



PulseNet USA and Beyond

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PulseNet USA is not what it used to be



- ◆ A national network of public health and food regulatory agency laboratories coordinated by CDC
 - State health departments, local health departments, federal agencies (CDC, USDA, FDA)

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Increasing participation by non-public health laboratories in PulseNet



	2005	2007
USDA/FDA laboratories	12	15
State Agricultural & Environmental Laboratories	1	5
Universities	1	4

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Collaboration with other subtyping networks



✦ USDA VetNet

- USDA/ARS Research Database
- Repository for USDA/FSIS *Salmonella* HACCP patterns
- MoU being prepared

✦ PulseNet International



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Objectives of PulseNet USA



- ◆ Detect foodborne disease case **clusters** by PFGE
- ◆ Facilitate early identification of common source **outbreaks**
- ◆ 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

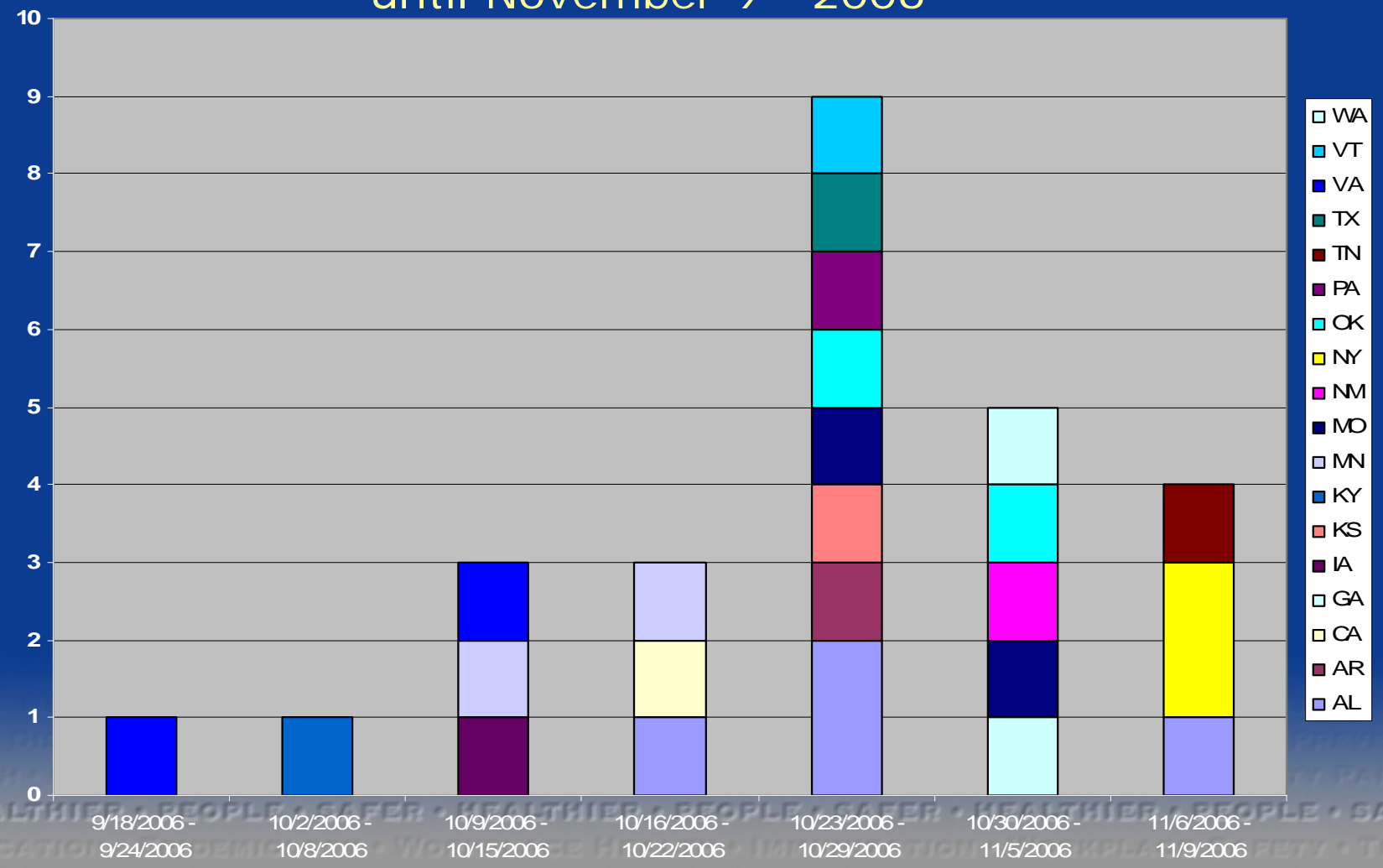
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States involved in the S. Tennessee outbreak



until November 9 - 2006



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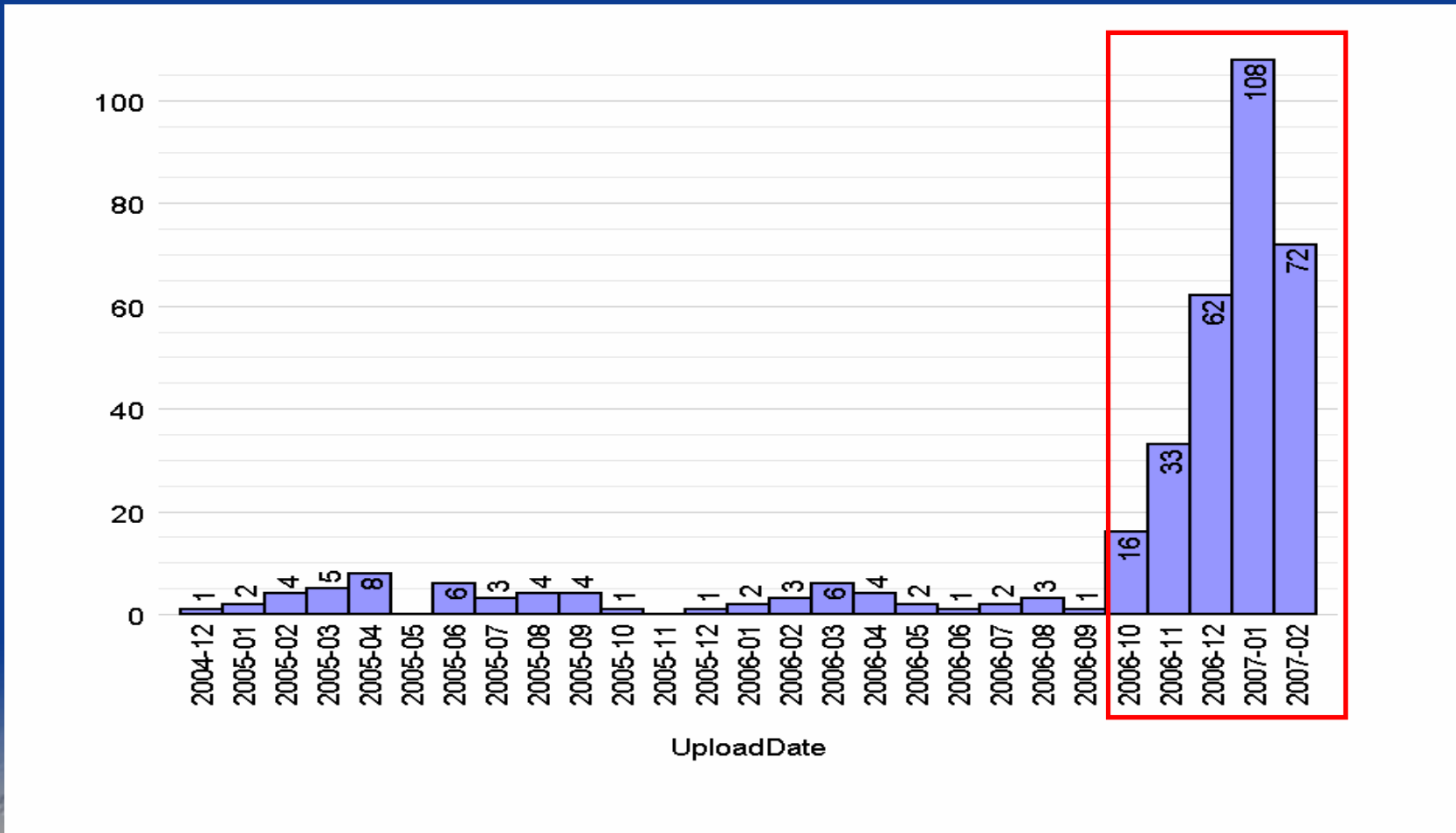
Preliminary data



Salmonella Tennessee pattern JNXX01.0011



(main outbreak pattern)



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S. Tennessee outbreak numbers (April 11, 2007)



- ◆ 567 cases
- ◆ 47 states involved
- ◆ No international cases
- ◆ Median age 51 years (<1- 95 years)
- ◆ 73 % females
- ◆ No deaths, 20% hospitalized
- ◆ Among females: 1/3 UTI

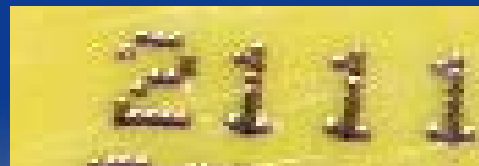
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Salmonella Tennessee

The culprit:



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Unsolved questions from the S. Tennessee outbreak related to peanut butter 2006-07



1. Why were three PFGE patterns involved?
2. Why did we only detect two of the patterns in samples from the peanut butter?
3. Why did we see a predominance of females among the patients?
4. Why so many UTI isolates?
5. How does S. Tennessee survive in peanut butter? Does it grow in peanut butter?

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1. Why were three PFGE patterns involved?



- ◆ Strains evolve over time in their natural environment
 - New PFGE-patterns arise
- ◆ Maybe the strain has been present in the production environment for several years
- ◆ Were only three patterns involved in the outbreak?
- ◆ We have seen an increase in human *S. Tennessee* infections reported through PHNIS and PulseNet the last few years

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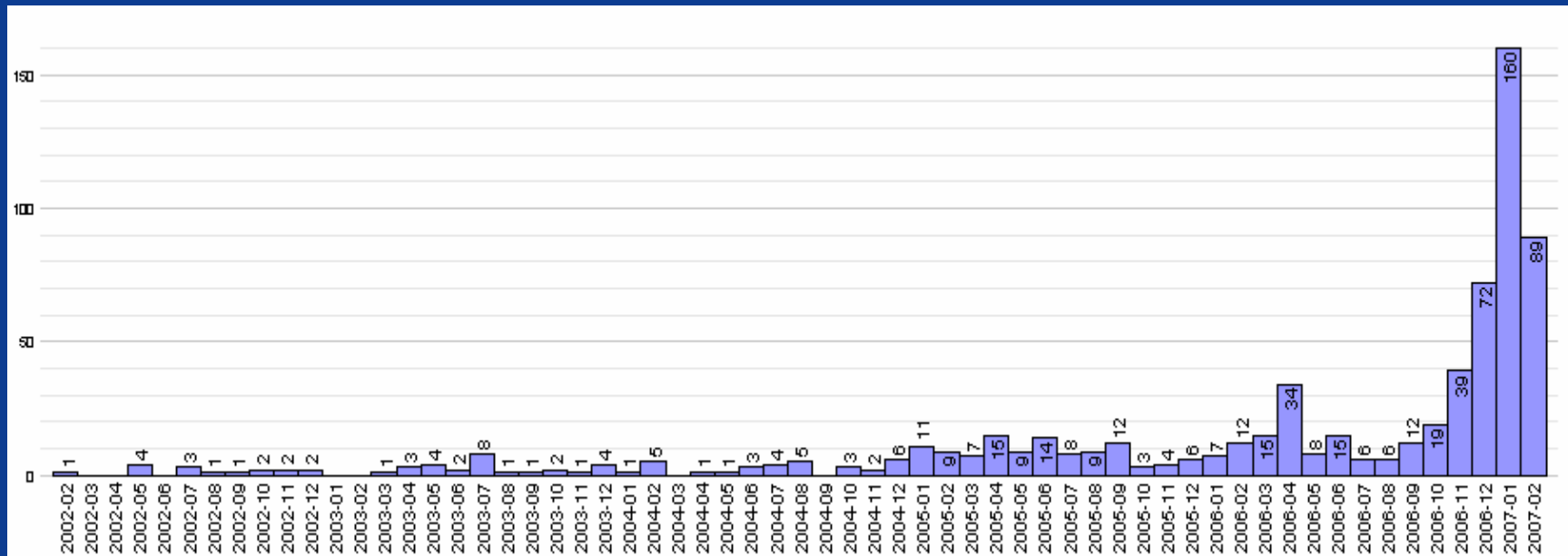
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Salmonella Tennessee in the U.S. 2002- 2007



All patterns uploaded to the PulseNet USA database



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2. Why did we only detect two of the patterns in samples from the peanut butter?



	<u>Serotype</u>	<u>PFGE-Xbal-patter...</u>	<u>PFGE-BlnI-pattern</u>	<u>SourceCountry</u>	<u>SourceSite</u>
→	Tennessee	JNXX01.0010	JNXA26.0001	USA	Peanut Butter
	Tennessee	JNXX01.0010	JNXA26.0001	USA	Stool
→	Tennessee	JNXX01.0011	JNXA26.0001	USA	Peanut Butter
	Tennessee	JNXX01.0011	JNXA26.0001	USA	Stool
	Tennessee	JNXX01.0026	JNXA26.0001	USA	Urine
	Tennessee	JNXX01.0026	JNXA26.0001	USA	Stool

- **Coincidence**

- We don't have more than 22 positive peanut butter samples
- Epidemiological analysis of cases infected with strains with pattern 0026 shows strong association to peanut butter

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3. Why did we see a predominance of females among the patients?



- ◆ Do women eat more peanut butter than men?
- ◆ Women get UTI much more often than men
- ◆ Even if we only consider stool isolates females predominated in the outbreak
 - Sex ratio F/M 2:1

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4. Why so many UTI isolates?

- ◆ The outbreak strain has a predilection for the urinary tract
- ◆ PHLIS data: Serotype Tennessee is more often associated with UTI than most other *Salmonella* serotypes
- ◆ Why?
 - The outbreak strain to be sequenced to see if it contains virulence genes that may explain this

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5. How does S. Tennessee survive (and grow) in peanut butter?



- ◆ Following any foodborne outbreak questions like this arise
- ◆ Answered in collaboration with industry and academia
- ◆ We should openly share outbreak isolates with our partners
- ◆ Answering these questions are essential for risk analysis and to guide control and prevention measures in food safety

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**We have an
obligation to the
society to
collaborate on food
safety**

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Acknowledgements



- ◆ All PulseNet participants and collaborators nationally and internationally

Disclaimer:

“The findings and conclusions in this presentation have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.”

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