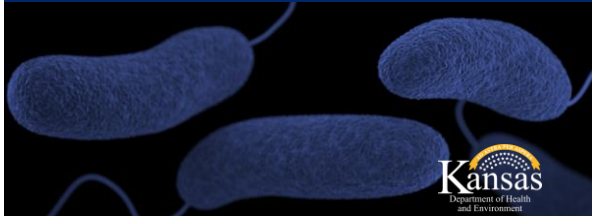
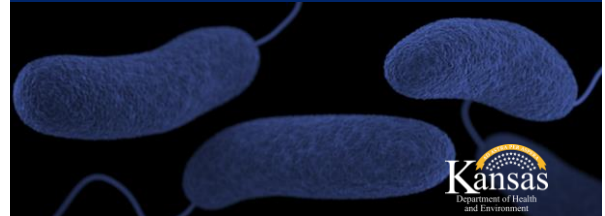


Vibriosis

Lindsey Martin Webb, MPH



History & Epidemiology



Vibrio spp.



- Curved, motile, gram-negative rod-shaped bacilli
- Family: Vibrionaceae
- More than 75 species



Vibrio spp.

- Free-living inhabitants of coastal marine waters
 - Sometimes found in estuaries and fresh or brackish inland streams and lakes
 - Can form biofilms
- Multiple species cause human illness
 - *V. cholerae*
 - *V. parahaemolyticus*
 - *V. vulnificus*



Vibrio cholerae

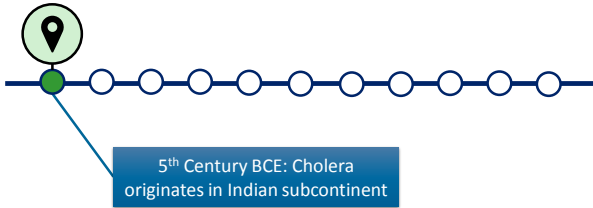
- Over 200 serogroups
- Can carry cholera toxin (CT) gene
- 2 distinct illnesses:
 - Epidemic cholera
 - Toxigenic *Vibrio cholerae* O1
 - Toxigenic *Vibrio cholerae* O139
 - Non-cholera vibriosis
 - All other *V. cholerae*



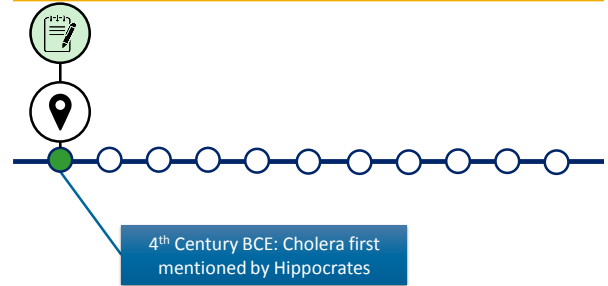
History of Cholera



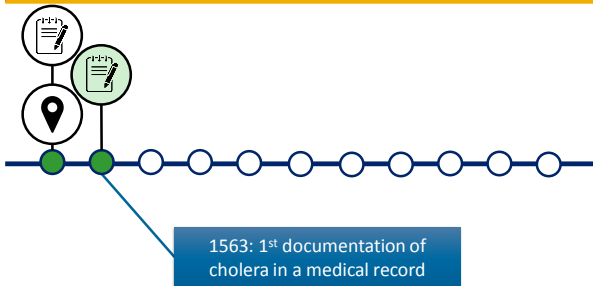
History of Cholera



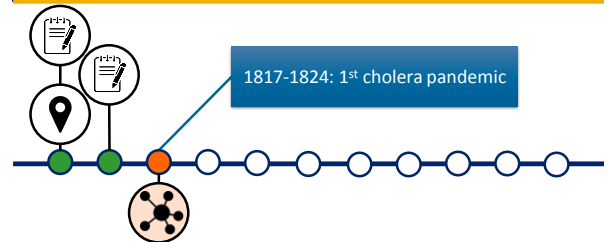
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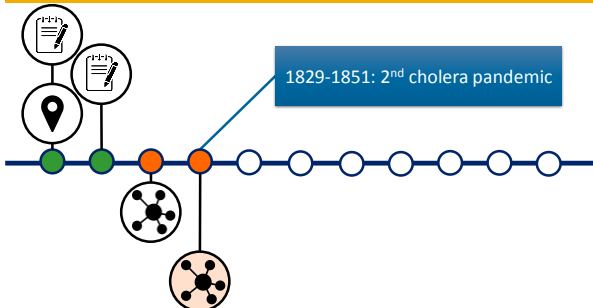
History of Cholera



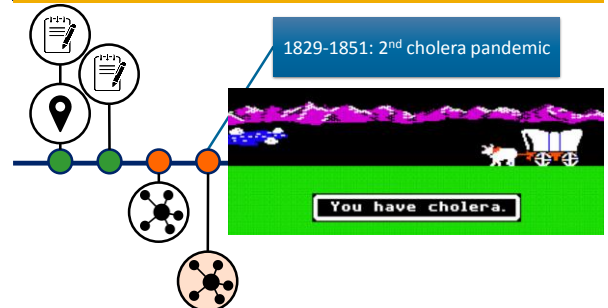
History of Cholera



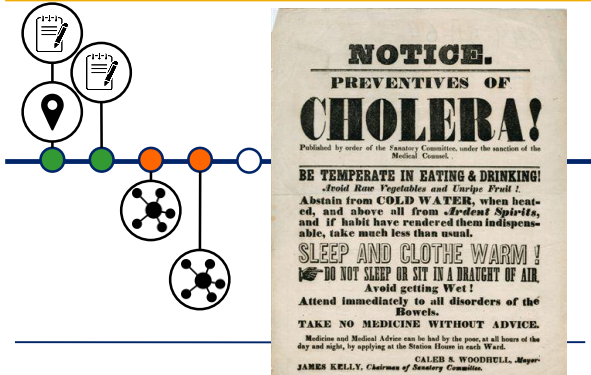
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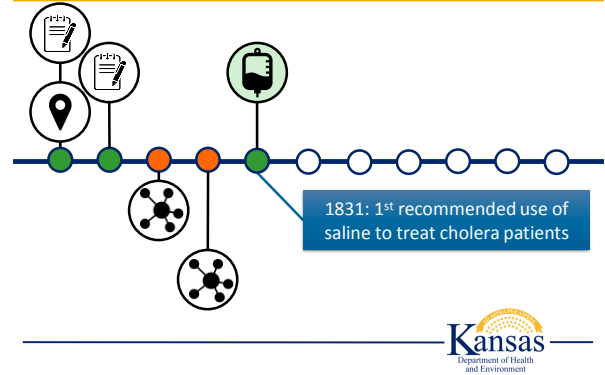
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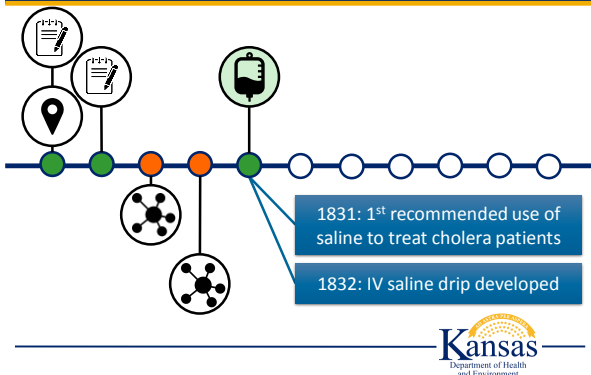
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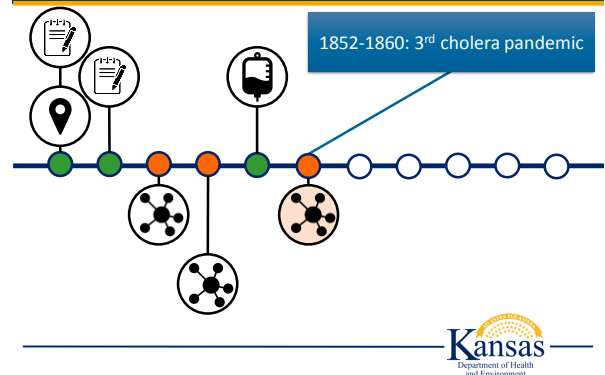
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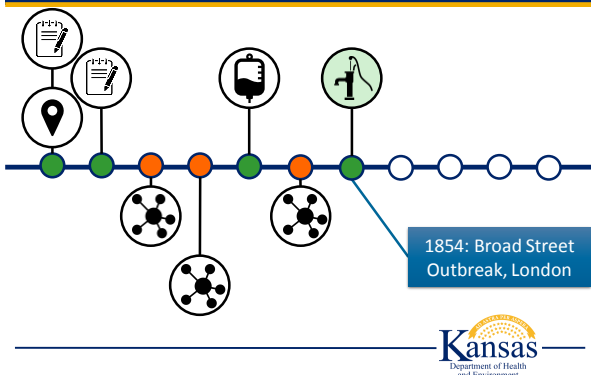
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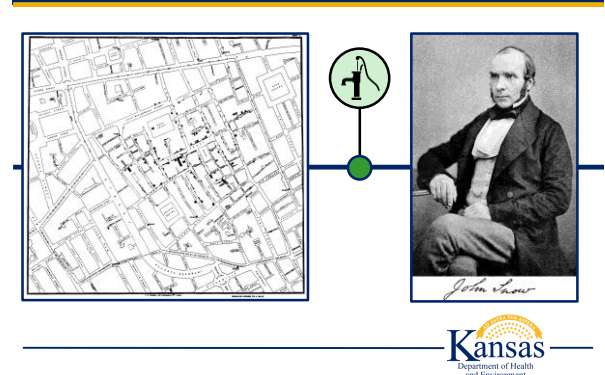
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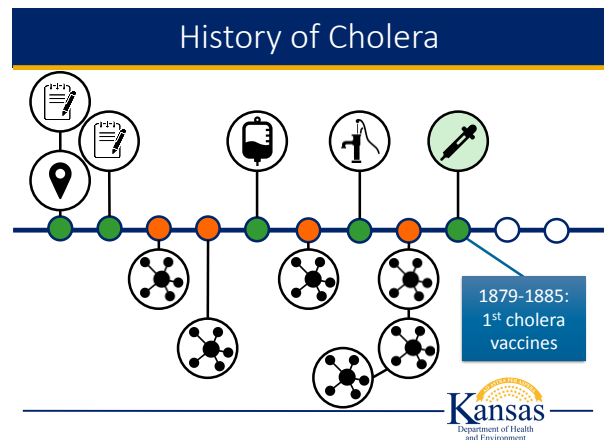
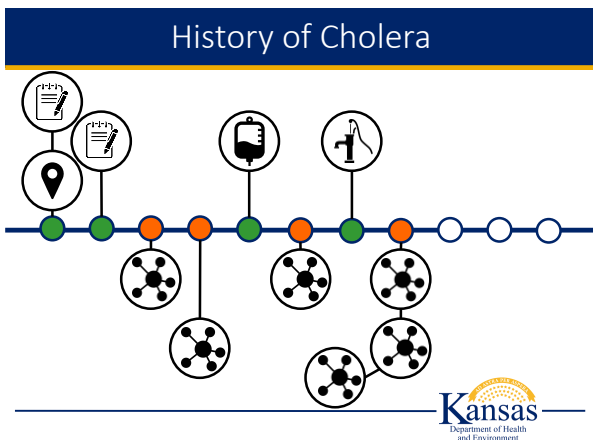
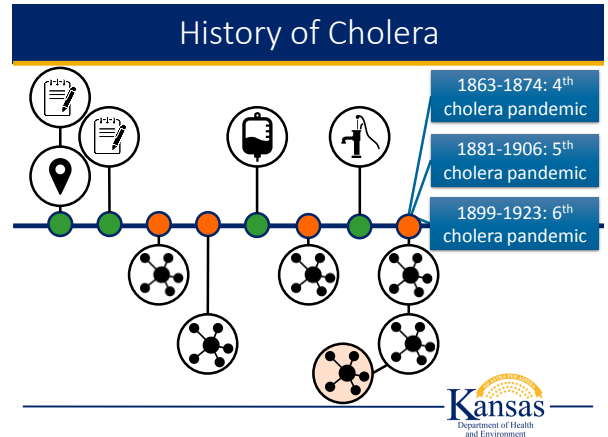
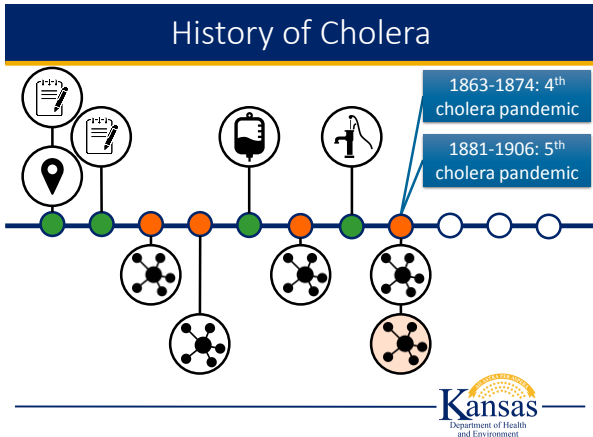
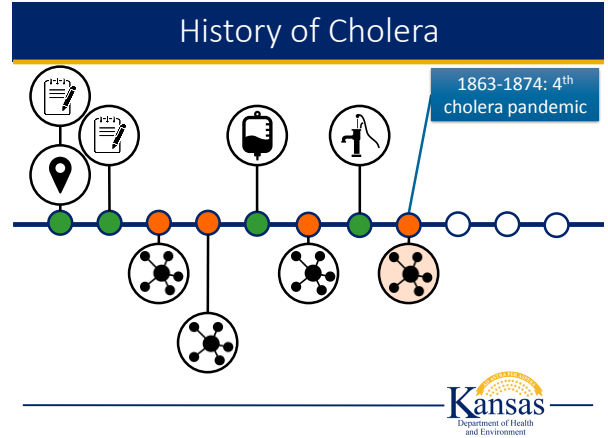
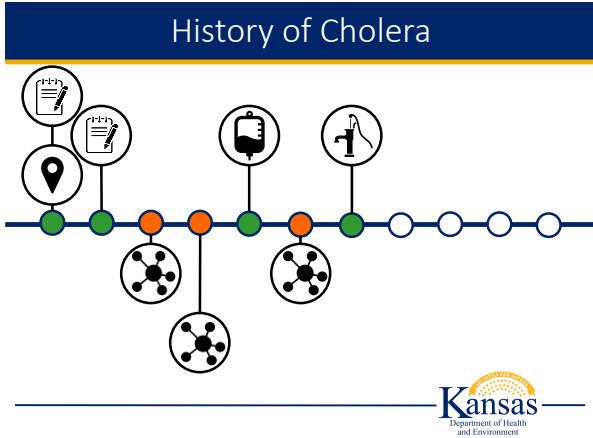


History of Cholera

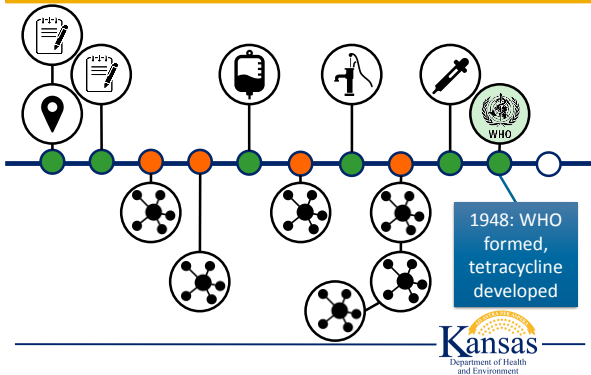


History of Cholera

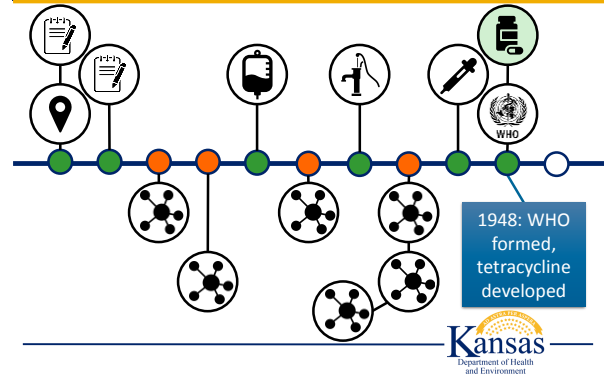




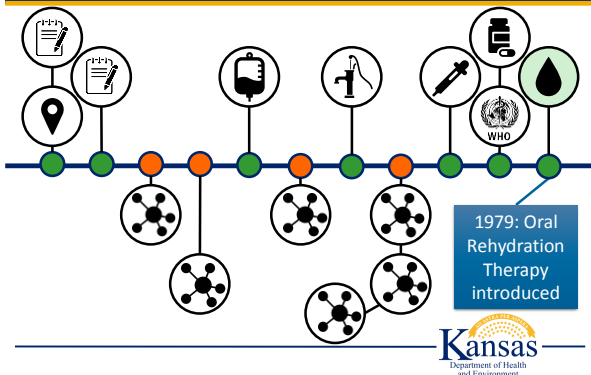
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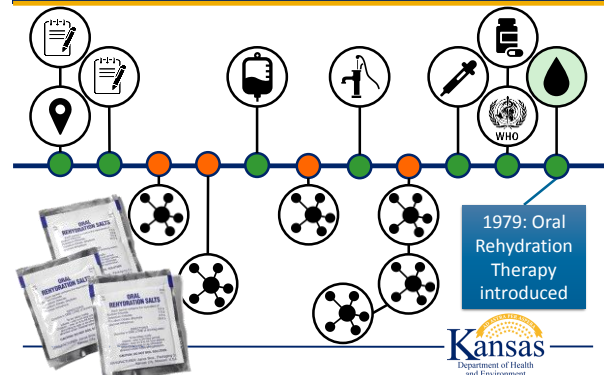
History of Cholera



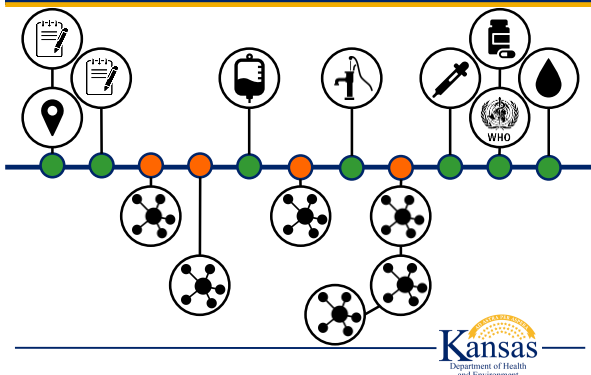
History of Cholera



History of Cholera



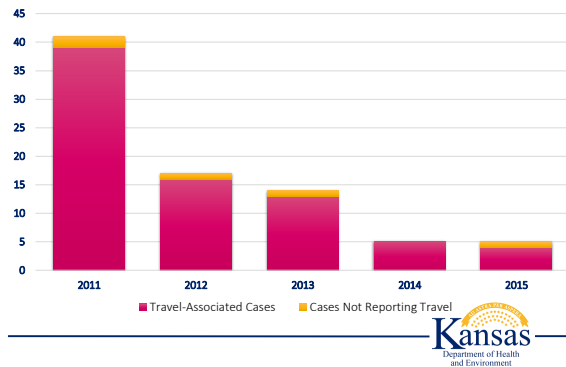
History of Cholera



Cholera in the Present

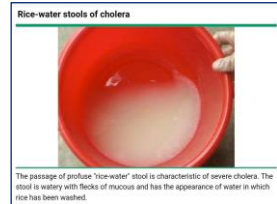
- 1961 – present: 7th cholera pandemic
 - 1994: 94 countries report cholera cases
 - Largest number of affected countries in history
- 2008 – 2009: Zimbabwe
 - 98,596 cases & 4,369 deaths
- 2010 – 2017: Haiti
 - Began 10 months after earthquake
 - Over 700,000 cases & over 10,000 deaths
- 2016 – 2018: Yemen
 - Over 1,000,000 cases & over 2,000 deaths

Reported Cholera Cases, US 2011-2015



Cholera Symptoms

- Infection often mild or without symptoms
- 5%-10% will have severe illness
 - profuse watery diarrhea
 - vomiting
 - rapid heart rate
 - loss of skin elasticity
 - dry mucous membranes
 - low blood pressure
- Complications
 - renal failure
 - coma



Kansas Department of Health and Environment

Vibriosis

- Transmitted through contaminated water and seafood
 - Most cases occur between May and October
- Illness caused by about ~12 *Vibrio* species
 - *V. parahaemolyticus* is most common
 - *V. alginolyticus*, *V. cholerae*, *V. fluvialis*, *V. vulnificus*



Kansas Department of Health and Environment

Vibriosis Symptoms

- Gastrointestinal illness
- Wound infections
 - Necrotizing fasciitis
- Bacteremia, septicemia

Vibrio Vulnificus: What to Know About the 'Flesh-Eating Bacteria' That Killed a Man With a New Tattoo

Flesh-eating bacteria *Vibrio* is more common but just as dangerous as most think

Kansas Department of Health and Environment

Laboratory Testing and Reporting



Testing for *Vibrio* at Clinical Labs

- Culture
- Multiplex-PCR (e.g. BioFire)

Analyte	Assay(s)	Gene Target(s)
<i>Vibrio</i> spp.	Vibrio	<i>gyrB</i>
<i>Vibrio cholerae</i>	Vchol	<i>toxR</i>

Table 2. Possible Assay Results and Corresponding Vibrio Test Results

FilmArray GI Interpretations	Vibrio (Vibrio) Assay	<i>V. cholerae</i> (Vchol) Assay	Description
Vibrio: Not Detected	Negative	Negative	No <i>Vibrio</i> species detected
<i>Vibrio cholerae</i> : Not Detected	Negative	Negative	No <i>Vibrio</i> species detected (not <i>V. cholerae</i>)
Vibrio: Detected	Positive	Negative	<i>Vibrio</i> species detected (not <i>V. cholerae</i>)
<i>Vibrio cholerae</i> : Not Detected	Positive	Negative	<i>Vibrio</i> species detected (not <i>V. cholerae</i>)
Vibrio: Detected	Any Results	Positive	<i>Vibrio cholerae</i> detected OR <i>Vibrio cholerae</i> and one or more other <i>Vibrio</i> species detected

Source: BioFire

The FilmArray GI Panel is indicated as an aid in the diagnosis of specific agents of gastrointestinal illness and results are meant to be used in conjunction with other clinical, laboratory, and epidemiological data. Positive results do not rule out co-infection with organisms not included in the FilmArray GI Panel. The agent detected may not be the definite cause of the disease.

-BioFire Intended Use Excerpt

Kansas Department of Health and Environment

Testing for *Vibrio* at Public Health Labs

- Testing for *Vibrio* at KHEL
 - BioFire (enteric screen for outbreak specimens)
 - Culture, incl. species identification
 - For *V. cholerae*: send to CDC
- Testing of *Vibrio cholerae* isolates at CDC
 - Cholera Toxin
 - Serotype
 - O1
 - O139
 - Non-O1, non-O139
 - Biotype, Serotype



Cholera vs. Vibriosis

Cholera

V. cholerae

cholera toxin

O1 or O139

Vibriosis

other species

not toxigenic

other serogroups



Disease Reporting

- Cholera
 - Confirmed and suspect cases
 - Reportable by telephone to the EpiHotline
 - Within 4 hours
 - Based on clinical presentation and exposure history
- Vibriosis
 - Routinely reportable
 - Within 24 hours or by the next business day
 - Usually based on laboratory results



Is it cholera or vibriosis?

We treat all reported cases as **VIBRIOSIS** unless there is a compelling reason to suspect otherwise.

Is it cholera or vibriosis?

Cholera is suspected:

Clinician should call the EpiHotline within 4 hours

Cholera is not suspected:

Fax in the case report to KDHE within 24 hours

Case Investigations



COVIS Program

- Cholera and Other Vibrio Illness Surveillance
- Enhanced surveillance program led by CDC
 - Investigate cases using a standardized questionnaire
 - Provide deidentified clinical, laboratory, and exposure data to CDC
 - Identify and follow epidemiologic, laboratory, and microbiologic trends
 - Weekly calls during vibriosis season (May – December)
- COVIS Report Form
 - General vibriosis questions
 - Specific cholera questions



Case Investigation

Symptoms

- Vomiting
- Diarrhea
- Bloody stool
- Cellulitis
- Septic shock

Medical History

- Cholera vaccine
- Antibiotics
- Chemotherapy
- Diabetes
- Alcoholism

Exposures

- Seafood consumption
- Water exposures
- Travel
- Contact with ill persons



Case Investigation

- Assess for exclusions
 - Food handler
 - Health care worker
 - Day care attendee or worker

Isolation, Work and Daycare Restrictions

K.A.R. 28-1-6 for *Vibrio cholera* infection (cholera):

Control of Cases

- Each person with a case shall be excluded working as a food employee, health care worker, and attending or working in a child care facility for the duration of the acute illness plus 24 hours following resolution of symptoms.

K.A.R. 28-1-6 for Vibriosis (non-cholera *Vibrio* spp.)

Control of Cases

- Each person with a case shall be excluded working as a food employee, health care worker, and attending or working in a child care facility for the duration of the acute illness plus 24 hours following resolution of symptoms.



Next Steps



Shellfish Traceback

Harvester Identification Tag

HARVESTER IDENTIFICATION NO. _____

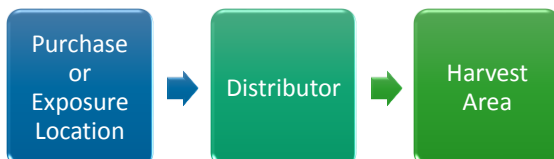
HARVEST DATE: _____

HARVEST LOCATION: _____

TYPE OF SHELLFISH: _____

QUANTITY OF SHELLFISH: _____

THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY AND THEREAFTER KEPT ON FILE FOR 90 DAYS.



CDC – COVIS

- Deidentified exposure data is shared with the COVIS program
- Weekly statewide case counts are reported by species and laboratory test
- CDC provides weekly updates to states based on these reports
- Monthly COVIS working group calls are held



CDC Lab Results for *Vibrio cholerae*

- Cholera Toxin
- Serogroup
 - O1
 - O139
 - Non-O1, non-O139
- Biotype
 - Classical
 - El Tor
- Serotype
 - Inaba
 - Ogawa

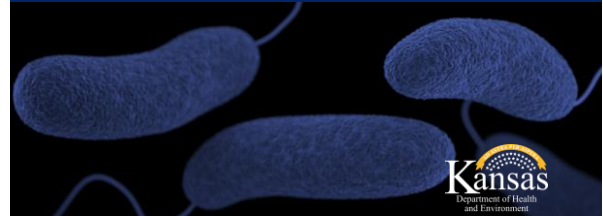


www.kdheks.gov

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Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment
EpiHotline: (877)427-7317

Healthy Kansans living in safe and sustainable environments.

Questions



- <https://www.cdc.gov/vibrio/index.html>
- <https://www.cdc.gov/vibrio/surveillance.html>
- <https://redbook.solutions.aap.org/chapter.aspx?sectionid=88187271&bookid=1484>
- <https://redbook.solutions.aap.org/chapter.aspx?sectionid=88187273&bookid=1484>
- <https://www.ncbi.nlm.nih.gov/pubmed/23100815>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC238357/>
- <https://www.sciencedirect.com/topics/medicine-and-dentistry/vibrio>

