

Annex to: EFSA’s BIOHAZ Panel Scientific opinion “Public health aspects of *Vibrio* spp. related to the consumption of seafood in the EU”.  
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## Annex C – *Vibrio parahaemolyticus*, *Vibrio vulnificus* and non-O1/non-O139 *Vibrio cholerae* human cases associated with seafood consumption in Europe

**Table C.1:** Summary of the available information on *Vibrio parahaemolyticus*, *Vibrio vulnificus* and non-O1, non-O139 *Vibrio cholerae* human cases associated to seafood consumption in the EU.

<i>Vibrio</i> species	Country	Year	No of outbreaks	No of cases	Hospita- lisation	Sex	Age	Transmission	Co-morbidities	Symptoms	Outcome	Reference
Vc non-O1/non-O139	Finland	2003 (Aug)	NA	1	1	M	54	Seafood (home-salted whitefish) and seawater contact	Alcoholic liver cirrhosis	Abdominal pain, infection progressing into invasive abdominal infection	Death	Lukinmaa et al. (2006)
Vc non-O1/non-O139	France	2009 (Aug)	NA	1	1	M	63	Seafood (undercooked shrimps)	Chronic liver disease	Fever, jaundice, ascites and encephalopathy without gastrointestinal symptoms	Recovery	Petsaris et al. (2010)
Vc non-O1/non-O139	France (Bay of Biscay)	2001–2019	–	6 <sup>a</sup>	–	M (70%)	69 ± 20 <sup>b</sup>	– <sup>c</sup>	–	GE	–	Hoefler et al. (2022)
Vc non-O1/non-O139	Germany	2018–2019	–	4 <sup>a</sup>	–	–	–	–	–	GE	–	Brehm et al. (2021)
Vc non-O1/non-O139	Germany	2018–2019	NA	1	1	M	80s	Seafood (crab meat)	Unspecified chronic disease and immunosuppression	GE	Death	Brehm et al. (2021)
Vc non-O1/non-O139 (Vc O176)	Italy	2006 (Aug)	NA	1	1	M	44	Seafood (cooked prawns)	No	Watery diarrhoea and vomiting	–	Ottaviani et al. (2009)
Vc non-O1/non-O139	Italy	2006 (Sep)	NA	1	1	F	26	Seafood (mussels)	No	Watery diarrhoea	–	Ottaviani et al. (2009)

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O139 (Vc O37)

Vc non-O1/non-O139	Italy	2016 (Jul)	NA	1	1	M	83	Seafood (defrosted clams harvested by the patient) and seawater contact	Chronic obstructive pulmonary disease, alcohol abuse, cholecystectomy, resection of intestinal polyps complicated by intestinal perforation, colon diverticula, and systemic hypertension	Fever, tachycardia, and abdominal pain; no diarrhoea, nausea, or vomiting. Infection progressing into bacteriemia and pneumonia.	Recovery	Marinello et al. (2017)
Vc non-O1/non-O139	Northern European countries <sup>(e)</sup>	2018	-	3 <sup>(a)</sup>	-	-	-	Food/Water	-	-	-	Amato et al. (2022)
Vc non-O1/non-O139	The Netherlands	2006 (summer)	NA	1	1	M	late 60s	Seafood (raw herring)	Heart disease, insulin-dependent diabetes mellitus type II, cholecystectomy and aneurysm of the abdominal aorta	Severe diarrhoea; dyspnea, low O <sub>2</sub> saturation, tachycardia, fever; sepsis.	Recovery	Engel et al. (2016)
Vc non-O1/non-O139 <sup>(e)</sup>	The Netherlands	2013 (summer)	NA	1	1	M	50s	Seafood (ready-made tuna salad) and seawater contact	Tuberculosis, chronic obstructive pulmonary disease, depression, marihuana and excessive alcohol use	Hypothermia, tachycardia, and low O <sub>2</sub> saturation; pneumonia; extensive bullae on the lower extremities; sepsis.	Death	Engel et al. (2016)
Vc non-O1/non-O139	Portugal	2010 (Dec)	NA	1	1	M	37	Seafood (raw shrimp)	Hepatitis C cirrhosis	Fever, abdominal pain and watery profuse diarrhea	Recovery	Albuquerque et al. (2013)
Vc non-O1/non-O139	UK (Scotland)	2012	NA	1	1	M	74	Seafood (defrosted prawns, fish and shellfish consumed without heating)	Pancreatitis and bronchial carcinoma	Severe watery diarrhoea	Recovery	Marek et al. (2013)

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Vp	France	1997 (Apr)	1	44	-	-	-	Seafood (shrimp and shellfish soup)	-	Diarrhoea, abdominal pain, nausea, vomiting, and fever	-	Lemoine et al. (1997)
Vp	France	2001 (Jun)	11	100	-	-	-	Seafood (mussels)	-	-	-	Haeghebaert et al. (2001)
Vp	France (Bay of Biscay)	2001-2019	-	8 <sup>a</sup>	-	M 75%	53 ± 23 <sup>b</sup>	- <sup>d</sup>	-	GE	-	Hoefler et al. (2022)
Vp <i>tdh+</i> O3:K6 (pandemic strain)	Italy	2007 (summer)	NA	1	1	-	-	Seafood (fresh shellfish)	-	Diarrhoea	-	Ottaviani et al. (2008)
Vp <i>tdh+</i> O3:K6 (pandemic strain)	Italy	2008 (Aug)	NA	1	1	F	65	Seafood (mussels)	No	Diarrhea, abdominal cramps, nausea, and vomiting	Recovery	Ottaviani et al. (2010)
Vp <i>trh+</i> O1:KUT	Italy	2008 (Sep)	NA	1	1	M	55	Seafood (mussels)	No	Hypotension, myalgias, fever, and diarrhoea	Recovery	Ottaviani et al. (2010)
Vp	Northern European countries <sup>(d)</sup>	2018	NA	1 <sup>(a)</sup>	-	-	-	Food/Water	-	-	-	Amato et al. (2022)
Vp Kanagawa+	Spain (Catalogna)	1988 (Aug-Oct)	-	8	0	-	-	Seafood (fish or shellfish)	-	Acute GE	Recovery	Molero et al. 1989)
Vp <i>tdh+</i>	Spain (Galicia)	1999 (Aug-Sep)	3	64	9	-	43 <sup>b</sup>	Seafood (raw oysters)	-	Diarrhoea, abdominal cramps, nausea, headache, fever and vomiting	-	Lozano-Leon et al. (2003)
Vp <i>tdh+</i> O3:K6 (pandemic strain)	Spain (Galicia)	2004 (Jul)	1	80	-	-	-	Seafood (boiled crab incorrectly stored after preparation)	-	GE	-	Martinez-Urtaza et al. (2005)
Vp <sup>(f)</sup>	Spain (Catalogna)	2005 (Sep)	1	3	-	M (1) F (2)	40-50	Seafood (raw and steamed bivalve molluscs)	-	Watery profuse diarrhoea, severe abdominal	-	Sala et al. (2009)

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											pain, nausea and vomiting, and headache (n = 3); fever (n = 2); severe myalgia and bloody diarrhoea (n=1)		
Vp <i>tdh+</i> <i>trh+</i> O4:K12 (Pacific Northwest complex; ST36) and other Vp profiles	Spain (Galicia)	2012 (Aug)	1	51	-	-	-	Seafood (boiled shrimps cooled with contaminated ice)	-		Diarrhoea, abdominal pain, vomiting, nausea, low-grade fever and fever	-	Martinez-Urtaza et al. (2016)
Vp	The Netherlands	2006-2019	1	3	-	-	-	Seafood (shellfish)	-		-	-	Friesema et al. (2022)
Vv	France (oversea territory – New Caledonia)	2008		3	3	M	51	Seafood (raw oysters)	Alcohol abuse		Fever, muscle pains, and bleeding gums; septic shock	Death (3)	Cazorla et al. (2011)
						F	67		No				
						F	74		Lupus				
Vv	Spain	1998	NA	1	1	-	-	Seafood (raw oysters)	Cirrhosis		Septic shock and skin lesions	Recovery	García Cuevas et al. (1998)

Abbreviations: –, not available/not reported; EU, European Union; F, female; M, male; NA, not applicable; O<sub>2</sub>, oxygen; Vc, *V. cholerae*; Vp, *V. parahaemolyticus*; Vv, *V. vulnificus*; GE, gastroenteritis.

<sup>a</sup>Cases with exposure or symptomatology consistent with seafood-borne infection are reported.

<sup>b</sup>Average age.

<sup>c</sup>Seafood consumption/handling reported in 39% of all vibriosis cases.

<sup>d</sup>Norway, Sweden, Denmark, Finland, Poland and Estonia.

<sup>e</sup>Case misidentified as *V. albensis* in other reports.

<sup>f</sup>Simultaneous detection of Norovirus.

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