

## Effects of socioeconomic and cultural factors on *Vibrio* infections in humans

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Vibrios are widely distributed in the coastal environment of tropical, subtropical, and temperate zones. *Vibrio* species pathogenic to humans, if brought into the human environment through consumption of contaminated seafood or contaminated drinking water or direct contact with contaminated coastal water, may establish infections in humans. The infection may be an outbreak and can spread on various (up to international) scales. Some non-biomedical factors in the human environment can influence emergence and spread of the infections by human-pathogenic *Vibrio* species. Information on these factors is useful to establish preventive measures against the infections. I will explain examples of these factors, socioeconomic and cultural factors in particular, found during collaborative studies with our counterparts in Asia.

In our collaborative study on cholera in Sarawak, Malaysia, epidemiological analysis suggested (1) emergence of an cholera outbreak in a coastal area due to consumption of a conventional raw seafood called “Umai” and its spread to inland areas through move of infected people and an eating habit in funeral services and; (2) spread of cholera across the international border through labor transfer and merchants.

High socioeconomic status was found to be an important risk factor for *Vibrio parahaemolyticus* infection in a collaborative study carried out in the Khanh Hoa province of Vietnam.

A very high incidence of *V. parahaemolyticus* infection, particularly due to the O3:K6 pandemic strains, was confirmed in Hat Yai, southern Thailand. Molecular epidemiological data support the infection is caused by consumption of molluscan bivalves, including bloody clams (*Anadala granosa*), marketed in this area. The suspected risk factor was insufficient cooking of molluscan bivalves, a traditional eating habit in this area/country. We then demonstrated there is no patient with diarrhea due to *V. parahaemolyticus* infection in West Sumatra, Indonesia where a contrasting eating habit, sufficient cooking of molluscan bivalves, exists. This eating habit may be traced back to a description in the text of their religion, Islam.

We have been accumulating information and data to support the followings. The habit of eating insufficiently cooked bloody clams is common mostly in non-Islamic communities in Southeast Asia and East Asia. An aphrodisiac story for insufficiently cooked bloody clams seems in part to promote trading of bloody clams and thus international spread of infection by the pandemic clone of *V. parahaemolyticus* among Asian countries.