




PulseNet: The Molecular Subtyping Network for Foodborne Disease Surveillance



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What is PulseNet USA?

- ◆ Established in 1996, The Molecular Subtyping Network for Foodborne Disease Surveillance
- ◆ National network of state and local public health/food regulatory agency laboratories (USDA, FDA) coordinated by CDC
- ◆ Perform standardized molecular typing of foodborne disease-causing bacteria by Pulsed-field gel electrophoresis (PFGE)
- ◆ Dynamic database of DNA “fingerprints” at CDC
- ◆ Database available on-demand to participants



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PulseNet Objectives

- ◆ To detect clusters that may be widespread outbreaks
- ◆ Provide real-time molecular surveillance of the most important bacterial foodborne diseases
- ◆ Assist epidemiologists in investigating outbreaks
 - Separate outbreak-associated cases from other sporadic cases
 - Assist in rapidly identifying the source of outbreaks
- ◆ Act as a rapid and effective means of communication between public health laboratories

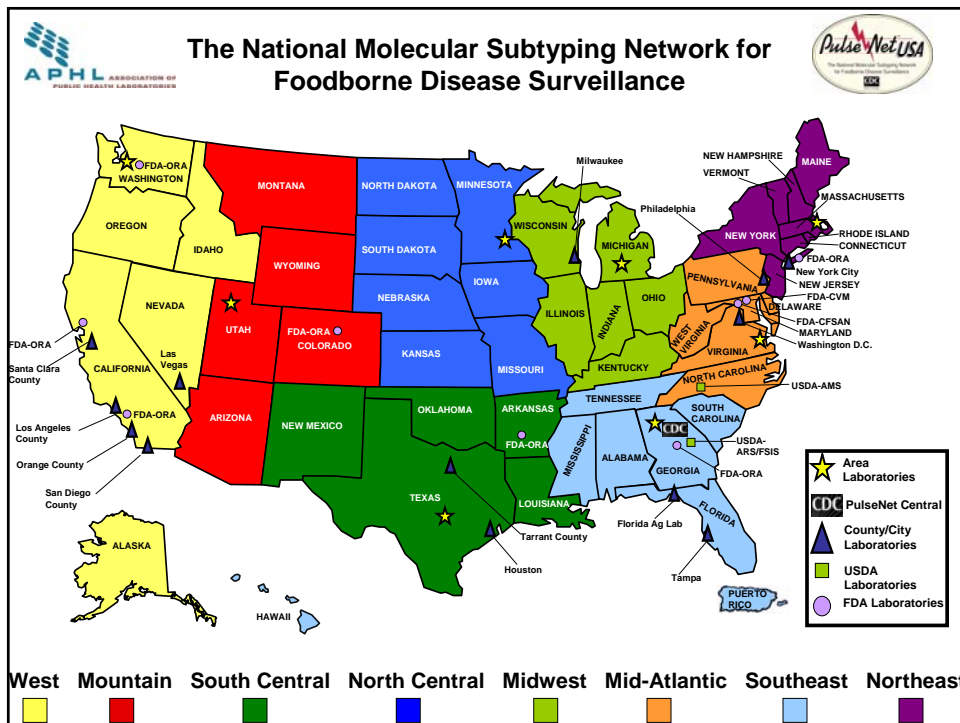
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Detecting Clusters

- ◆ Detecting a cluster of possibly related cases
- ◆ Linking "sporadic" cases to a known outbreak
- ◆ Linking two or more outbreaks together
- ◆ Matching strains from patients with strains from foods they ate
- ◆ Showing that the outbreak strain drops after control measures taken

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PulseNet Stakeholders

- ◆ **PulseNet Partners:**
 - CDC (database/lab teams)
 - USDA (FSIS, AMS, ARS, APHIS)
 - APHL
 - FDA (ORA, CFSAN, CVM)
 - 51 State/Territorial Health Depts
 - 15 Local Health Departments
 - 2 Agricultural Labs
 - International Partners (5 regions)
- ◆ **Other stakeholders:**
 - Foodborne epidemiologists
 - Academia
 - Physicians/Veterinarians
 - Food Industry
 - Other public health officials
 - Consumers groups

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PulseNet Surveillance

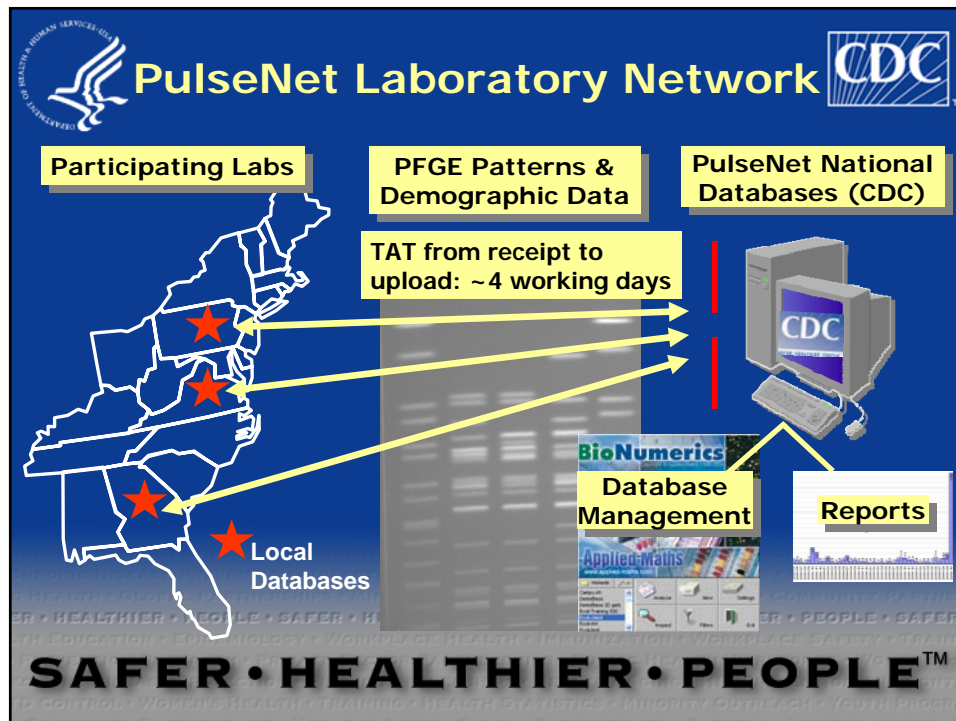
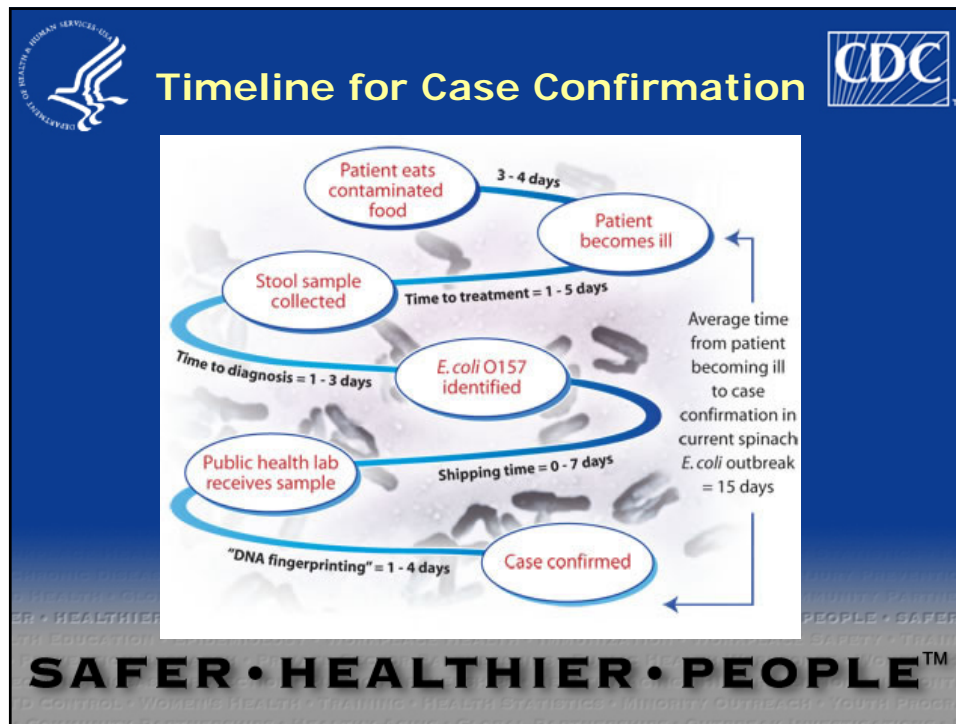
Organisms of Interest


- ◆ *E. coli* O157:H7/other STECs
- ◆ *Campylobacter jejuni*
- ◆ *Salmonella*
- ◆ *Vibrio cholerae*
- ◆ *Listeria monocytogenes*
- ◆ *Yersinia pestis*
- ◆ *Shigella*

PulseNet Participant Duties


- ◆ Perform real-time PFGE
- ◆ Report outbreaks on WebBoard
- ◆ Analyze/Upload patterns
- ◆ Compare local patterns to those on WebBoard and post responses
- ◆ Perform daily/weekly cluster searches in local database
- ◆ Attend annual update meeting
- ◆ Report clusters to epis/aid in outbreak investigations

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PulseNet Database Team at CDC




PulseNet Central Duties

- ◆ Analyze/Upload patterns (w/in 24 hours of receipt)
- ◆ Report multi-state clusters on WebBoard
- ◆ Perform daily/weekly cluster searches in national databases
- ◆ Post responses to WebBoard (w/in 48 hours)
- ◆ Verify band assignments
- ◆ Produce quarterly/annual reports
- ◆ **Name/report clusters to PHLs and CDC epis (w/in minutes of finding cluster)**
- ◆ Train participants and provide technical assistance
- ◆ Update line lists/pattern frequencies and further aid in outbreak investigations
- ◆ Create PulseNet newsletter and update website
- ◆ Present at meetings (including annual update meeting)


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PulseNet Reports (within network)

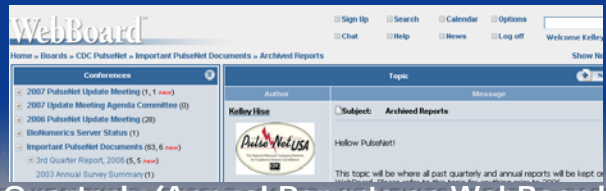


	A	B	C	D
1	Key	LabID	SourceCountry	SourceStat
2	WA 10038	WA		
3	IL 2006000896	IL	USA	IL
4	PA 06E00885	PA	USA	PA
5	OR G06-0948	OR	USA	WA
6	OR G06-0956	OR	USA	WA



Cluster Line Lists


Pattern Frequency Reports




- Top 5 serotypes/patterns
- Outbreak log
- Pattern images
 - Top patterns
 - Cluster patterns


Quarterly/Annual Reports on WebBoard

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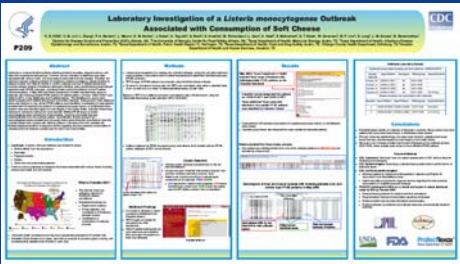


PulseNet Reports: Public






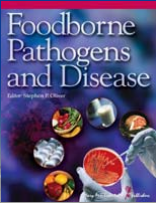
PulseNet Newsletter



Posters/Presentations at Meetings




PulseNet Website
www.cdc.gov/pulsenet




Publications

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Future of PulseNet



- ◆ Strengthen collaborations with food industry
- ◆ VetNet (USDA-ARS)
 - Currently collecting *Salmonella* and *Campylobacter* NARMS isolates
 - Databases housed and maintained at CDC
 - Next step: signed MOU to enable sharing of data
 - Data will then be maintained with USDA-ARS in Athens, GA
- ◆ Create a web portal for use by participants and epidemiologists
- ◆ Increase collaboration with FoodNet, NARMS and Epi-X
 - Link FoodNet, NARMS and PulseNet databases



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Future Reports

- ◆ PDF files posted on public website
 - Pattern image
 - PulseNet pattern designation
 - Frequency for that pattern in the PulseNet database for that year
 - Currently available for *E. coli* O157:H7 and *Listeria* for 2002-2005
- ◆ Pattern images able to be imported into local database
 - Cluster/outbreak patterns
 - Currently provided within network (quarterly/annual reports)

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Thank you!



The National Molecular Subtyping Network
for Foodborne Disease Surveillance

Questions?

"THE FINDINGS AND CONCLUSIONS IN THIS PRESENTATION HAVE NOT BEEN FORMALLY DISSEMINATED BY CDC AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY."

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