CIDT Challenges and Changes in Colorado

Emily Travanty, PhD
Scientific Director
Laboratory Services Division
Colorado Department of Public Health and Environment (CDPHE)

InFORM 2017
PulseNet Session 3: Current Laboratory-Based Strategies in Addressing CIDTs
Culture-Independent Diagnostic Testing in Colorado

- **Clinical Laboratories** - responsible for patient diagnostic testing
- **Public Health Laboratory** - responsible for characterization of clinical isolates
- **Epidemiologists** - responsible for disease surveillance
Beginning in 2014

- Information about testing methods used in clinical labs is gathered through annual laboratory surveys
- Clinical labs in Colorado begin to implement syndromic multiplex PCR panels, especially GI panels
What can be done to preserve isolates?

• Lab and Epi worked together to develop a plan to ensure the continued availability of isolates for downstream epidemiological characterization

• Input from stakeholders including clinical labs and local public health was collected through a series of open forums

• Board of Health Rules were adopted requiring submission of isolates or clinical material
Colorado Specimen Submission Requirements - Enteric Pathogens

- Require clinical labs to submit isolates or clinical material for:
  - Salmonella
  - Shigella
  - Shiga toxin-producing E. coli (STEC)
  - Vibrio
  - Yersinia
Specimen Submission Requirements for Clinical Microbiology Laboratories

Effective November 14, 2015, the CDPHE Communicable Disease Branch requires clinical microbiology laboratories send certain culture isolates and/or clinical material to the CDPHE laboratory in addition to reporting positive lab results. The CDPHE laboratory performs additional testing [serotyping, serogrouping, pulsed-field gel electrophoresis (PFGE)] on submitted isolates to identify outbreaks due to common strains or subtypes and to better understand pathogens that adversely impact the public’s health. There is no fee when submitting isolates/clinical material to the CDPHE laboratory per this policy.

All clinical microbiology laboratories in Colorado must submit the following suspected or confirmed isolates or clinical material to the CDPHE laboratory:

- *Bacillus anthracis*
- *Brucella* species
- *Corynebacterium diphtheriae*
- *Cyclospora cayetanensis*
- *Escherichia coli* O157 and Shiga toxin-producing *E. coli*
- *Francisella tularensis*
- *Haemophilus influenzae* (invasive body site)
- *Listeria monocytogenes* (from each positive specimen)
- *Neisseria meningitidis* (invasive body site)
- *Salmonella* species (including typhi and non-typhi species)*
- *Shigella* species*
- Vancomycin-resistant (and intermediate) *Staphylococcus aureus*
- *Vibrio cholerae* *
- *Vibrio non-cholerae* *
- Viral hemorrhagic fever
- *Yersinia pestis*

*If culture-independent methods (i.e., PCR, EIA, other rapid tests, etc.) are used to detect Shiga toxin, suspected *E. coli* O157, *Salmonella*, *Shigella*, or *Vibrio*, please forward inoculated broth or stool specimen/swab to the CDPHE lab.

https://www.colorado.gov/pacific/cdphe/report-a-disease
Problem solved?

- Yes! - Isolates remain available for down stream characterization to fulfill epidemiological surveillance needs

- No! - Burden of isolate recovery has been shifted from the clinical labs to the state public health lab
  - Increased turnaround time?
  - Viability decreased due to extended time lapse from specimen collection to isolation attempted?
  - Non-viable
  - Cost
  - Staff
CIDT Specimen Submission

CIDT Specimen Volume

- FY16
- FY17
- FY18

- CIDT Specimen Submitted
- CIDT Projected
CIDT Specimen by Test

- Salmonella
- Shigella
- STEC
- Vibrio
- Yersinia

FY16
FY17
FY18
CIDT Isolate recovery

CIDT Recovery Rate

FY16 FY17 FY18

Salmonella
Shigella
STEC
Vibrio
Yersinia
Estimated CIDT Costs per patient specimen - reagents & consumables

- Culture & Enrichment $6.22
- Identification (VITEK2) $8.62
- STEC PCR $28.47
- Traditional agglutination serotyping $11.14
- Molecular Serotyping (xMAP) $18.29
CIDT Staffing

• Shifting the burden of isolate recovery at the PHL requires increased hands on staff time

• FTE at the PHL is limited by state rules and grant funds

• Current staff are already cross-trained and perform multiple duties in addition to CIDT isolate recovery
New Approaches

- **Funding**
  - Federal (Grants, ELC, etc)
  - State - general fund request based on need for additional resources to meet the Board of Health requirements

- **Staffing**
  - Cross training
  - Increase FTE (funding dependent), New Work Lead position in the PHM laboratory provides an additional set of hands for culture isolation

- **Methods**
  - Media
  - MALDI
  - Establish strict guidelines (such as maximum number of colony picks for STEC PCR)
  - Streamline workflow and/or replace with WGS
Questions?