



Background/ Health Issue

Vibrio Background

- Vibrio* are bacteria that are naturally found in salty/ brackish coastal waters.
 - These bacteria thrive in warm waters
- Different species can cause vibriosis (a human infection)
 - Most common species in the U.S. include *V. parahaemolyticus*, *V. vulnificus*, *V. alginolyticus*
 - Some species of *Vibrio* cause cholera

Vibriosis Infection

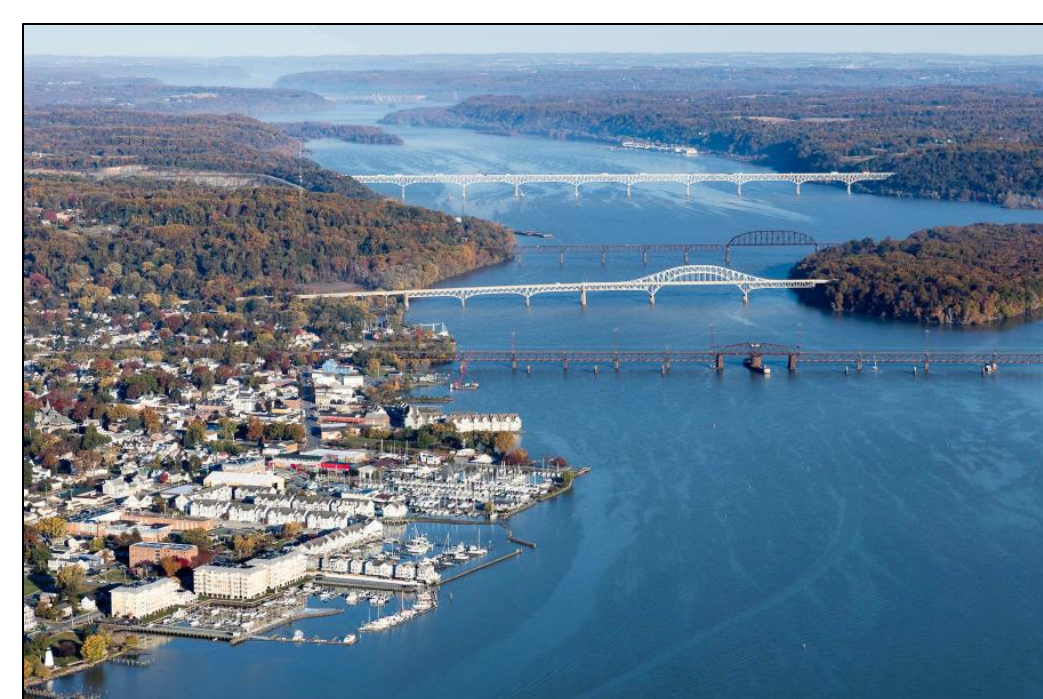
- Caused by *Vibrio* bacteria entering the body by:
 - Consuming raw or undercooked shellfish, particularly oysters
 - Having an open wound exposed to salt or brackish waters
- Three types of infection: gastrointestinal, wound, and blood

Populations at risk

- Anyone can get vibriosis, but it is more common in immunocompromised people

Health Burden

- CDC estimates that 80,000 cases of vibriosis happen annually in the US
- 52,000 cases of vibriosis are caused by eating contaminated food



Projects Undertaken

- Input historic patient identifiers between 2000-2023 into REDCap vibriosis repository
- Input case report data into REDCap for 2023 and 2024 cases



- Created demographic, spatial, temporal, and exposure trend visualizations and conducted statistical analyses to extrapolate significant trends for the 2000-2023 data using Rstudio



- Created a slideshow of data trends to present at DSI all hands meeting
- Participated in a restaurant inspection with Richmond City Health Department, Environmental Health

Project Outputs

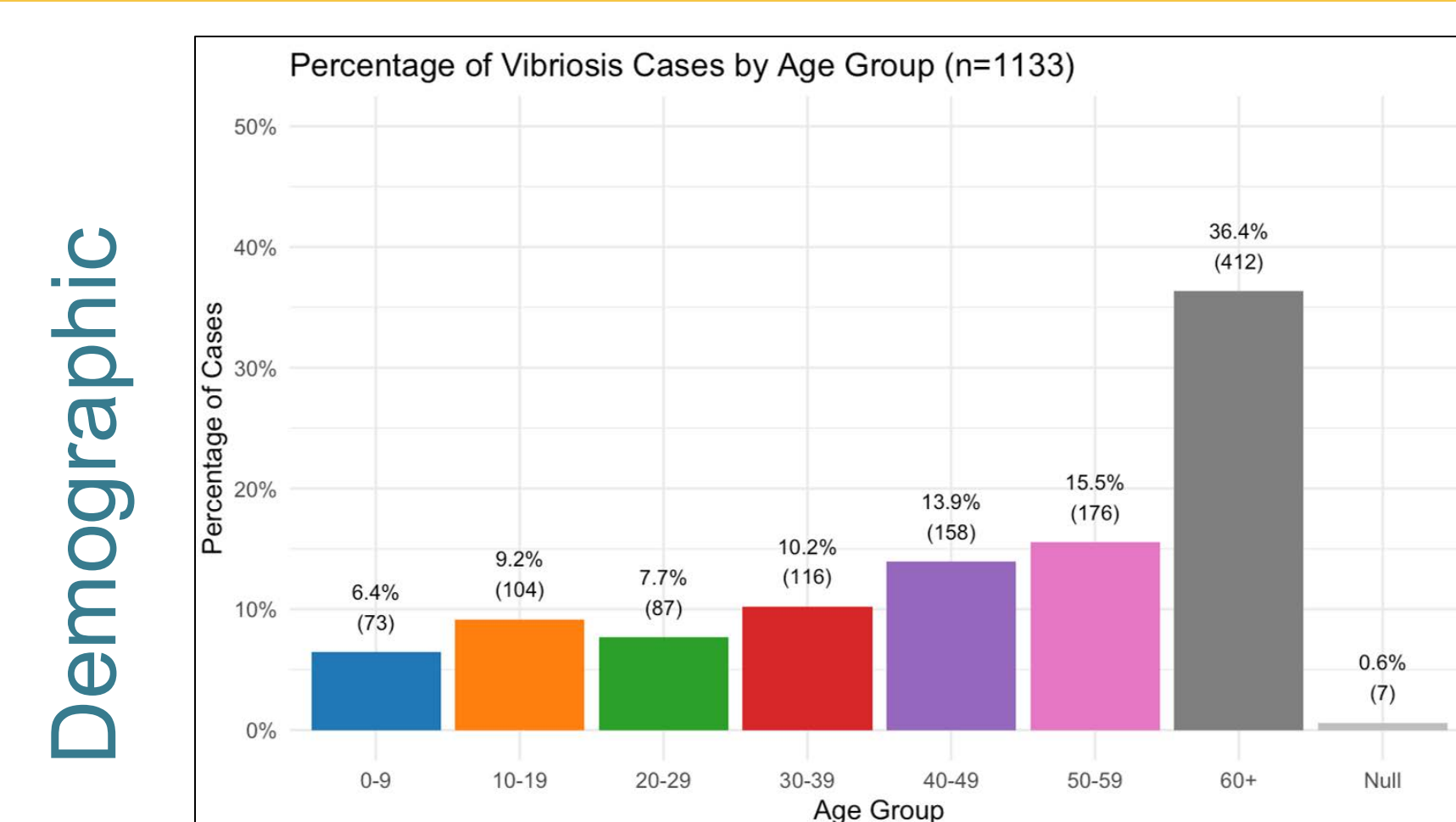


Figure 1. The 60+ age group had the highest proportion of cases. Percentage of vibriosis cases by age group (n = 1,133). Bars represent the percentage of total cases in each age group, with raw counts shown in parentheses. A "Null" category is included for cases with unavailable age data.

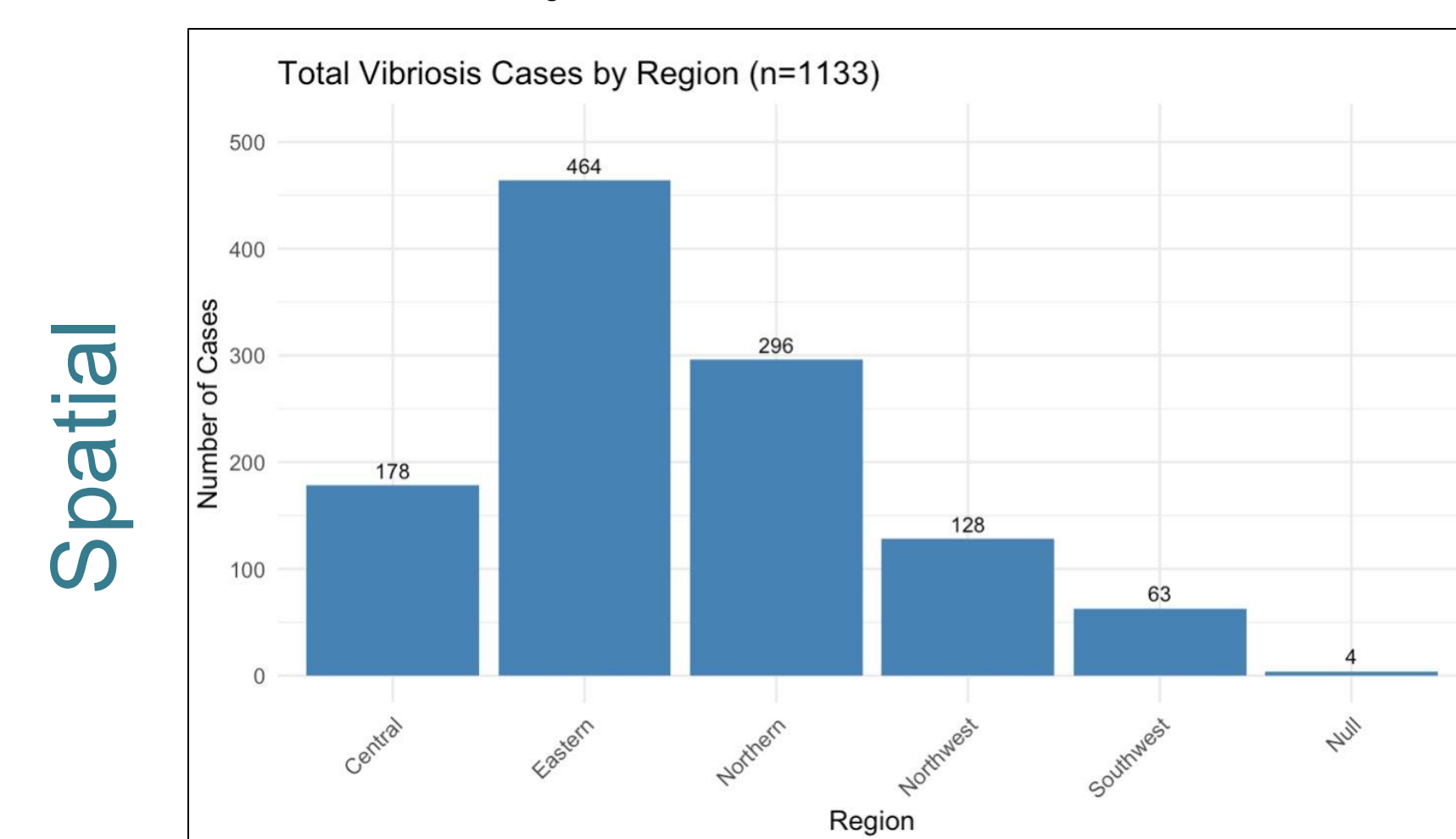


Figure 2. The Eastern region had the highest number of cases. Number of vibriosis cases by region (n = 1,133). Bars represent the number of total cases in each region. A "Null" category is included for cases with unavailable age data.

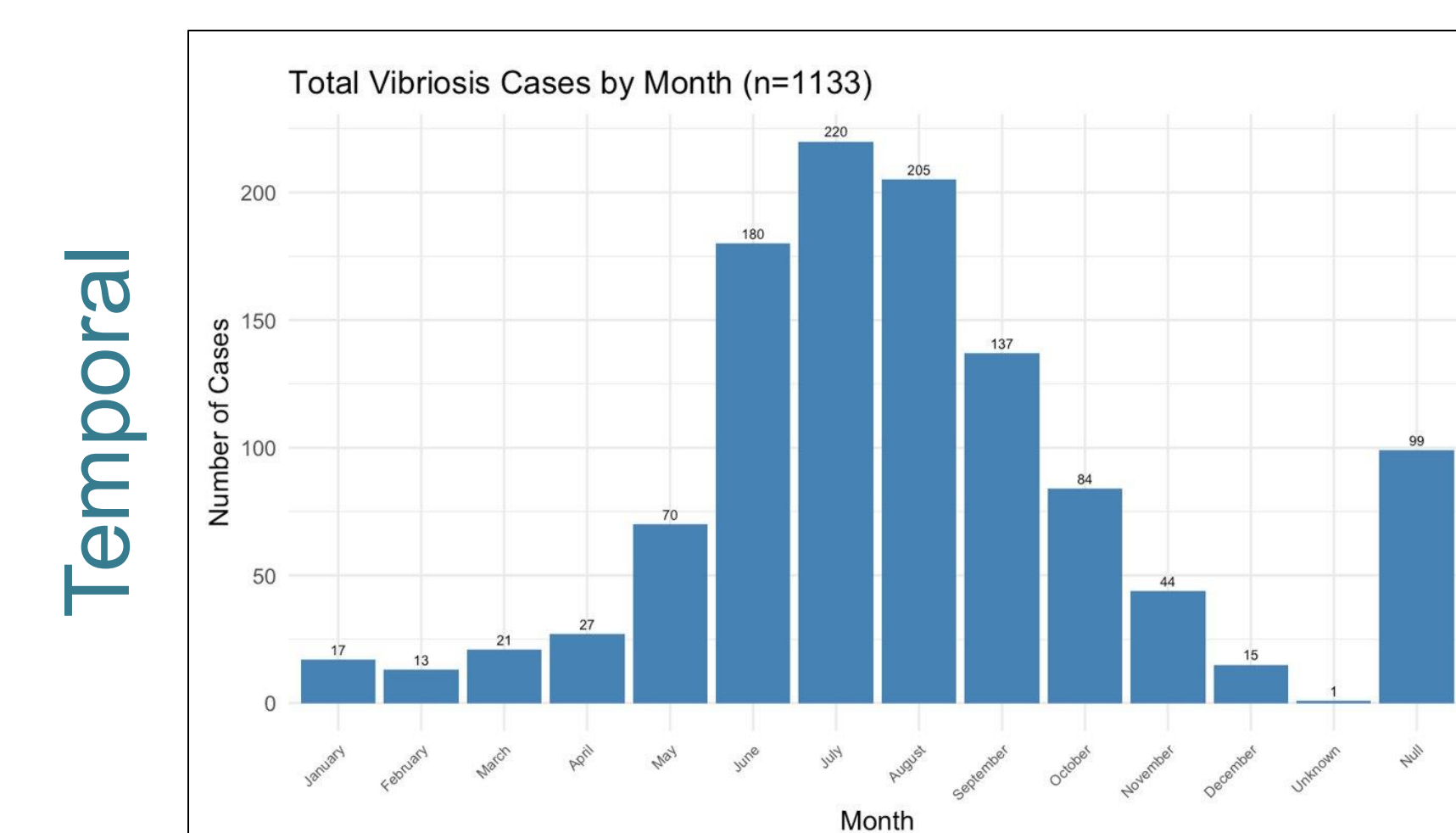


Figure 3. The summer months (Jul-Aug) had the highest number of cases. Number of vibriosis cases by month (n = 1,133). Bars represent the number of total cases in each month. A "Null" category is included for cases with unavailable age data.

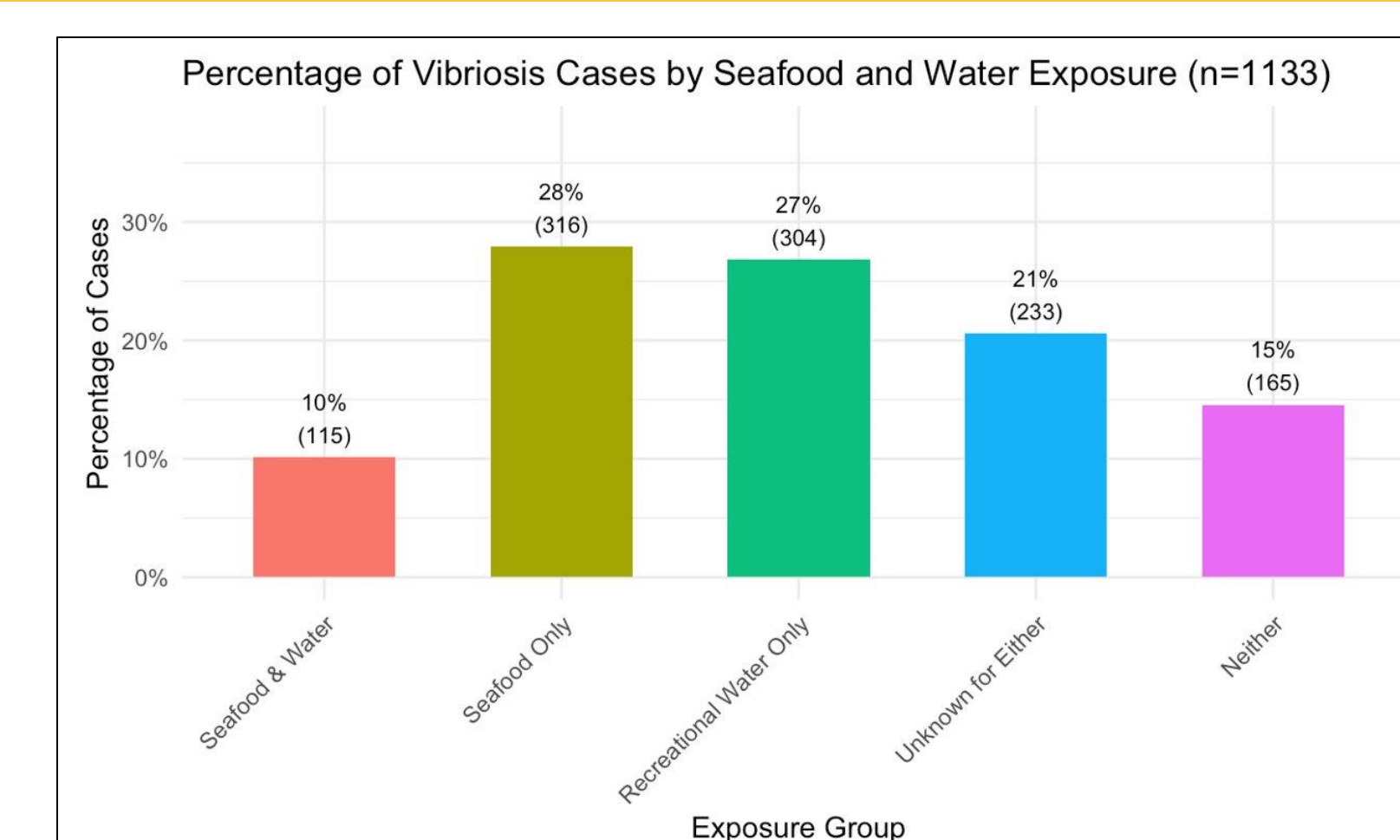


Figure 4. The seafood only exposure had the highest proportion of cases. Percentage of vibriosis cases by exposure (n = 1,133). Bars represent the percentage of total cases in each exposure group, with raw counts shown in parentheses. A "Null" category is included for cases with unavailable age data.

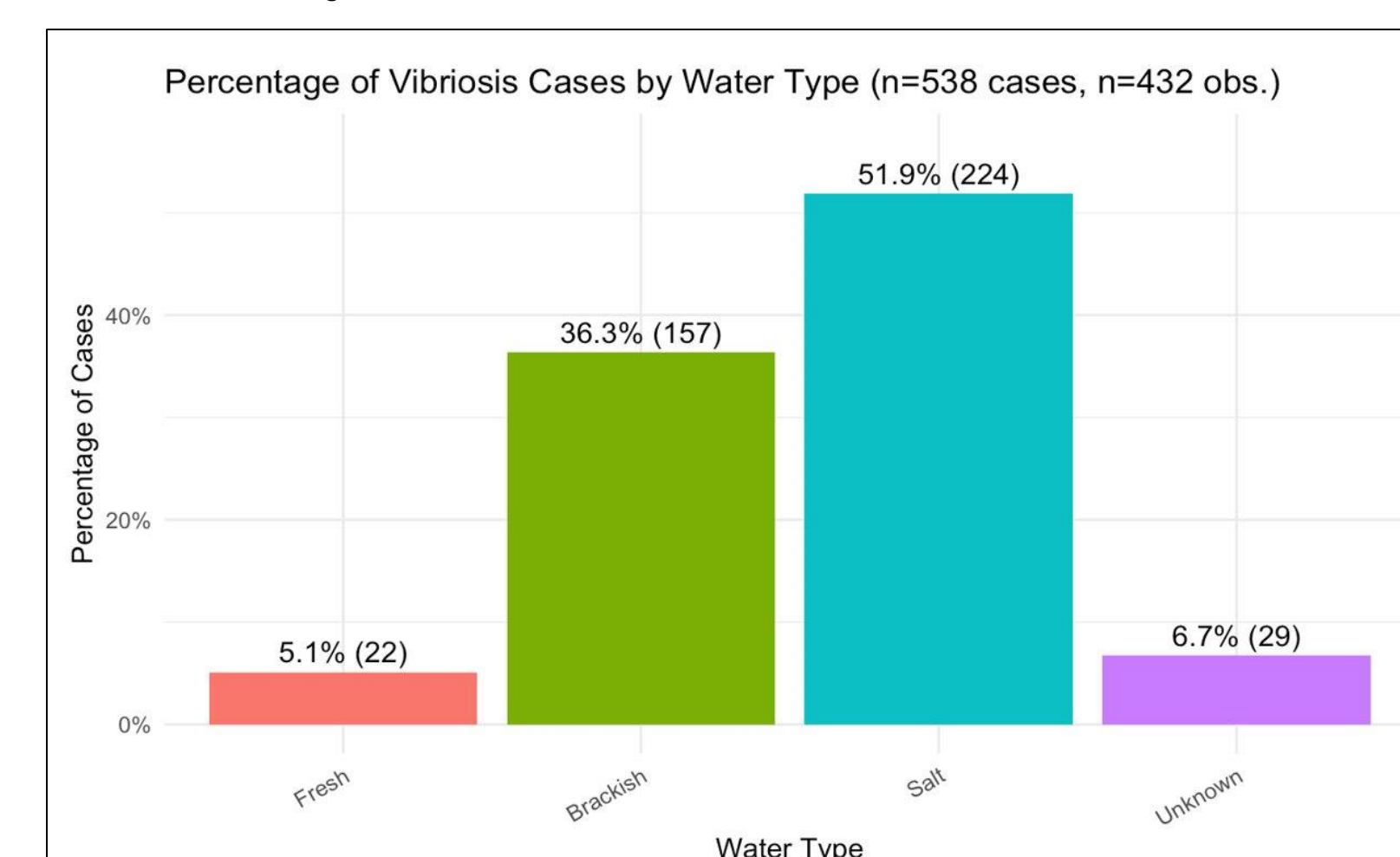


Figure 5. Salt water type had the highest proportion of cases. Percentage of vibriosis cases by water type exposure (n = 538 cases ("yes" and "unknown" water exposures only), with 432 observations). Bars represent the percentage of total cases in each exposure group, with raw counts shown in parentheses.

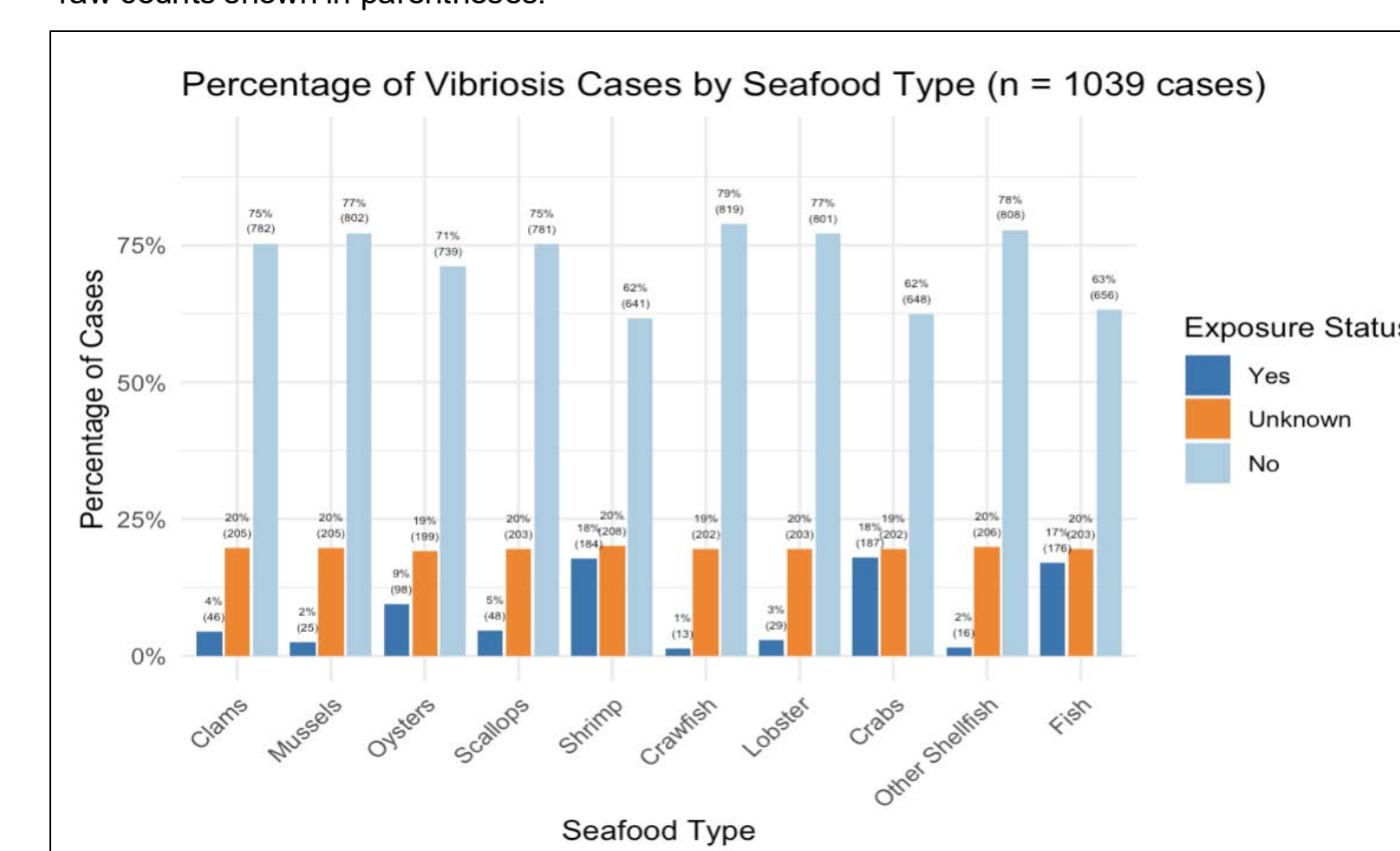


Figure 6. Shrimp and Crabs have the highest proportion of cases. Percentage of vibriosis cases by seafood type (n = 1039 cases (excludes "null")). Bars represent the percentage of total cases in each exposure group, with raw counts shown in parentheses.

Exposures

Additional Findings/ Conclusions

Demographic: Men, aged 60+, white race, and those of unknown ethnicity had the highest number of cases. 60+ populations are more likely to be immunocompromised, and therefore have a higher risk of infection.

Spatial: Eastern & Northern regions had higher cases, potentially due to proximity to coastal waters and consumption of raw oysters.

Temporal: Increase in cases since 2000, peaking in 2023 potentially due to climate change warming coastal waters; higher cases in summer months (June-Aug) due to the bacteria thriving in warmer waters.

Seafood Exposure: Most cases only had seafood exposure, with raw oysters being consumed the most.

Recreational Water Exposure: Most cases involved no wound exposure (seafood only exposure), while the second most common had recent wounds, a risk factor for vibriosis. The highest number of cases occurred in the Eastern region water bodies, particularly in salt or brackish waters where *Vibrio* naturally occurs.

Notable Experiences

Team Meetings

- VA Rapid Response Team (RRT) weekly meetings
- Weekly Foodborne Disease Epidemiology Team Meetings
- VDH All-Epidemiologist Meeting at the Monroe Building, Central Office
- Division of Surveillance and Investigation (DSI) staff meeting

Monthly Meetings

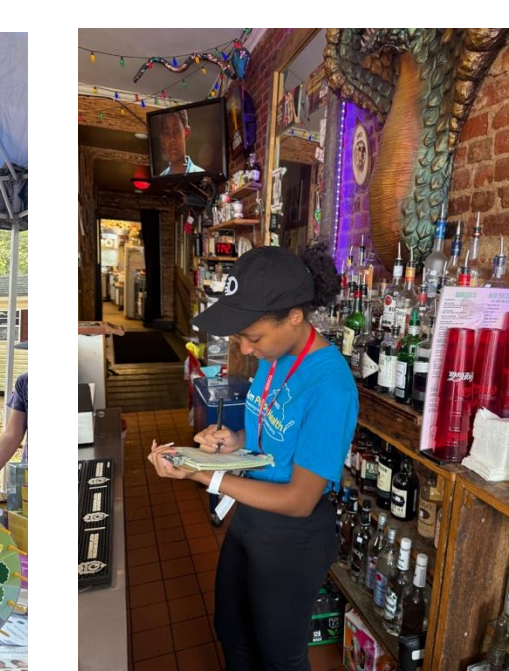
- Monthly Statewide Epi Calls
- Genomic Epidemiology Monthly Seminars
- DSI Investigation Team Biweekly Meetings
- Foodborne Disease Epidemiology Team (FDET) /DCLS Monthly Meetings

CDC Meetings

- Foodborne Outbreaks Response multistate calls (with CDC)
- Monthly OutbreakNet Enhanced Calls
- Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) Quarterly Webinar (CDC)

Trainings

- Advanced Genomic Epi Training
- Restaurant inspection with Richmond City Environmental Health



Challenges

Incomplete exposures:

Those interviewed sometimes had poor recall of exposures, which resulted in "unknowns" and "nulls" into the data

Loss to Follow up:

Some cases were loss to follow up, and therefore their full case history was unavailable

Lack of Controls:

To conduct stronger tests, the entire population data including controls (not cases) are needed as only case series data (only cases) are available

Acknowledgements

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