Vibrio surveillance in the CIDT Era

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Cholera and Other *Vibrio* Illness Surveillance (COVIS)

- National surveillance for vibriosis and cholera
  - 1988–present (vibriosis nationally notifiable in 2007)
  - 144 vibriosis cases in 1988 to **over 2,000** in 2017
- Case report form collects information on:
  - illness and underlying health conditions
  - recent seafood consumption
  - recent exposure to water or marine life
  - source(s) of implicated seafood
- Information from COVIS helps track *Vibrio* infections, monitor trends in patient, food, and environmental risk factors, and to respond to clusters and outbreaks
2017 Update to Vibriosis Case Definition

CASE CLASSIFICATION

- **NEW**: Supportive laboratory evidence: detection of *Vibrio* in a clinical specimen by a culture-independent diagnostic test
  - Classified as a *probable* case
- **CONTINUING**: Confirmatory laboratory evidence: isolation of *Vibrio* from a clinical specimen
  - Classified as a *confirmed* case

CRITERION FOR A NEW CASE

- **NEW**: Identification of different species of *Vibrio* from an individual are considered separate cases
  - COVIS will continue collecting data by patient; individuals with multiple species will count as a single case
Vibriosis Case Classification Based on Culture Results

- **Culture performed**
  - Positive → Confirmed case
  - Negative → Not a case or epi-linked*

*CDC requests that a COVIS form is completed for cases that were epidemiologically linked to a laboratory-identified case*
Vibriosis Case Classification Based CIDT Results

CIDT performed

- Positive detection of *Vibrio*
- Reflex culture performed
  - Positive culture: Confirmed Case
  - Negative Culture
    - No Reflex Culture Performed
      - No *Vibrio* detected
        - Not a case or epi-linked*

*CDC requests that a COVIS form is completed for cases that were epidemiologically linked to a laboratory-identified case*
### Surveillance and Response: Culture vs. CIDT

<table>
<thead>
<tr>
<th></th>
<th>Culture-confirmed</th>
<th>CIDT positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory results</td>
<td><em>Vibrio</em> species identification (20+ species)</td>
<td>Presence of <em>Vibrio</em> (assays for multiple species or <em>V. cholerae</em>), test type/name</td>
</tr>
<tr>
<td>PFGE</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Whole genome sequencing</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Antimicrobial susceptibility testing</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Regulated by the National Shellfish Sanitation Program (NSSP)</td>
<td><em>V. parahaemolyticus, V. vulnificus</em></td>
<td>Not included</td>
</tr>
</tbody>
</table>
Vibriosis CIDT Trends, 2017–2018

Trend data are preliminary and subject to change as additional cases or laboratory results are reported.
Total vibriosis cases by year reported to COVIS (N=8,605)
Confirmed vibriosis cases reported to COVIS, 2017–2018 (N=2,459)
All vibriosis cases reported to COVIS, 2017–2018 (N=3,635)
2017 Vibriosis cases by month (N=2,043)
2018* *Vibrio* cases by month (N=1,581)

*2018 data has not been received from all reporting partners*
Case Classification by Region, 2017–2018 (N=3,635)
Characteristics of vibriosis cases identified from a stool specimen, 2017–2018

Trend data are preliminary and subject to change as additional cases or laboratory results are reported
Probable (N=1,176) vs. Confirmed (N=1,353): Foodborne Exposures, 2017–2018

Confirmed cases report higher rates of:
- Consumption of oysters or clams
- Overall seafood consumption
Probable (N=1,176) vs. Confirmed (N=1,353): Water Exposures, 2017–2018

**Confirmed** cases report higher rates of:
- Exposure to a body of water
- Any marine exposure (water, marine life, or drippings from seafood)
Probable (N=1,176) vs. Confirmed (N=1,353): Clinical Compatibility, 2017–2018

Probable and confirmed cases have similar rates of:

- diarrhea
- visible blood in stools
- vomiting
- cramps
Probable (N=1,176) vs. Confirmed (N=1,353): Co-detection, 2017–2018

8% of confirmed cases and 18% of probable cases report detection of one or more non-Vibrio organisms

(There had to be a meme somewhere in here)
To Summarize...

- Reporting of probable CIDT positive cases to COVIS began in 2017
- Total cases reported increased considerably in 2017 as well as culture confirmed cases, and a large portion were probable cases without an identified species
- Consumption of seafood, especially shellfish, is lower in probable cases
- Exposure to water as well as other marine exposures is lower in probable cases
- Confirmed and probable cases have similar reporting of GI symptoms
- Co-detections are higher in probable cases

So...
Are a portion of CIDT detected cases “false positives”?

Potential considerations to answer this question...

• Do all true positives have a seafood or water exposure?
• How should cases lost to follow-up be treated?
• What factors are associated with the varying detection rates in different regions?
• Logistical reasons that lead to detection but no growth on cultures?
• Are we getting the full story in COVIS?
• If there are false positives, how would they be defined?
Complete reporting is needed to evaluate differences between confirmed and probable cases

- **CIDT detected cases**, regardless of culture result meet the current national vibriosis case definition

- COVIS team will continue working with FoodNet, APHL, and state partners to analyze CIDT results and update guidance for reporting if appropriate

- If resources are limited, **prioritize investigations for culture confirmed cases**
Questions?
Email: COVISResponse@cdc.gov

Thank you to:
National Surveillance Team
State Partners
FoodNet

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.