Vibrio Fact Sheet

What are Vibrio?

Vibrio are naturally occurring marine bacteria that are found in most aquatic environments. Some species of this bacterial group are known to cause human illness.

Which species are harmful to humans?

There are three primary species associated with human illness: *Vibrio parahaemolyticus, V. vulnificus and V. cholerae.* However, not all strains of these species are pathogenic. Several other species have also been associated with illness, either at a lower frequency or with less conclusive evidence: *V. alginolyticus, V. carchariae, V. cincinnatiensis, V. albensis, V. fluvialis, V. furnissii, V. hollisae, V. metschnikovii,* and *V. mimicus.*

What types of illness can occur?

There are three distinct syndromes that can occur from *Vibrio* infections: gastrointestinal illness, septicaemic infection, and wound infections. The latter is not associated with consumption of seafood.

What outbreaks have occurred?

- Illnesses associated with *Vibrio* contaminated seafood are rare in Australia.
- In 2016 an outbreak of *V. parahaemolyticus* occurred associated with Tasmanian oysters, resulting in 11 cases across multiple states.
- Since 2016 further small outbreaks of *V. parahaemolyticus* have been reported associated with oysters from WA, SA, NSW and Tasmania. In 2017, an outbreak involving *V. albensis* associated with oysters occurred in NSW with 3 cases.
- A series of two outbreaks of *V. parahaemolyticus* in 2021 have been associated with SA oysters with 21 and 268 illnesses reported respectively.

How much *Vibrio* is a harmful dose?

- Approximately 10^6 cells of *V. cholerae* in healthy adults
- Pathogenicity of *V. parahaemolyticus* varies according to the strain and is not well understood
- The dose of *V. vulnificus* for healthy people is unknown, but in at risk groups (see susceptible individuals below) it may be less than 100 cells.

What are the symptoms of *V. parahaemolyticus* and *V. cholerae* (Non O1/O139) associated with the consumption of seafood?

- Severe gastrointestinal illness including diarrhoea, which can sometimes be bloody, abdominal pains, nausea and vomiting
- Occasional septicaemic infection, only rarely associated with mortality.

What are the symptoms of *V. vulnificus* associated with the consumption of seafood?

- Primary septicaemia with symptoms of fever chills and nausea may occur in susceptible individuals e.g. immuno-compromised and can result in mortality.
- Gastroenteritis, which presents as vomiting, diarrhoea and abdominal pains.

Which seafood can be considered vectors?

- Bivalve shellfish, prawns/shrimp and finfish can all carry *vibrios*

- Recent illness has also been reported in New Zealand in association with abalone, lobster, and urchins.

What increases the risk?

- Consumption of raw or undercooked seafood
- Post-harvest temperature abuse can allow the growth of these pathogens
- People who are immuno-compromised, those who suffer from liver disease and/or have excess levels of iron in the blood serum are at a greatly increased risk of septicaemia.
- In Australia, the prevalence of *Vibrio* species is not well understood, and the relationship with environmental variables has not been explored.

What decreases the risk?

- The Australian Shellfish Quality Assurance Program Operations Manual sets maximum storage temperatures for live bivalves post-harvest to control the growth of indigenous pathogens. Shell stock must be placed under ambient refrigeration at 10 °C or less within 24 hours of harvest or depuration. Under the NSW Shellfish Industry Operations Manual, Sydney Rock Oysters must be stored at 25°C or less within 24 hours of harvest, and at 21°C or less within 72 hours of harvest.
- Industry *vibrio* control plans for at-risk areas include harvest curfews based on temperature, time and/or tide; harvesting from deeper zones; and rapid chilling after harvest.
- *Vibrios* are highly susceptible to heat. Heating to greater than 65°C will inactivate pathogenic strains.
- Depuration is not always effective in removing *Vibrio* from bivalve shellfish.
- Appropriate adherence to regulatory temperature controls is the best preventative measure.

How can we test for *Vibrio*?

- Microbiological analysis using semi-selective media and identification of biochemical phenotypes
- Species specific molecular (Polymerase Chain Reaction) detection direct from enrichment cultures

Regulatory standards

There is no standard set for Vibrio in the Australia New Zealand Food Standards Code or by the Codex Alimentarius Commission. Limits are set by several countries including (but not limited to) Canada, China, India, Japan, Thailand and the United States of America.

Contact us: www.safefish.com.au

Where can I get more information?

Harlock, M., Quinn, S., & Turnbull, A. R. (2022). Emergence of non-choleragenic Vibrio infections in Australia. *Communicable diseases intelligence (2018)*, *46*, 10.33321/10.33321/cdi.2022.46.8. https://doi.org/10.33321/cdi.2022.46.8

SafeFish vibrio webinars. https://www.safefish.com.au/technical-program/vibrio-webinar-series

WHO/FAO (2020). Risk assessment tools for Vibrio parahaemolyticus and Vibrio vulnificus associated with seafood. Microbiological Risk Assessment Series No. 20. Rome: Food and Agricultural Organisation and the World Health Organisation.

WHO/FAO (2011). Risk assessment of Vibrio parahaemolyticus in seafood. Interpretative summary and technical report. Microbiological Risk Assessment Series No. 16. Rome. 193pp

Considering the Benefits and Risks of Seafood Consumption

Eating seafood confers many benefits: it provides top-quality protein, and is an excellent source of important nutrients like iodine, selenium, vitamins A and D, and long-chain polyunsaturated omega-3 fatty acids. However like all foods, some seafood products may contain substances that are harmful to health. Illness from seafood is rare, so the benefits of seafood consumption must be weighed against the risks. For most people, following the national dietary guidelines is the best means of balancing risks and benefits. For some groups such as pregnant women and children, specific advisories on healthy and safe seafood choices should apply. The National Academies Press has published a freely available report on balancing the benefits and risks of Seafood choices, see https://nap.nationalacademies.org/catalog/11762/seafood-choices-balancing-benefits-and-risks.