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# Epidemiology of *Vibrio* Infection in Texas, 2008-2017

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**Texas Department of State Health Services**

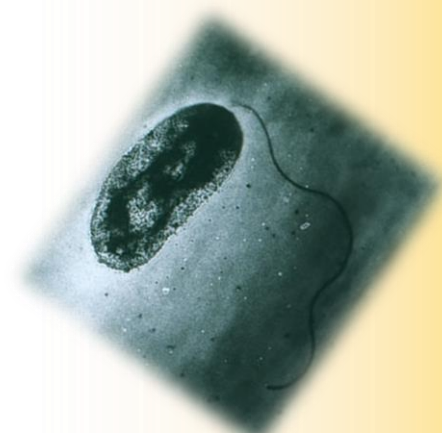
# *Vibrio* Infection

- Organism: *Vibrio* species
  - Highly motile, curved, Gram-negative bacteria
  - Naturally lives in salty and brackish waters in the sediments and on the surface of Mollusks
  - Proliferate in warm (>15C) water
- Seasonal, May-October
- 80,000 illnesses and 100 deaths in the USA every year



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# *Vibrio* infection: Symptoms



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## **Shellfish exposure (GI symptoms)**

- Diarrhea
- Vomiting & nausea
- Abdominal cramps
- Fever & headache



## **Water exposure (wound)**

- Localized swelling
- Red/purplish skin around wound area
- Fever & chills
- Sepsis, necrotizing fasciitis



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# Table 1. Association of *Vibrio* species with different clinical syndromes



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Organism	Gastroenteritis	Wound infection	Primary septicemia
<i>V. alginolyticus</i>	+	+++	
<i>V. cholera</i> non-O1	++	+	+
<i>V. cholera</i> O1	++		
<i>V. fluvialis</i>	++	(+)	(+)
<i>V. mimicus</i>	++	(+)	(+)
<i>V. parahaemolyticus</i>	++	+	(+)
<i>V. vulnificus</i>	+	+++	++

+, less common; ++, common; (+), rare presentation

# Necrotizing fasciitis/ Flesh-eating bacteria



- A rapidly progressive inflammatory bacterial infection of the fascia, with secondary necrosis of the subcutaneous tissues.
- Existing infection, wounds
- *Not always caused by Vibrio!*
- *V. vulnificus, group A Streptococcus, Klebsiella, E. coli, etc.*
- *Symptoms:*
  - ❖ *Swelling, red/purplish skin area (ulcers, blisters, black spots), +fever, chills, fatigue, vomiting. Sepsis. Multiorgan failure.*





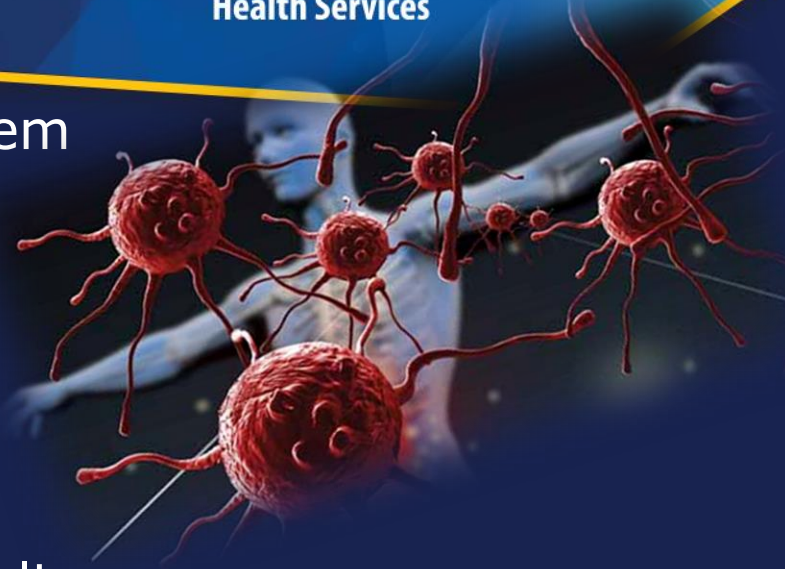
# Who is at Risk



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- People with compromised immune system (alcoholism, chronic liver disease, diabetes, cancer, etc.)
- Eating raw/undercooked seafood
- Exposing open wounds to brackish or salty water



# Vibrio Reporting in Texas

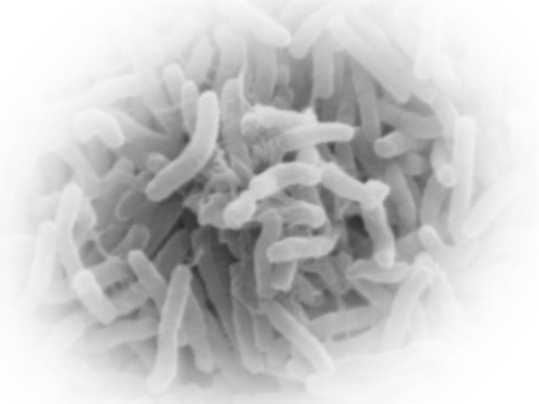


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- *Vibrio* infection should be reported within 1 day
- **Confirmed & Probable cases\***
- In 2017, **CIDTs** (Culture-Independent Diagnostic Tests) were added to case status definition
- All *Vibrio* species isolates must be submitted to the DSHS lab (TAC)
  
- Exposures are categorized by:
  - ✓ Shellfish
  - ✓ Water
  - ✓ Other/Unknown



\***Confirmed cases** – culture confirmation

**Probable cases** - CIDT, epi-linked to a lab confirmed case

# *Vibrio* Reporting in Texas, cont...



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In TX, all reported *Vibrio* cases sub-classified as:

- ***Vibrio parahaemolyticus***
- ***Vibrio vulnificus***
- ***Vibriosis, other or unspecified*** (alginolyticus, v.cholera non-O1 non-139, mimicus, fluvialis, etc)



## **Cholera**

- Toxigenic ***Vibrio cholera* O1 or O139** ("true" Cholera) should be confirmed by DSHS & CDC labs
- Toxigenicity should be confirmed by CDC lab



# Vibrio Reporting, cont...



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- **COVIS** – Cholera and Other Vibrio Illness Surveillance Report

- Clinical information
- Exposure (water; shellfish)
- Seafood investigation section

**CHOLERA AND OTHER VIBRIO ILLNESS SURVEILLANCE (COVIS) REPORT**  
Texas DSHS COVIS Cover Sheet

08/16/2017 V1

Please complete this cover sheet for all cases of Vibriosis in addition to CDC's Cholera and other Vibrio Illness Surveillance (COVIS) Report. Please submit completed form to DSHS Central Office by fax (512-776-7616) or secure email (FOODBORNETEXAS@dshs.texas.gov)

**STATUS:**  CONFIRMED  PROBABLE: CIDT  PROBABLE: (EPI-LINKED NBS ID: \_\_\_\_\_)  NOT A CASE

**Patient Information:**  
Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_  
County: \_\_\_\_\_ Zip: \_\_\_\_\_  
Phone: (\_\_\_\_) \_\_\_\_\_  
Age: \_\_\_\_\_  
 Male  Female  Unknown  
Onset date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Symptomatic?  Yes  No  Unknown  
Diagnosed?  Yes  No  Unknown

**Reporting Information:**  
Date reported to Public Health: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Reported by: \_\_\_\_\_  
Phone: (\_\_\_\_) \_\_\_\_\_  
Investigated by: \_\_\_\_\_  
Agency: \_\_\_\_\_  
Phone: (\_\_\_\_) \_\_\_\_\_  
Email: \_\_\_\_\_  
Investigation Start Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Date Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_

Number of COVIS Interview Attempts	Day	Date	Time	Interviewer	Comments
1	M	7/26/16	3:30pm	JB	Requested to call back on Tuesday at 7:00pm

Fax to DSHS Central Office: 512-776-7616

SHS Central Office only:  NBS approved  Partial  LTF  
COVIS received: \_\_\_\_/\_\_\_\_/\_\_\_\_  Completed  Partial  LTF  
COVIS sent to CDC: \_\_\_\_/\_\_\_\_/\_\_\_\_ If applicable, COVIS sent to FDA/DSHS Seafood Safety Group: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Oyster tags sent to FDA/DSHS Seafood Safety Group: \_\_\_\_/\_\_\_\_/\_\_\_\_

Exposure:  Shellfish  Water Contact  Other/Unknown

Please remove this page before submitting COVIS Report to CDC

# *Vibrio* Reporting, cont...



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- *Vibrio* infection became nationally notifiable in 2007, but Gulf Coast states have been reporting *Vibrio* to CDC since 1988
- National Shellfish Sanitation Program (NSSP)
- FDA and DSHS Seafood Aquatic Life group partnership



# Quality Assurance, Shellfish tags



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- Shellfish tags should be attached until container with oysters is empty
- Thereafter, should be kept on file for 90 days

	DEALER NAME _____ CERT. NO. _____
	Dealer Address _____
	City, State Zip Code _____
	ORIGINAL SHIPPER'S CERT. NO. IF OTHER THAN ABOVE: _____
	HARVEST DATE: _____
	HARVEST LOCATION: _____
	TYPE OF SHELLFISH: _____
QUANTITY OF SHELLFISH: _____	
<b>THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY AND THEREAFTER KEPT ON FILE FOR 90 DAYS.</b>	

**RETAILERS, INFORM YOUR CUSTOMERS**  
Thoroughly cooking foods of animal origin such as beef, eggs, fish, lamb, poultry, or shellfish reduces the risk of foodborne illness. Individuals with certain health conditions may be at higher risk if these foods are consumed raw or undercooked. Consult your physician or public health official for further information.

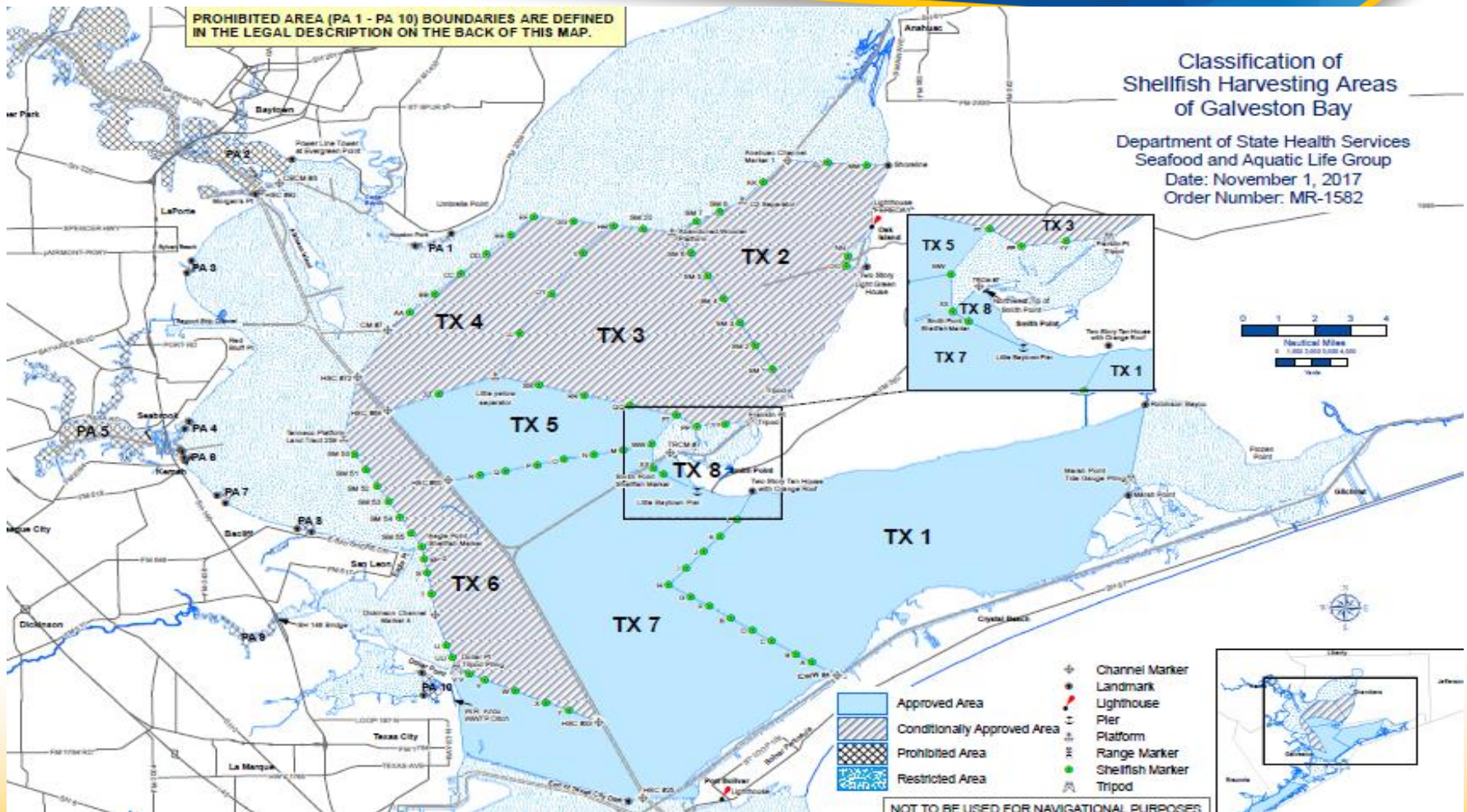


# Seafood and Aquatic Group, DSHS Shellfish Harvesting Areas maps



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# *Vibrio* Infections in Texas, 2008-2017



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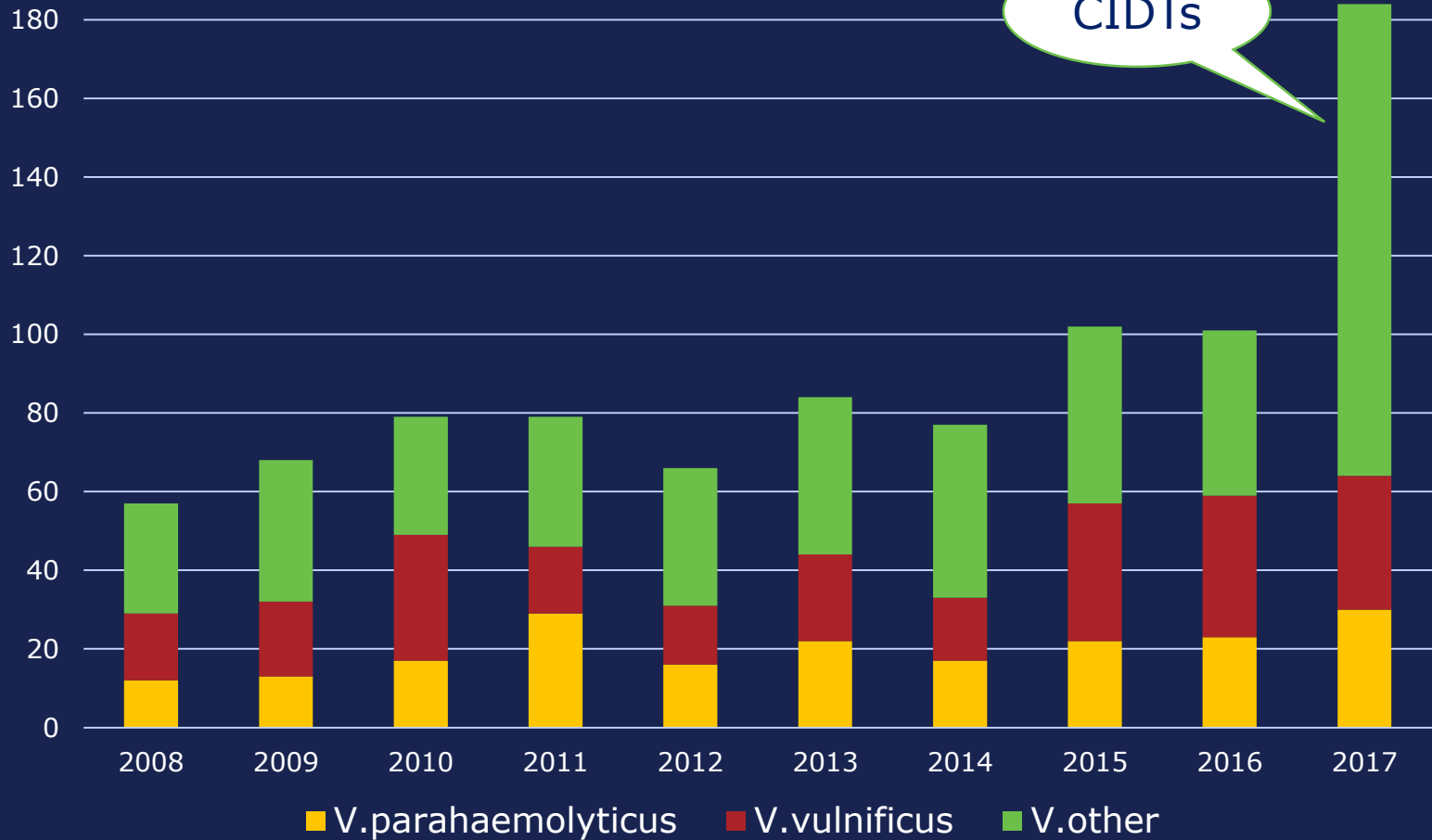
- 897 cases (2008-2017)
- 90 cases per year, on average:
  - 57 in 2008
  - 183 in 2017
- Male – **70%**
- *V. parahaemolyticus* – 22.4%
- *V. vulnificus* – 27.1%
- *V. other* – 50.5%
  - *V. alginolyticus* – 37.5%
  - *V. cholera non-O1* – 24.9%
  - *V. fluvialis* – 8.9%

# Reported *Vibrio* Cases by Species in Texas, 2008-2017 (n=897)



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**Total (2008-2017):** V.p. - 22.4%; V.v. - 27.1%; V.other - 50.5%



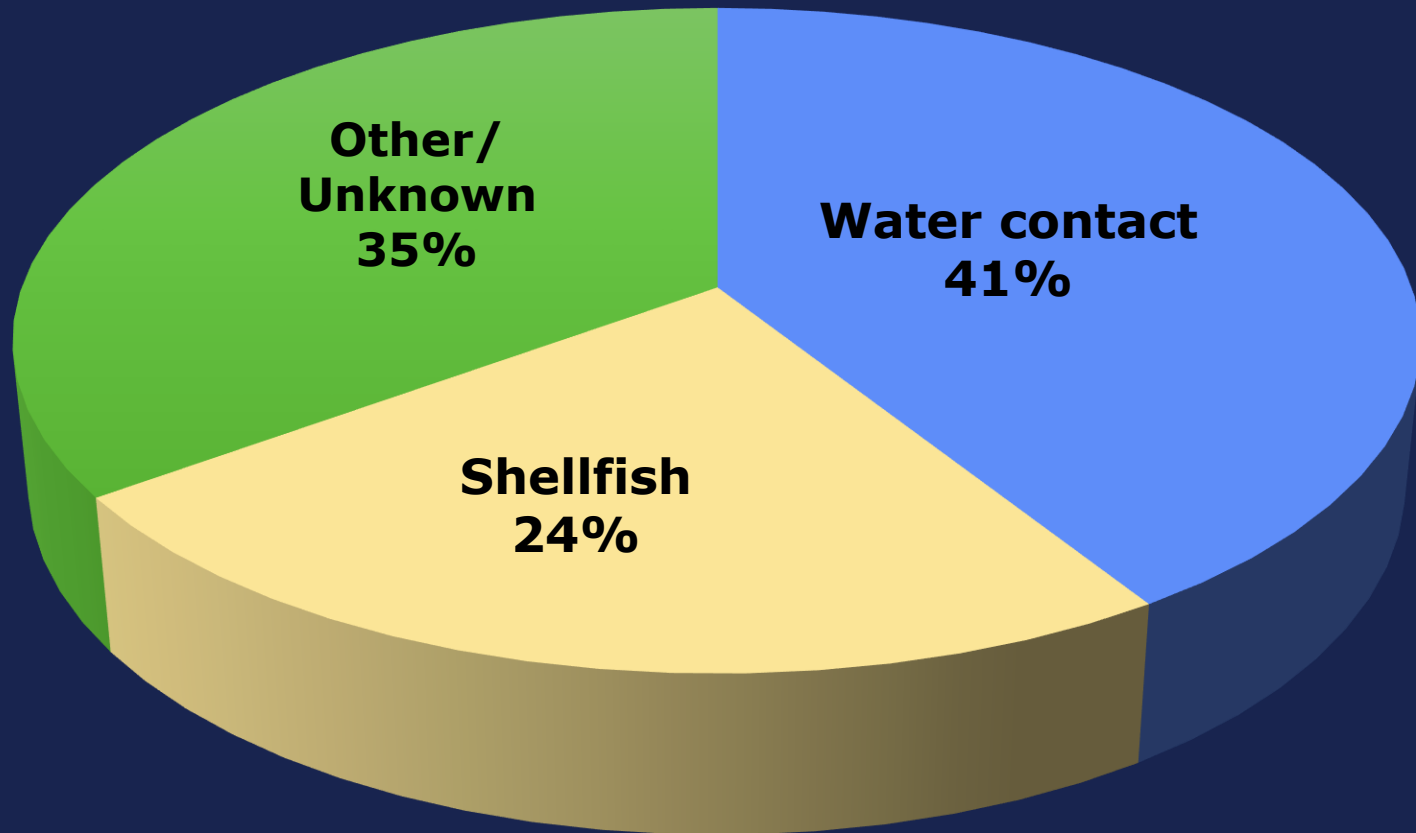
# Reported *Vibrio* Cases by Exposure in Texas, 2008-2017



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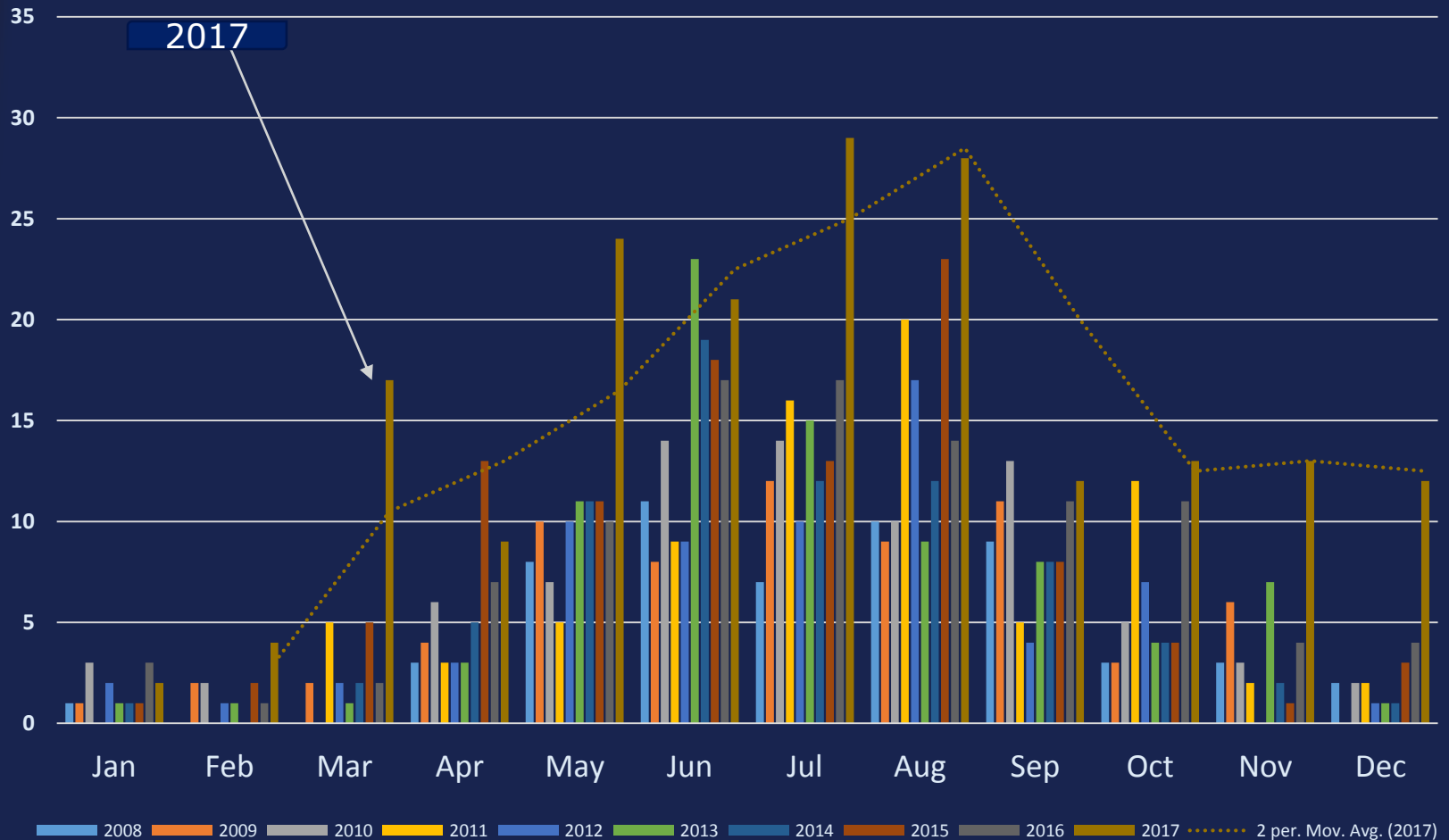


# Reported *Vibrio* Cases by Month in Texas, 2008-2017



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# Reported *Vibrio* Infection Deaths in Texas, 2008-2017

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## □ 66 deaths

- Health status: alcoholism, cirrhosis, diabetes, cancer

- ❖ *V. vulnificus* – 86%

- ❖ *V. parahaemolyticus* – 3%

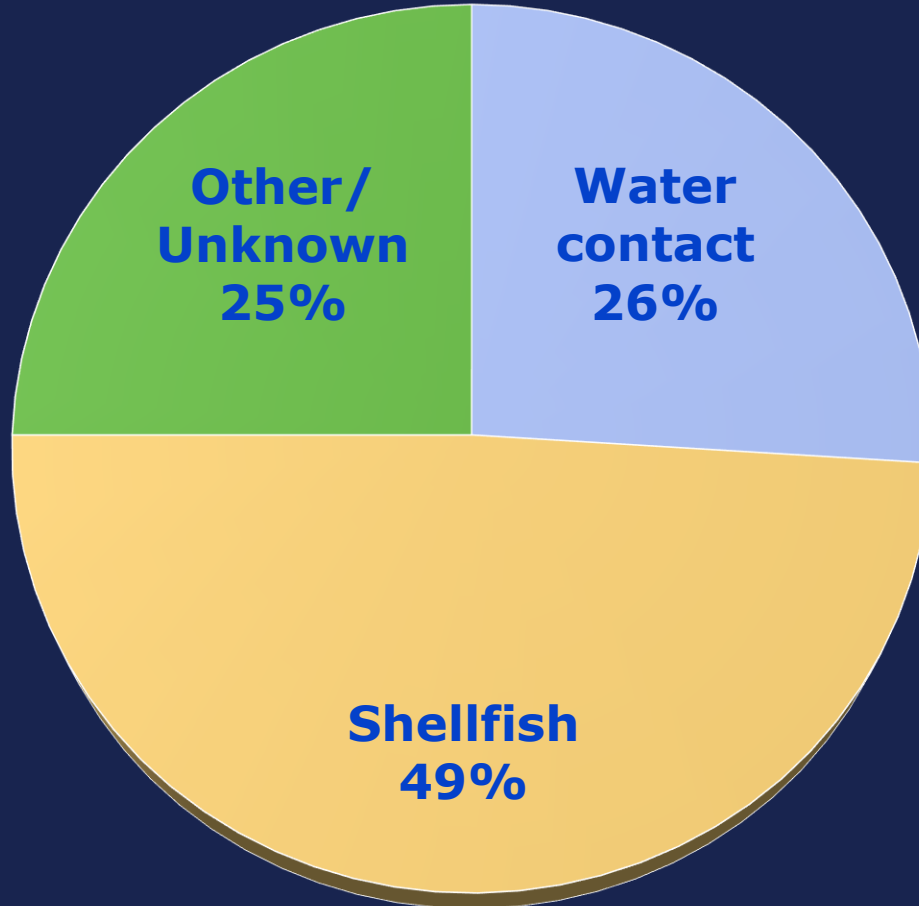
- ❖ *V. other* – 11% (*V. cholera* non-O1)



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# Reported *V.vulnificus* Deaths by Exposure in Texas, 2008-2017 (n=66)



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# Cases of Interest 2017



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# Case #1.

## *V. vulnificus*, (Crab bite)



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- 80yo, female
- Bitten by live crab (R arm) at seafood market: 06/17/17
  - Ate cooked oysters:06/18/17
- Symptoms onset: 6/18/17
- Necrotizing fasciitis
- No GI symptoms
- Hospitalization:06/19/2017
- *V. vulnificus* (wound, R arm):06/20/17
- Death: 06/20/17
- Underlying condition: heart disease





# Case #2.

## *V. vulnificus*, (pedicure)



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- 56yo, female
  - Ate raw oysters: 08/05/17
  - Pedicure (feet massage): 08/06/17 (2pm)
  - Walk on the beach (Biloxi, MS): 08/06/17
  - Symptoms (ache, feet) 08/06/17 (5pm) later night pain progressed in calves
  - No GI symptoms
  - Hospitalization: 08/07/2017
  - *V. vulnificus* (wound), date
- collected: 08/07/17
  - **Necrotizing fasciitis.** Cellulitis, bullae (Bil.LE)
  - Amputation (bilateral LE)
  - Death – 08/10/17
  - Underlying condition: myelogenous leukemia, stem cell transplantation, liver disease

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# Hurricane Harvey and *Vibrio* Infections in Texas, 2017



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- 3 reported confirmed *Vibrio* cases (+1 OOS case) linked to HH & post-hurricane flooding, clean up in TX



# Case #1, *V. vulnificus*, Rescue case, Hurricane Harvey



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- 74yo, male, Aransas Co
- Search & rescue team found him on **08/29/17**
- Muscle pain, cellulitis (left foot), septic shock, acute kidney injury
- Onset date unk (pt. was non-verbal)
- *V. vulnificus* (blood), -08/29/17
  - ❖ +*Klebsiella pneumonia*
- Amputation, left leg below the knee
- Discharged **09/14/17** to LTC facility
- Underlying conditions: cancer, alcoholism

# *Vibrio* & Hurricane Harvey, cont...



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## Case #2

- *V. vulnificus*
  - 65yo male, Calhoun Co
  - 08/26/17 – evacuated to Rockwall, TX (RV park)
  - 08/31/17 – returned home & began to clean up his property. Injured leg. Went to fishing.
  - 09/04/17 – fever, pain, swelling in injured leg.
  - Underlying conditions: hypertension

## Case #3

- *V. parahaemolyticus*
  - 11yo male, Houston
  - 09/16/17 - Fell off on backyard w/stagnant water, injured knee
  - 09/18/2017 – date collection (wound)
  - Underlying conditions: none



# Vibrio & Hurricane Harvey, Cont...



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- Case #4 (OOS), *V. vulnificus*
  - ❖ 55yo male, MS resident
  - ❖ Helped with post HH clean up (Galveston Co) since 09/01/17
  - ❖ 09/21/2017 – developed severe sunburn, wound
  - ❖ Hospitalized, survived, no sequelae
  - ❖ Underlying conditions: none





# Vibrio Prevention: Shellfish Exposure



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- Cook shellfish
- Do not eat shellfish that do not open during cooking
- Shellfish in the shell, - boil until the shell open and cont...for 5 min
- Shucked oysters, - boil at least 3 min or fry at least 10 min.
- Immediately refrigerate leftover (eat refrigerated cooked left over within 2 days)
- Avoid cross contamination!
- Wear gloves while handling raw shellfish



**DON'T EAT RAW  
OYSTERS!**



# Vibrio Prevention: Water exposure



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- Avoid marine, salty, brackish water if you have a pre-existing wound
- Wear protective water shoes while fishing, walking in water, etc.
- If you sustain a wound/injury while exposed to salty seawater or handling raw seafood, - wash, clean, and disinfect area immediately and seek medical help if the area becomes inflamed.



**Pre-existing  
wounds**

# DSHS Vibrio Infection Web Page

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## ***Vibrio* infection information, data, reporting**

- <https://www.dshs.texas.gov/idcu/disease/vibrio/default/>  
(Google "DSHS Vibrio")



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# Thank you!

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