Vibrio parahaemolyticus – should we be worried and what can we do?

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NSW Oyster Growers Conference

18th June 2022

Acknowledgement of country

In the spirit of reconciliation, the University of Tasmania respectfully acknowledges the Yuin nation. The University also recognises the Aboriginal history and culture of the land and acknowledges and pays respect to the Traditional Owners and to Elders past, present and emerging.

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We have known about Vibrio in Australia shellfish for many years….

1. FRDC 1980-035 Depuration study NSW DPI (Fishing Industry Research Trust Account)
2. FRDC 1982-008 Method development for Vp and Vv CSIRO
3. FRDC 1991-074 Depuration Vv from SRO UNSW
4. FRDC 2002-409 Pathogenic Vp in Aus oysters UTAS
5. FRDC 2005-041 Supply chain assessment of Vibrios UoA
6. FRDC 2007-719 Predicting Vibrio growth in the supply chain UTAS
7. SCRC 2008-730 Codex working group on Vibrio SARDI
8. FRDC 2015-042 Pathogenic vibrio from St Helens SARDI
9. **FRDC 2018-031 Pathogencic vibrio from Tasmania SARDI**
10. **FRDC 2020-043 Toxigenic vibrio in TRO CDU**

Vibrio in seafood causes an estimated 52,000 illnesses per year in USA

Figure 1: Locally-acquired foodborne cases of *V. parahaemolyticus*, in jurisdictions[a] where *Vibrio* infection/*V. parahaemolyticus* is notifiable, by derived diagnosis year,[b] 2005-2020

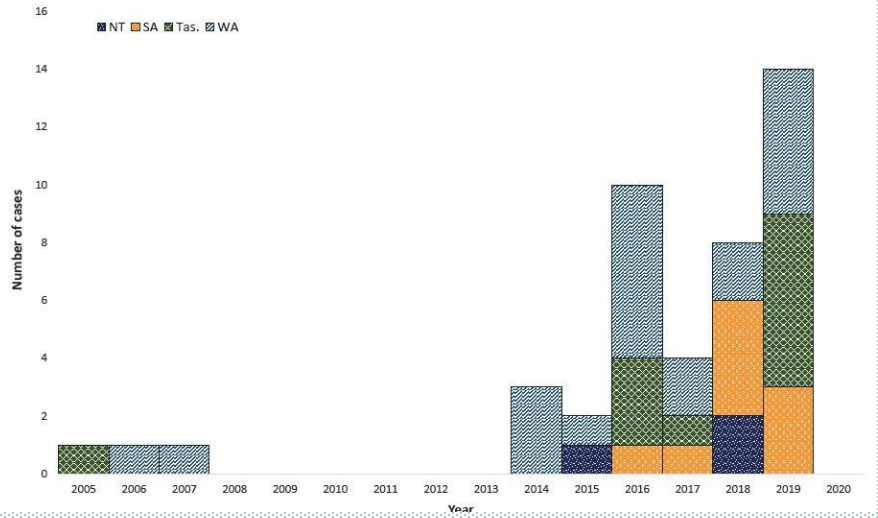


Table 1: Outbreaks of non-cholera vibriosis recorded in Australia with number of cases and total cases where *Vibrio* species were confirmed from clinical specimens, 2002–2019[a]

Year	Jurisdiction reporting outbreak[b]	Cases (number confirmed)	*Vibrio* species	Suspected vehicle	Source jurisdiction[b]
2002	NSW	2 (1)	*V. parahaemolyticus*	Unknown	Unknown
2005	Tas.	2 (1)	*V. parahaemolyticus*	Unknown	Unknown
2016	Tas.[c]	11 (8)	*V. parahaemolyticus*	Oysters	Tas.
2016	WA[c]	9 (9)	*V. parahaemolyticus*	Oysters	SA
2017	NSW	3 (1)	*V. albensis*	Oysters	Tas.

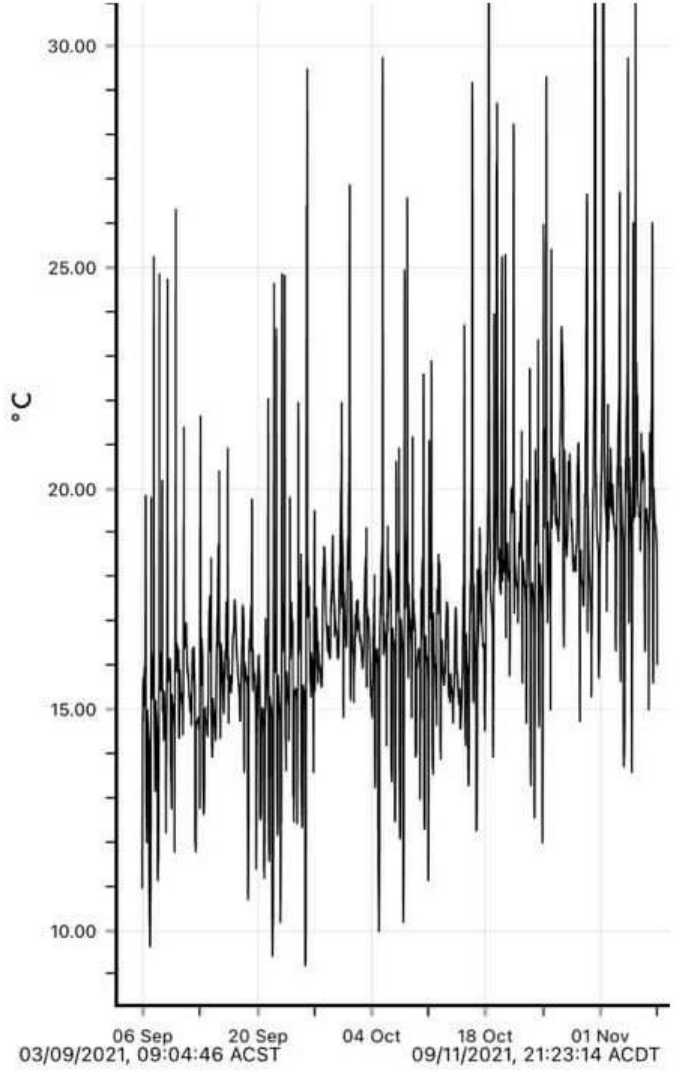
Source: Harlock et al. 2022

But we haven't had a problem until recently

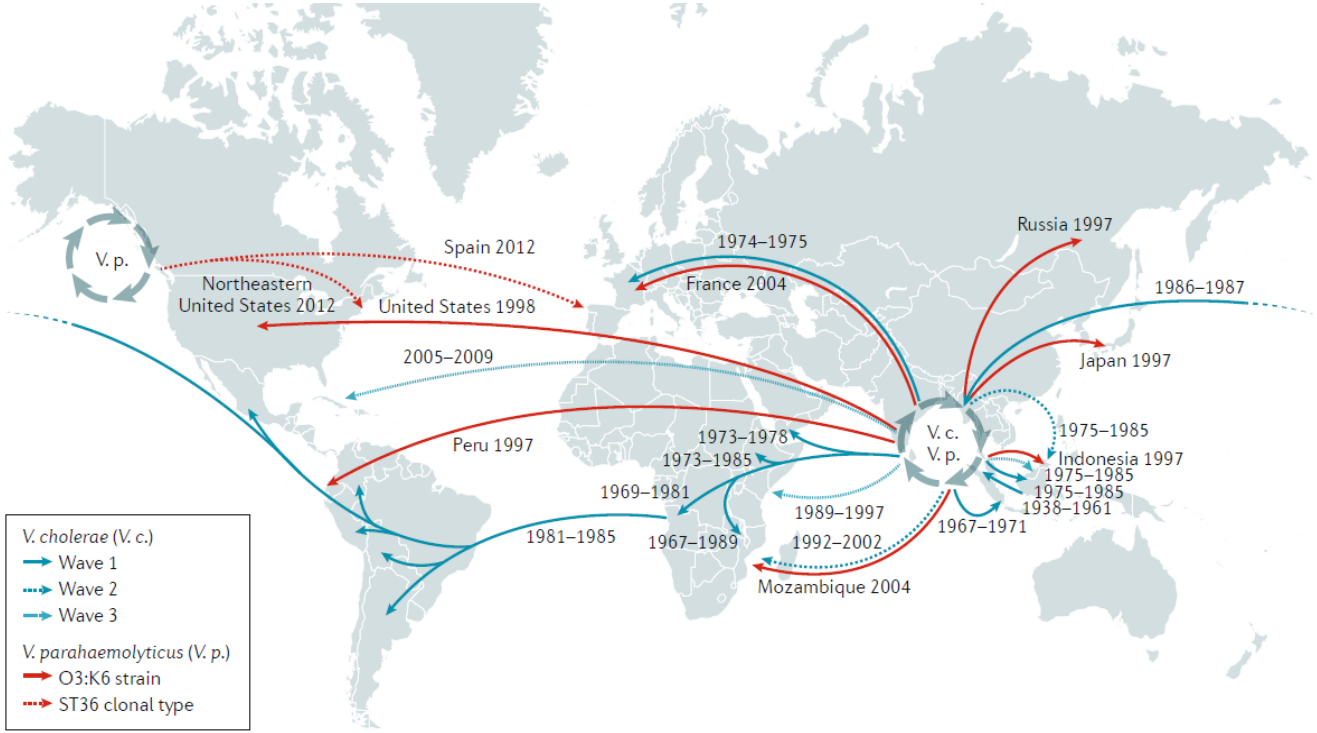
- Vibrio illnesses associated with shellfish were rarely reported prior to 2012. Reported cases were not attributable to a source
- Not a notifiable disease in Qld, NSW and Vic
- Attribution to source has improved since 2016 – illnesses have been reported in association with oysters from all major producing states
- 41 cases were reported between 2005 and 2020 from states where reporting is mandatory
- 290 cases reported in association with SA oysters in 2021/2022 during two outbreaks

Vibrio illnesses associated with the 2021 SA outbreaks

- 21 cases Feb-March 2021 associated with SA oysters
- >269 cases Sept ’21 - Dec ’22 associated with SA oysters, majority from Coffin Bay
- Unusual event - started at just below 15°C water temp (winter-spring)
- Research project proposed to investigate environment factors that may have contributed

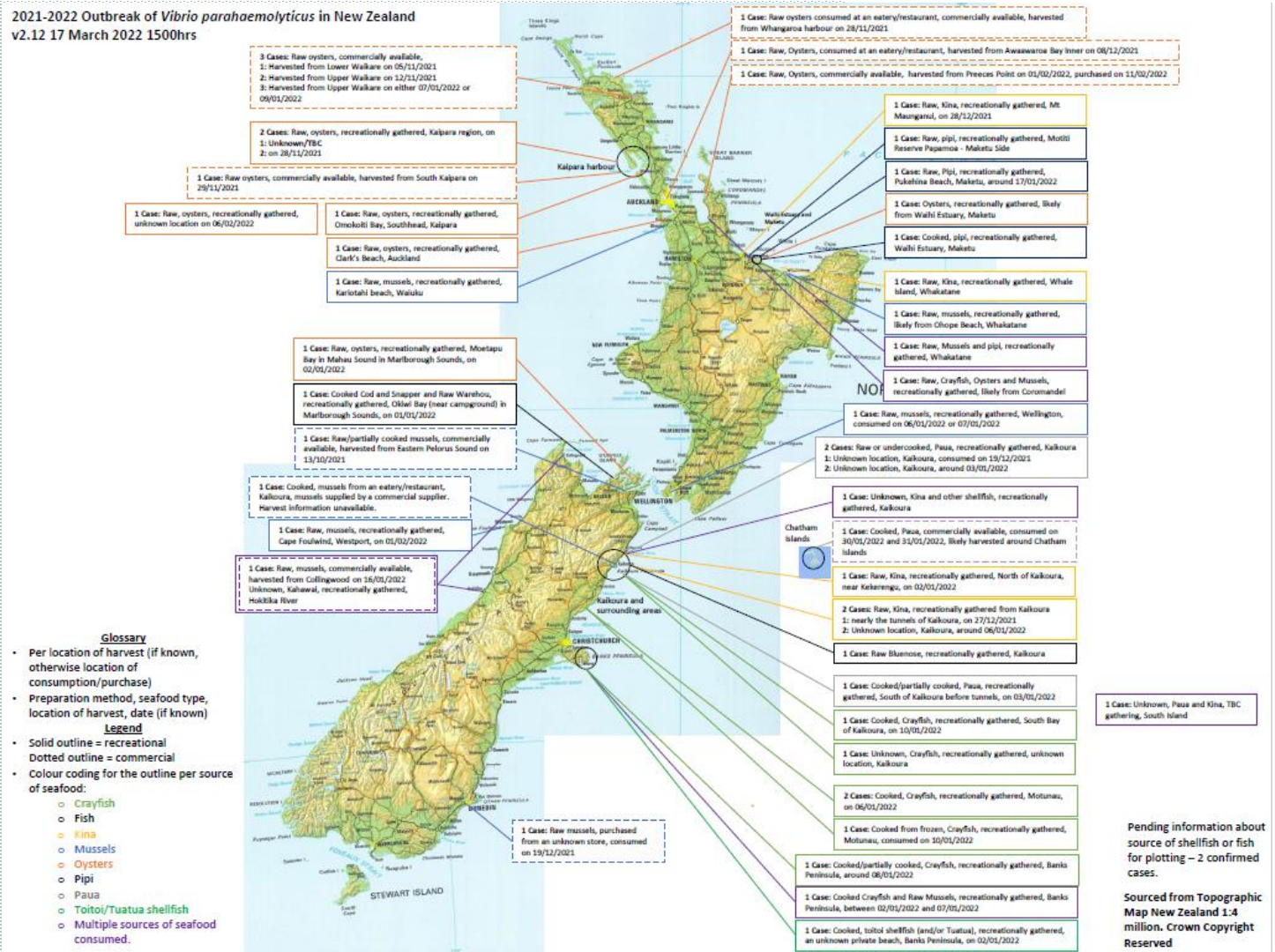


Tracking the source and spread of the new pandemic *V. parahaemolyticus*



- Outbreaks are undergoing a global process of expansion
- Emerging in areas where these diseases have not been previously observed – particularly in cold water climates
- ST36 pandemic strain emerged in NE USA in 2012
- SA 2021 outbreaks
  - Feb/March ST36
  - Sept-Jan ST50 & ST 417

Source: Baker-Austin et al. (2018)



Should we be worried?

Yes, absolutely

What can we do?.....

Challenges faced by Australia

New issue

Federal system

- Notifiable disease status
- Reporting between states

Reporting agreements between government departments

Lack of vibrio specific policy at ASQAAC

- When to close
- How to open
- Post-harvest treatment options

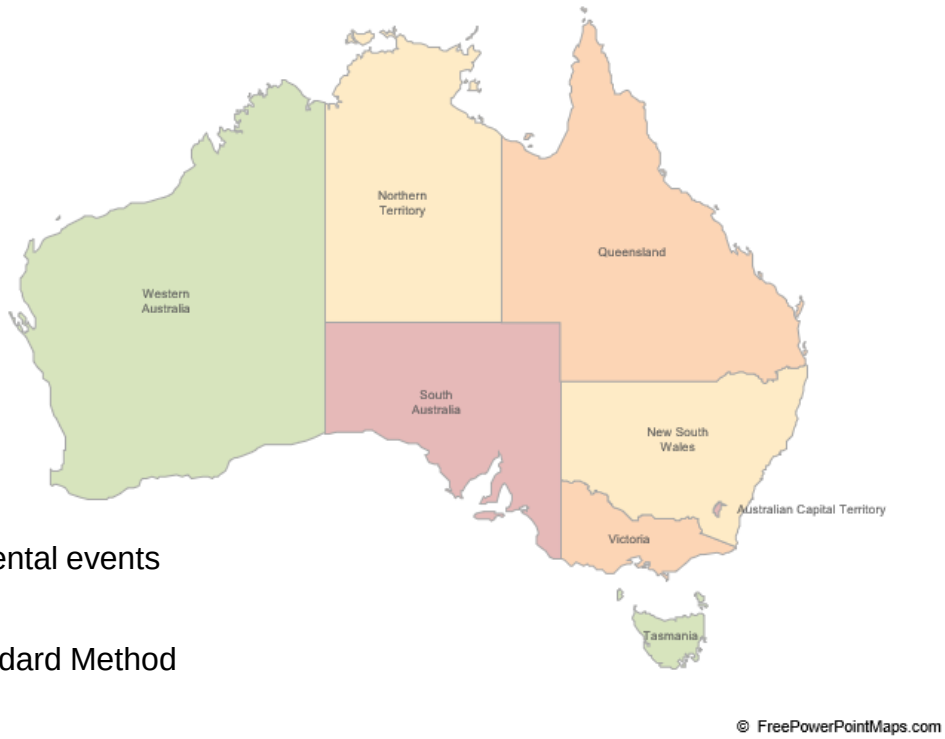
Low levels of contamination, sporadic illness

No history relating outbreaks/elevated numbers to environmental events

Lab capability & capacity

- Different methods in use, proposed changed to Aus Standard Method
- Sensitivity issues

Traceability issues in a complex supply chain



Knowledge gaps

- Levels pathogen associated with illness
  - Analytical sensitivity
  - Variability of serotypes (pathogenicity & virulence)
- What are pathogenicity markers?
- Relationships between environmental and clinical isolates
- Importance of gene translation
- Prevalence in oysters, environmental reservoirs
- Relationships with environmental factors
- ***How to manage risk in the absence of a measurable pathogen?***

What can growers do right now?

Vp Growers guide

- Cease harvesting
- Relaying to colder/saltier waters
- Harvest curfews
- Re-submerge
- Time to cool chain
- Packing practices

What can regulators do right now?

Vibrio Control Plans

- Required in SA and Tas in all areas that have been associated with illness
- Strict temperature control
- Strict record keeping or time of harvest, time to cool room, time of dispatch

Nov 1st – April 30th	Air temp >30 ºC	Water temp >19 ºC	Selling to public?
<12 hours to cool chain	<7 hrs to cool chain	<7 hrs to cool chain	Oysters <10 ºC

www.safefish.com.au/technical-program/vibrio-webinar-series

UNIVERSITY of TASMANIA

Thank you

SafeFish/ASQAAC vibrio science day 15th June

Register at www.SafeFish.com.au next week

FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

NSW SHELLFISH PROGRAM

SURVEY PLAN – *VIBRIO PARAHAEMOLYTICUS IN NSW OYSTERS 2022-2024*

NSW Oyster Conference
18 June 2022

NSW GOVERNMENT | Food Authority

Anthony Zammit – Manager NSW Shellfish Program

NEED FOR A VIBRIO PARHAEMOLYTICUS SURVEY

- Risk appears to be increasing globally.
- Recent increase in cases from Australian shellfish.
- Lack of data on levels and strains of *Vibrio parahaemolyticus in NSW waters.*
- NSW industry is expanding into new species.
  - Does this increase the risk of an outbreak?
  - Are tighter controls needed for new species such as pacific oysters?
- **Provide baseline data to assist in re-opening an area if an outbreak occurs.**

FOOD RECALL

Raw Pacific Oysters produced in Coffin Bay, SA

All production dates from and including 4 September 2021 up to and including 16 November 2021

SA Health has issued an emergency order to recall raw Pacific oysters (*Magallana gigas*) produced in Coffin Bay, SA, including fresh and frozen products. The oysters have been available for sale direct from farms, seafood outlets, grocery stores and supermarkets in SA, NSW, ACT, QLD, VIC, NT and WA.

Problem: The recall is due to microbial (Vibrio parahaemolyticus) contamination.

Food Safety Hazard: Food products contaminated with (Vibrio parahaemolyticus) may cause illness if consumed.

What to do: Consumers are advised not to eat raw Pacific oysters from Coffin Bay, including fresh and frozen products. Any consumers concerned about their health should seek medical advice. Consumers should dispose of the oysters or return the oysters to the place of purchase for a full refund.

For further information contact:

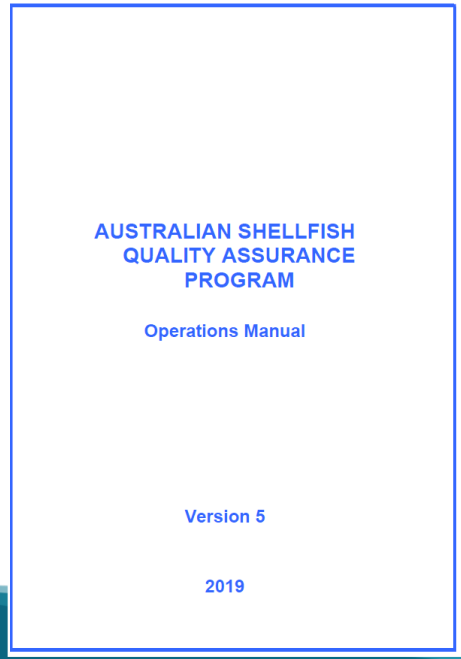
SA Health
www.sahealth.sa.gov.au
(08) 8226 7100
healthfood@sa.gov.au

See www.foodstandards.gov.au/recalls for Australian food recall information

RESPONSE TO AN ILLNESS OUTBREAK

- ASQAP Manual Section 9 – Investigation of Illness Associated with Shellfish
  - When two or more cases from the same harvest area must close the harvest area.
  - It must stay closed until the problem is identified and the risk removed or managed.
  - Key questions:
    - What has occurred?
    - Why did it happen?
    - How can it be prevented in the future?

- The survey will provide baseline data. This will assist in understanding if the environment (i.e. the Vp prevalence or strains present) has changed.


AUSTRALIAN SHELLFISH QUALITY ASSURANCE PROGRAM

Operations Manual

Version 5

2019

NSW SURVEY PLAN

- Survey to commence in March/April 2022 and run for 2 years.
- Test for presence and level of Vp.
- Analyse positive samples for virulence markers (tdh/trh markers).
- Estuaries chosen based on location, species and production.

Estuary/Harvest Area	Target Species	Number of Samples per Month
Manning River – Pelican Point	Sydney Rock Oysters	5
Wallis Lake – Long Island	Sydney Rock Oysters	5
Port Stephens – Lemon Tree Passage/Cromarty Bay	Sydney Rock Oyster and Pacific Oysters.	10
Clyde River - Rocky Point	Sydney Rock Oyster or Pacific Oyster.	5
Merimbula Lake – Top Lake	Sydney Rock Oyster	5
Samples per Month		*30*
Total Samples over 2 years		**720**

RESPONSE TO RESULTS

Result (cfu or MPN/g)	Interpretation	Action
<3	Satisfactory	No action required
<3-100	Marginal	Review survey results to determine if further investigation in required.
101-10,000	Unsatisfactory .	Further analysis of isolates to determine the level of pathogenic V.parahaemolyticus.
>10,000	Potentially hazardous	Further analysis of isolates to determine the level of pathogenic V.parahaemolyticus. Review environmental factors (temperature/salinity). Additional testing of harvested product to determine whether the elevated Vp levels are transient or endemic in nature. Consider whether current time and temperature controls are adequate to manage the risk considering the species in the harvest area. Additional testing of product along the supply chain to verify time/temperature protocols.

THANK YOU

QUESTIONS?

foodauthority.nsw.gov.au nswfoodauthority nswfoodauth

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