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

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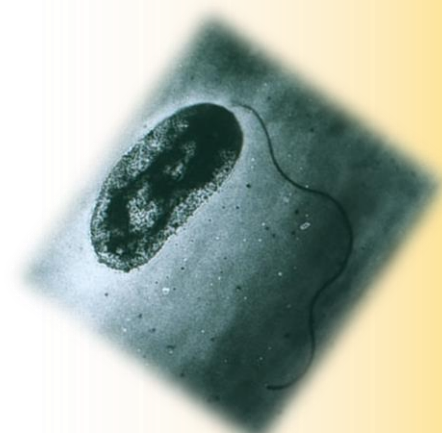
Vibrio Infection

- 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 ($>15^{\circ}\text{C}$) water
- Seasonal, May-October
- 80,000 illnesses and 100 deaths in the USA every year



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Vibrio infection: Symptoms

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



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



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- 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

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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)

NBS Patient ID _____
NBS CAS ID _____

STATUS: ☐ CONFIRMED ☐ PROBABLE: CIDT ☐ PROBABLE: (EPI-LINKED NBS ID: _____) ☐ NOT A CASE

Patient's name: Last _____ First _____
Address: _____
County: _____ Zip: _____
Phone: (____) _____
Age: _____
☐ Male ☐ Female ☐ Unknown
Symptom Onset date: ____/____/____
Symptoms: ☐ Yes ☐ No ☐ Unknown
Diagnosed? ☐ Yes ☐ No ☐ Unknown

Date reported to Public Health: ____/____/____
Reported by: _____
Phone: (____) _____
Investigated by: _____
Agency: _____
Phone: (____) _____
Email: _____
Investigation Start Date: ____/____/____
Date Completed: ____/____/____

Log of COVIS Interview Attempts:			Interviewer	Comments
Attempts	Day	Date	Time	
1st	Mo	7/26/16	3:30pm	
2nd				
3rd				
4th				
5th				
6th				
7th				
8th				
9th				
10th				

SHS Central Office only: ☐ NBS approved ☐ Partial ☐ LTF
COVIS received: ____/____/____
COVIS sent to CDC: ____/____/____
If applicable, COVIS sent to FDA/DSHS Seafood Safety Group: ____/____/____
Oyster tags sent to FDA/DSHS Seafood Safety Group: ____/____/____
Case track information entered on line list: ____/____/____
Other/Unknown: ____/____/____
Fax to DSHS Central Office: 512-776-7616
Please review 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: _____	
THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY AND THEREAFTER KEPT ON FILE FOR 90 DAYS.		

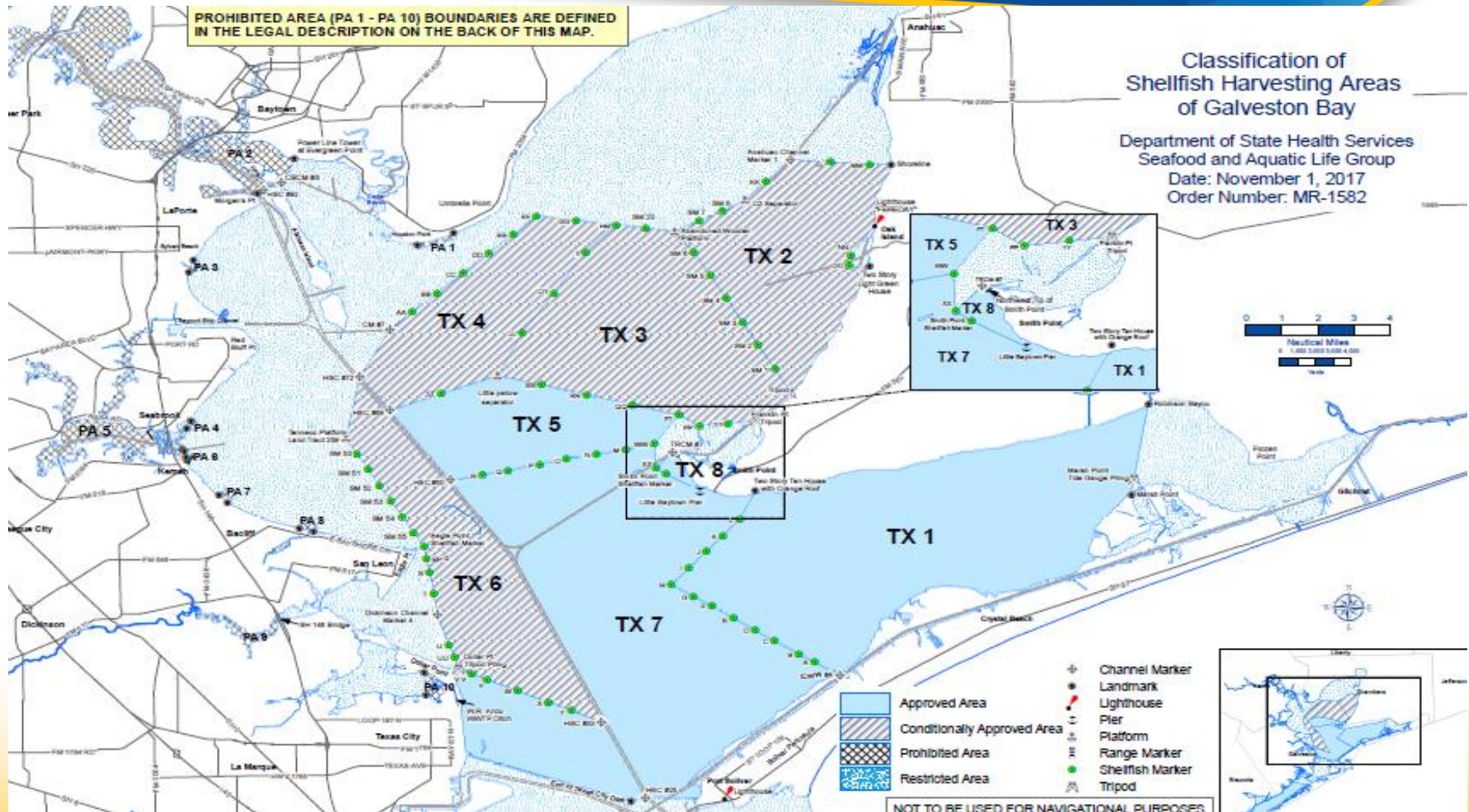
RETAILERS, INFORM YOUR CUSTOMERS
Thoroughly cooking foods of animal origin such as beef, eggs, fish, lamb, poultry, or shellfish reduces the risk of foodborne illness. Individuals with certain health conditions may be at higher risk if these foods are consumed raw or undercooked. Consult your physician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



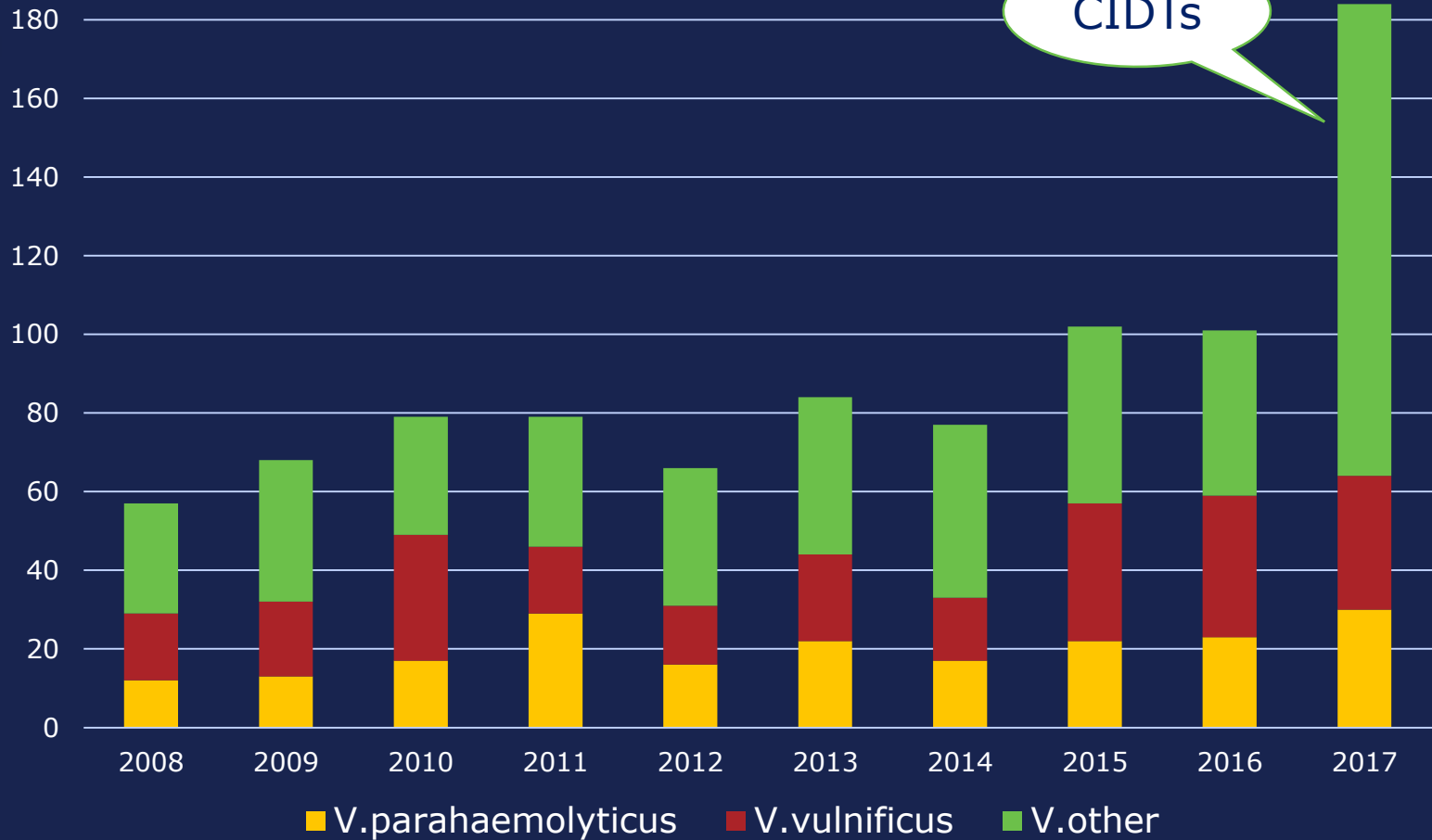
Reported *Vibrio* Cases by Species in Texas, 2008-2017 (n=897)



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

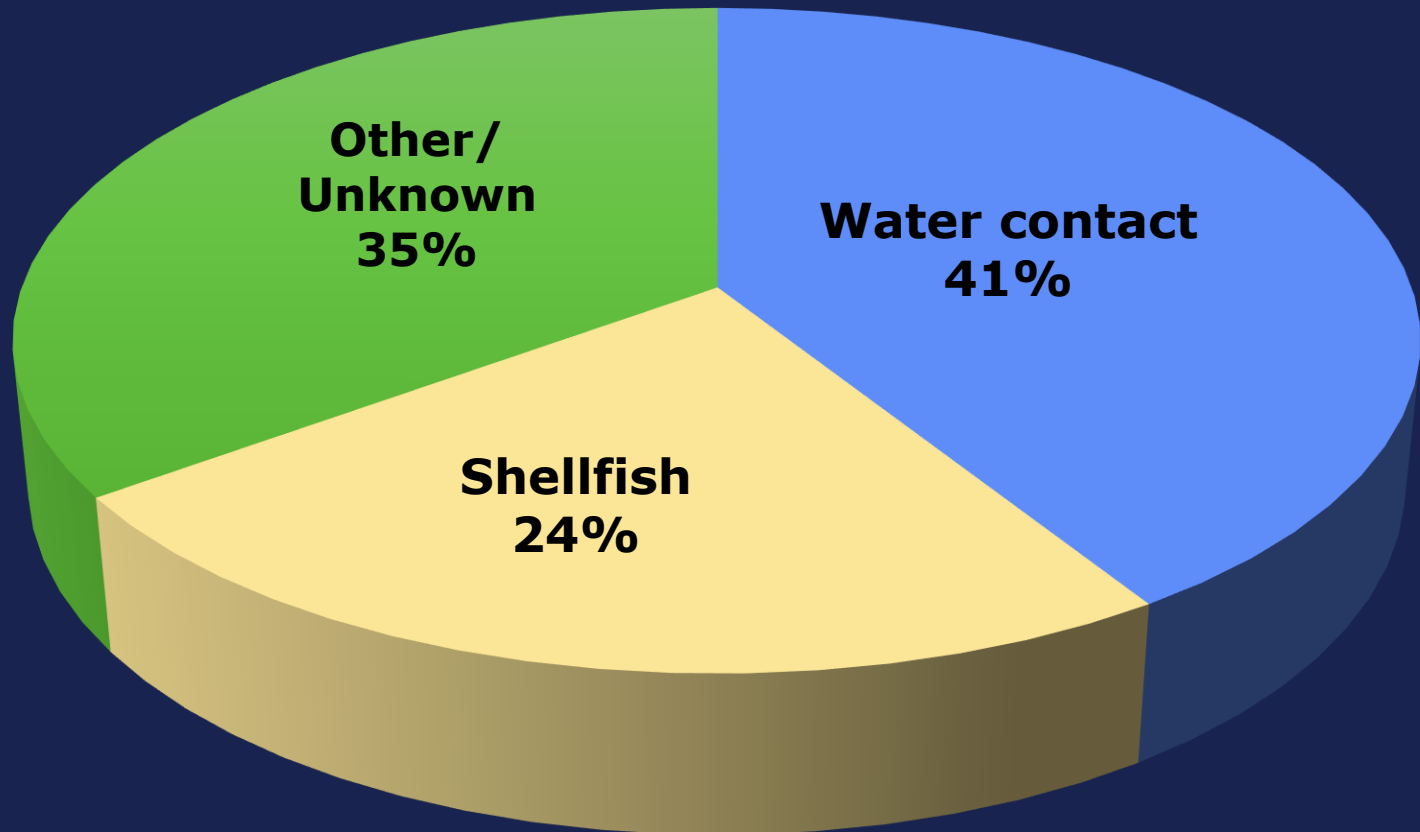
Reported *Vibrio* Cases by Exposure in Texas, 2008-2017



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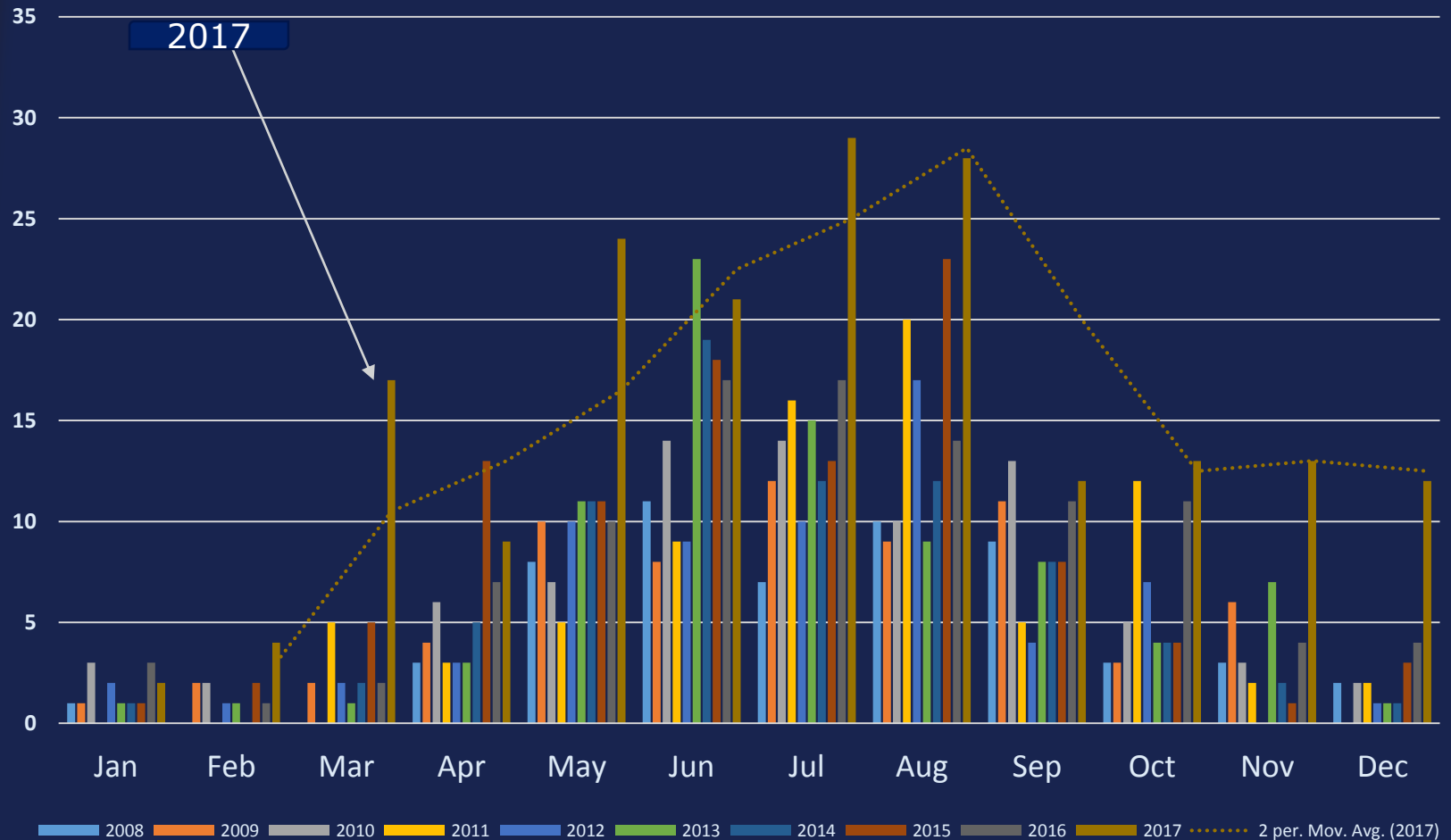
Reported *Vibrio* Cases by Month in Texas, 2008-2017



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

□ 66 deaths

- Health status: alcoholism, cirrhosis, diabetes, cancer

❖ *V. vulnificus* – 86%

❖ *V. parahaemolyticus* – 3%

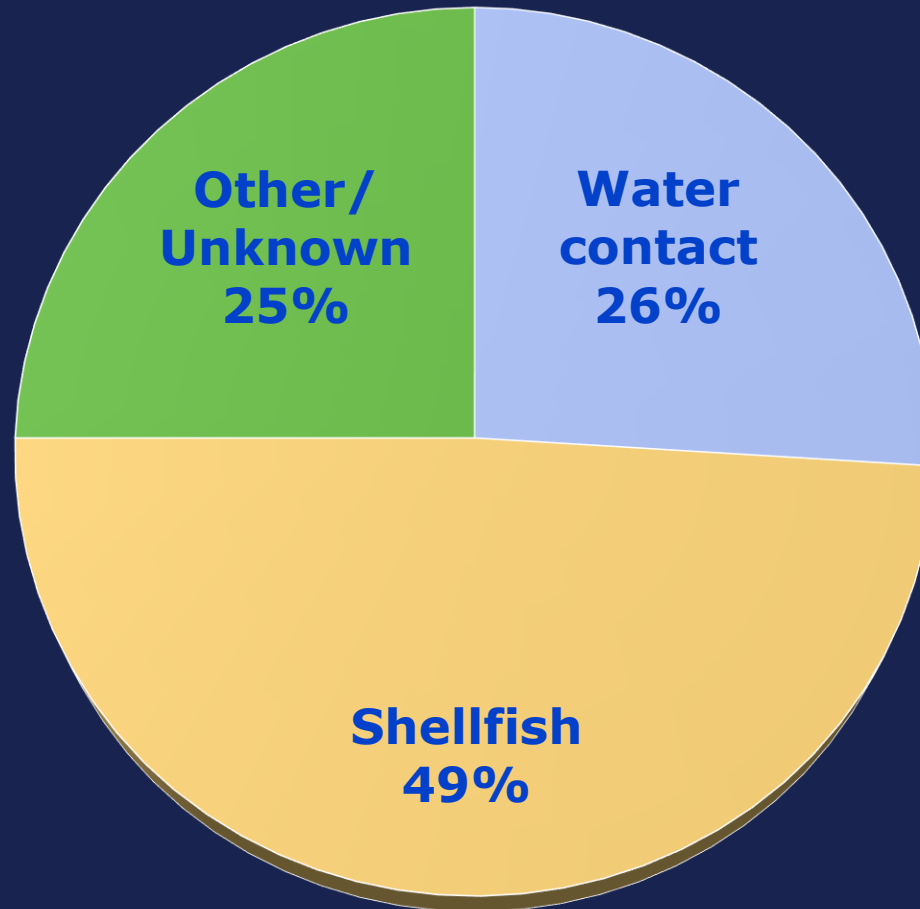
❖ *V. other* – 11% (*V. cholera* non-O1)



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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

***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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