Summarizing FoodNet Laboratory Survey Responses in Tennessee from 2017-2021

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Background

- As laboratory practices become more advanced with **culture-independent testing**, laboratories will shift the methods used to test for enteric pathogens
- CDC tracks laboratory testing practices in FoodNet states each year using **FoodNet Laboratory Survey**
- Consistently captures information about pathogens tested onsite, test types, and reflex culturing practices
- Tennessee has laboratory survey responses for 15 years, but this summary uses data captured between **2017-2021**

Aims

Summarize foodborne pathogen testing practices in Tennessee laboratories:

1. In 2021
2. Over time (2017-2021)

Methods

Data Source:

- CDC's FoodNet Laboratory Survey
- Survey responses from Tennessee Laboratories

Inclusion Criteria

- Tennessee laboratories (commercial and clinical) who test for at least one foodborne pathogen (*Cyclospora, Cryptosporidium**, Norovirus, *Campylobacter*, Shiga-toxin producing *E. coli* (STEC), *Salmonella, Shigella, Vibrio, Yersinia, Listeria*) and fill out laboratory survey at end of any year from 2017-2021

Variable Information

- Onsite testing, pathogen-specific testing methods, and reflex culturing captured for all relevant pathogens from 2017-2021
- Frequency of test methods for each pathogen (2021 only)

Summary Process

- Datasets merged and variables defined using SAS. Graphs and tables created using Excel.
- Percentages calculated based on number of laboratories who responded "yes" to onsite testing for a specific pathogen in a given year unless otherwise specified

**Cryptosporidium* is still included in the FoodNet Laboratory Survey despite no longer being considered a FoodNet Pathogen.

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Results

- **Smaller percentages of laboratories tested onsite beginning in 2019**, but might be result of lower response rate to survey (Figure 1)
- Testing methods consistent over time, though ***Vibrio* and *Yersinia* testing increased** from 2018 to 2021 (Figure 2)
  - PCR consistently used more than staining and microscopy methods for *Cyclospora* (not pictured)
- Testing methods for **all FoodNet bacterial pathogens included culture and PCR**, *Campylobacter* and STEC additionally use antigen testing (Figure 3)
- **PCR frequency began increasing in 2019**—both alone and with culture) while **culture began decreasing**—both alone and with PCR (Figure 4)
  - Trend consistent for *Salmonella, Shigella, Vibrio,* and *Yersinia. Listeria* saw a dramatic decrease in culture in 2021 (not pictured)

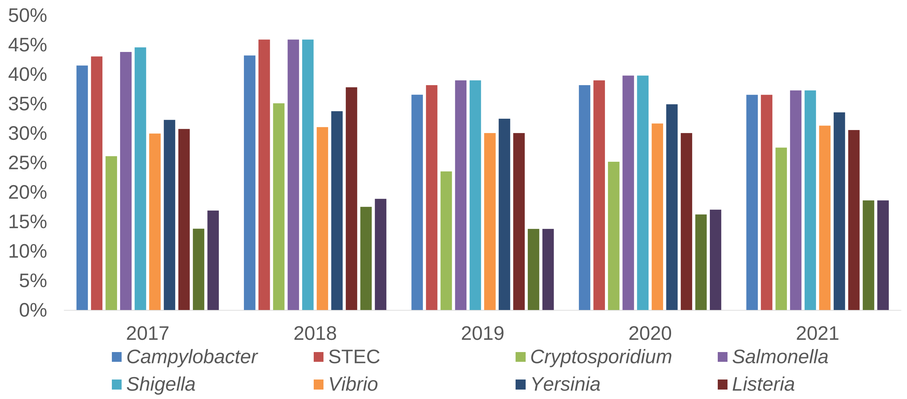

Figure 1: Percentage of Tennessee Laboratories Performing Onsite Testing of FoodNet Pathogens from 2017 to 2021

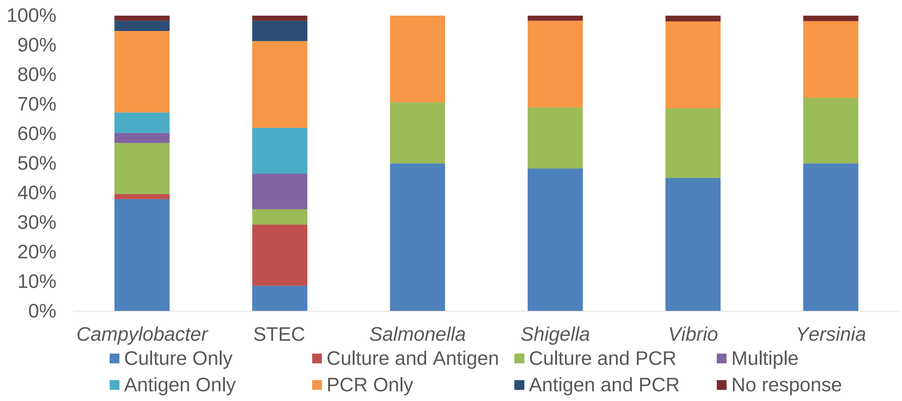

Figure 3: Testing Methods for FoodNet Bacterial Pathogens Used in Tennessee Laboratories in 2021

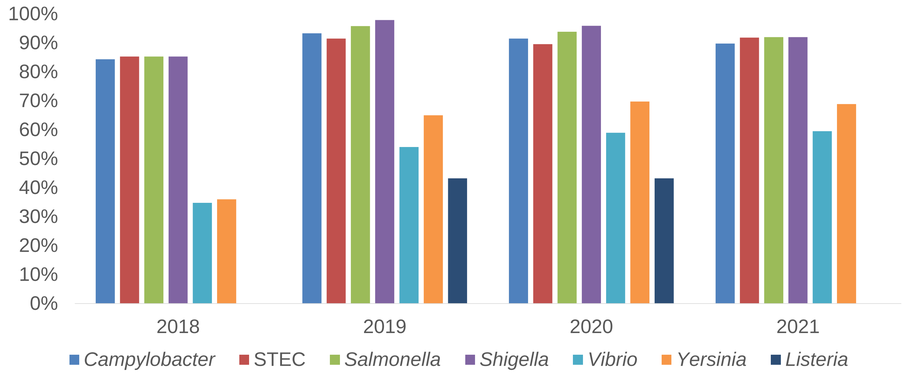

Figure 2: Percentage of Tennessee Laboratories Testing Routinely for FoodNet Pathogens from 2018-2021

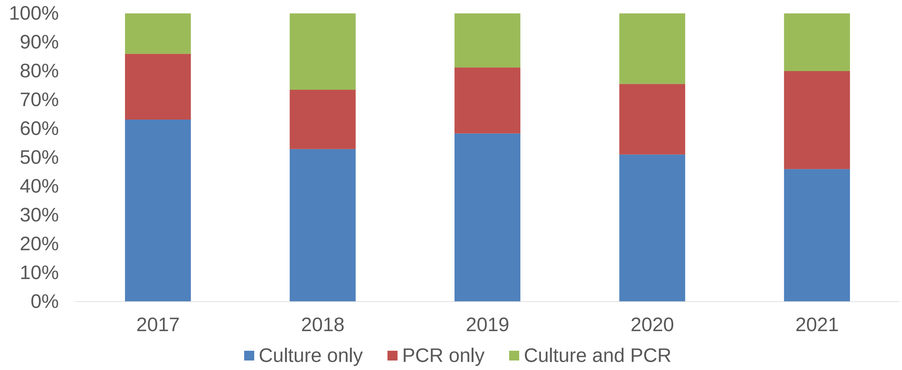

Figure 4: *Salmonella* Testing Methods Used in Tennessee Laboratories from 2017-2021

Discussion

- Increase in CIDT can **improve disease burden estimates**, improve detection of hard-to-culture pathogens and shorten time to pathogen identification, allowing interviews to be conducted faster with greater likelihood of capturing accurate food history
- Decreasing frequency of culture among clinical and commercial laboratories has concerning implications for public health surveillance activities
  - CIDTs usage may indicate **specimens and/or isolates not sent to state public health laboratory** (SPHL)
    - Sending specimens rather than isolates **increases burden** on SPH
  - Surveillance relies on specimens and/or isolates being sent to SPHL for further characterization and sequencing
    - Without sequencing **cases cannot be genetically linked** which prevents investigators detection of some clusters and outbreaks of enteric illnesses
  - **Antibiotic resistance is not captured** with CIDTs
- For bacterial pathogens, **diagnosis by a CIDT can only classify someone as a probable case** because confirmed cases require isolate

Lessons Learned

- Developed an understanding of structure of relationships between state health departments and clinical and public health laboratories and gained an understanding of laboratory practices for foodborne and enteric diseases in Tennessee
- Learned how to conduct targeted food history interviews to capture exposure information for cases and how to use interviews to begin conducting cluster and outbreak investigations
- Learned the advantages and disadvantages of growing prevalence of CIDT usage in clinical laboratories and their implication for public health

Acknowledgements

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