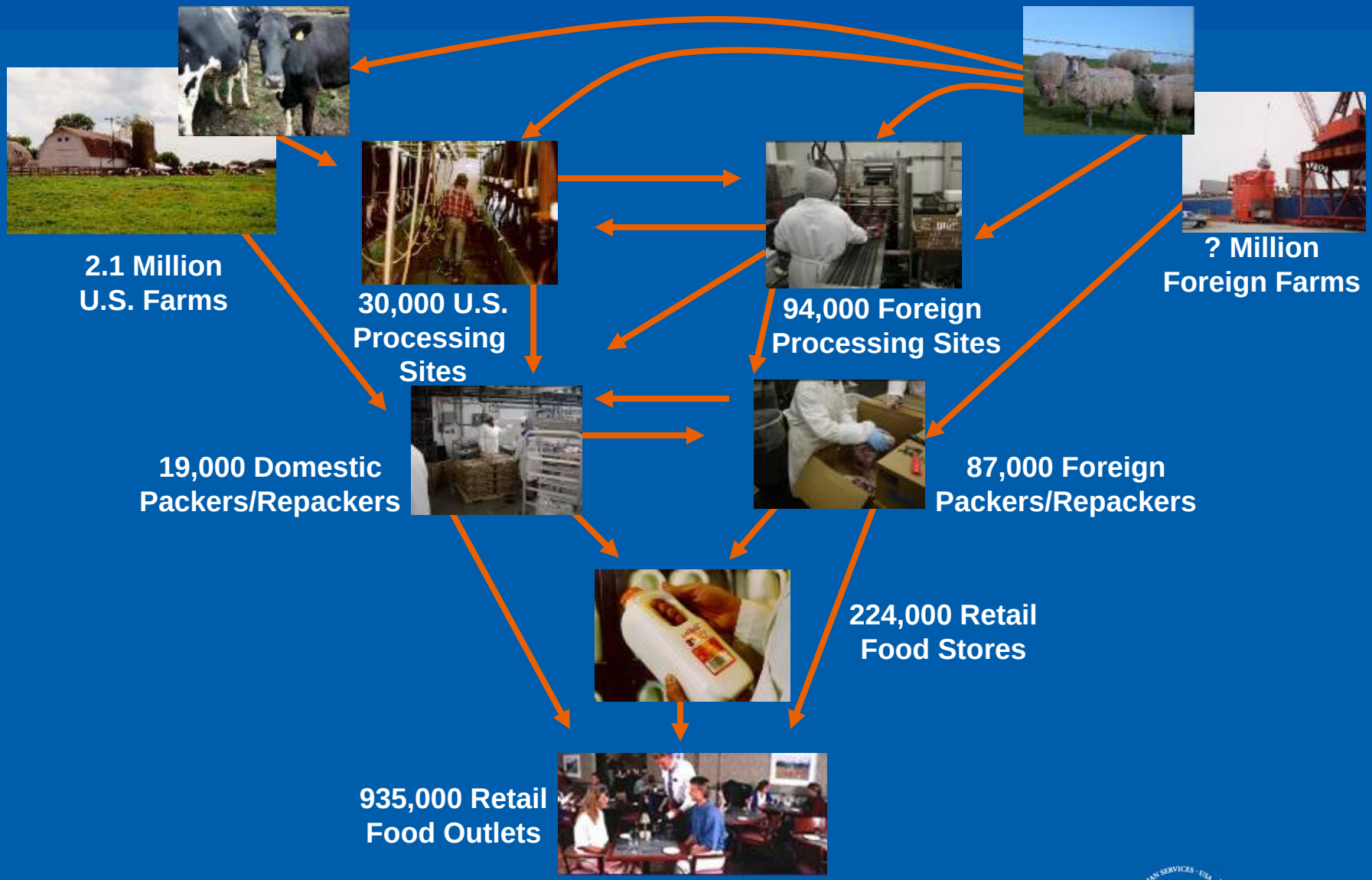
A PERSPECTIVE ON THE FOOD INDUSTRY TO ENSURING SAFE FOODS

- **Contributing factors to ensuring safe food production and processing**
- **Role of public health: Importance of foodborne disease surveillance for the food industry**
- **Imported foods: An impending food safety crisis?**

Contributing Factors to Ensuring Safe Food Production and Processing

- Structure of the U.S. food industry
- Federal food oversight and inspection
- Industry influences adversely affecting the safety of foods
- Public health

Structure of the United States Food Industry



Courtesy of Shawn Kennedy, National Center for Food Defense and Protection

Federal Food Oversight and Inspection

- **USDA/Food Safety and Inspection Service**
  - Oversight of ~ 20% of foods consumed in the United States (meat, poultry, and processed eggs)
  - In 2006, 7,500 food safety inspectors at ~ 6,000 plants
- **FDA**
  - Oversight of ~ 80% of foods consumed in the United States (everything that is not under the USDA purview)
  - In 2006, 640 full-time food safety inspectors for ~ 57,000 plants

Industry Influences Adversely Affecting the Safety of Foods

- **Not all food producers and food processors are equally committed to producing safe foods**
  - Largely depends on a company's culture, which is frequently determined by administrative leadership

    (CEO and senior management)
- **Primary driver is economics/low cost**
  - Major retailers are influential in cost cutting
  - Cost of ensuring safety of food is at risk
  - Major cost to manufacturing food is labor (~ 40%); developing countries have low labor costs

A PERSPECTIVE ON THE FOOD INDUSTRY TO ENSURING SAFE FOODS

- **Contributing factors to ensuring safe food production and processing**
- **Role of public health: Importance of foodborne disease surveillance for the food industry**
- **Imported foods: An impending food safety crisis?**

Role of Public Health

Foodborne disease surveillance and outbreak investigations have been the primary driver to prompting foodborne disease prevention by the industry by

- **Identifying new foodborne** pathogens
  - Example: *E. coli* O157 and hamburgers, 1982, 2 outbreaks, 43 cases
- **Identifying new risky** practices
  - Example: Chopped garlic-in-oil and botulism, 3 cases in NY, unrefrigerated product, research determined need to acidify
- **Identifying** foods **not previously recognized as high risk**
  - Examples: peanut butter, peanut paste, dried dog food, bagged fresh-cut spinach, bagged fresh-cut lettuce, cookie dough flour, imported pepper, and Chinese dried vegetable flavoring

Role of Public Health
(cont.)

Foodborne disease surveillance and outbreak investigations can further promote prevention efforts by the food industry by

- **Identifying "problem" suppliers and food processors**
- **Identifying high-risk ingredients and foods to place greater emphasis on contamination prevention**
- **Providing impetus to change company's perspective and commitment to ensuring the safety of foods**

"The foodborne disease surveillance system is to the food industry what radar is to automobile drivers – It is the "threat" of being caught that helps drive compliance with best safety practices."

A PERSPECTIVE ON THE FOOD INDUSTRY TO ENSURING SAFE FOODS

- **Contributing factors to ensuring safe food production and processing**
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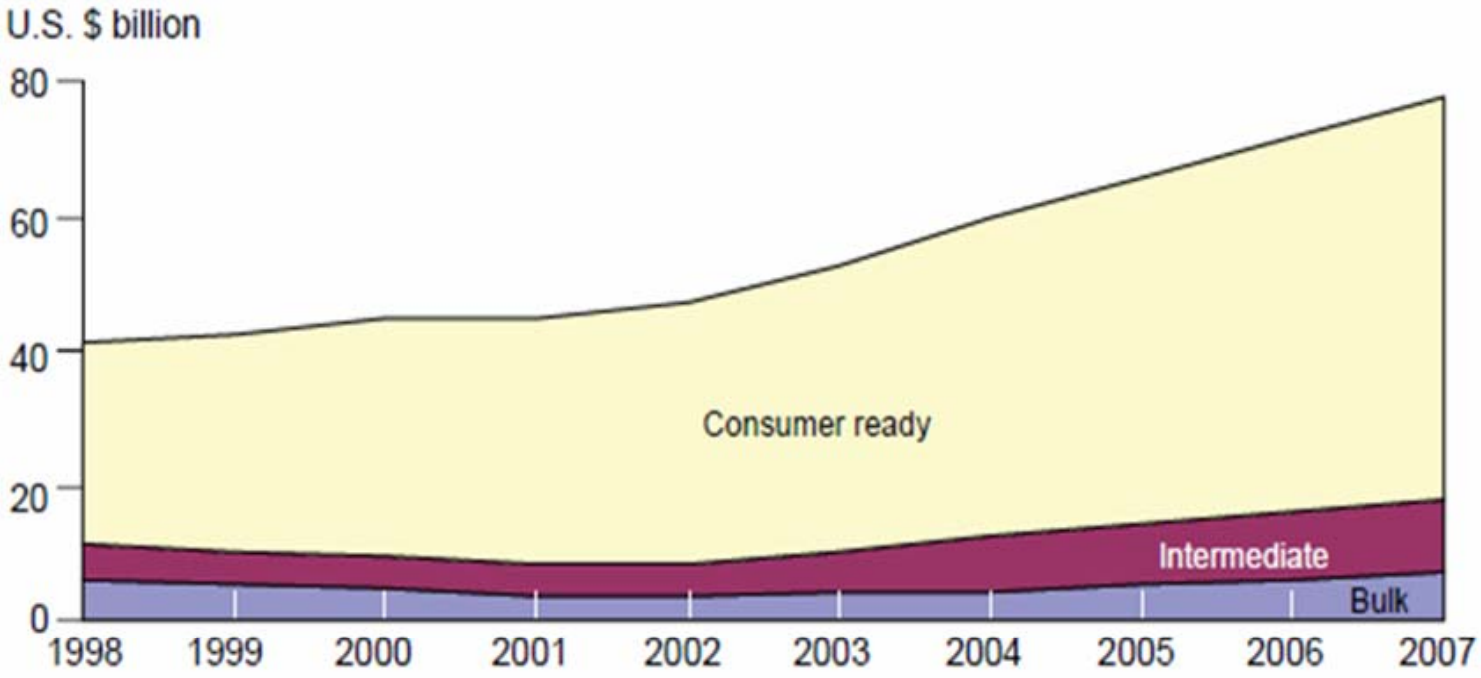
- Imported foods: **An impending food safety crisis?**

Imported Foods: An Impending Food Safety Crisis?

- Food imports to United States are increasing at an unprecedented rate: >15% of foods consumed in United States are imported
- Low cost is largely driving food industry to developing countries as sources of ingredients and consumer-ready foods
- Foods in many developing countries are not produced and prepared under acceptable sanitary practices
- Building adequate oversight to ensure safe imported foods is a major future challenge

United States Food Import Trends

United States food imports rose rapidly during fiscal years 1998-2007; consumer-ready products grew fastest



Compiled from data from the U.S. Department of Commerce, Census Bureau

Imported Foods: An Impending Food Safety Crisis?

Moving Processing to Other Countries to Save Labor Costs

- **Labor cost-saving is greater than shipping product across the Pacific twice**
- **Fruit cups**
  - Fruit canned in the United States
  - Shipped in large #10 cans to China or Thailand
  - Repacked into little plastic cups
  - Shipped back to the United States for sale as ready-to-eat

Examples of Pathogen or Toxin Contamination of Foods Imported into the United States

FDA Refusals, March 2008

Country of Origin	Product	Contaminant
China	Melon Seeds	Aflatoxin
China	Frozen Dried Croaker	*Salmonella*
Honduras	Soft Cheese	*Salmonella*
India	Cumin Seed	*Salmonella*
India	Sesame Seed	*Salmonella*
India	Black Pepper	*Salmonella*
India	Curry Powder	*Salmonella*
India	Frozen Raw Peeled Shrimp	*Salmonella*
Mexico	Marshmallow Sandwich Cookies	*Salmonella*
Mexico	Chocolate Nuggets	Aflatoxin
Mexico	Chili Powder	*Salmonella*
Vietnam	Roasted Melon Seeds	Aflatoxin

FDA Import Program (www.fda.gov/ora/import/ora_import_program.html)

Food Safety and the Food Industry
Concluding Thoughts

- Foodborne outbreak investigations are a major influence on a company's commitment to best practices
- There are many ways to make foods safer; targeted research can provide answers
- Regulation can help level the playing field
- Growing international sourcing of foods and pressures to reduce food costs means industry needs to upgrade prevention and oversight programs
- A strong foodborne disease surveillance and outbreak investigation system is essential to help ensure the safety of foods

PUBLIC HEALTH GRAND ROUNDS

Office of the Director

December 17, 2009