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Warming oceans trends broaden the range of marine bacteria that cause human diseases.

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Abstract Warming oceans caused by climate change are increasing the number and likelihood of occurrence of human diseases. In a recent work by Baker-Austin and colleagues, the emerging risk of bacterial pathogens of the genus Vibrio is presented relevant to the increase in sea surface temperatures. Vibrio spp. are ubiquitous in coastal environments, and while most species are not pathogens there are a few species, such as V. vulnificus and V. parahaemolyticus that are the causative agents of deadly diseases. These pathogens exhibit seasonal trends, and even in warm climates may be undetectable during the colder months. In Northern Europe, there have been few recorded cases of infection by these bacteria because temperatures were traditionally below the favorable range for vibrios. The authors compared long-term sea surface temperatures, satellite data, and epidemiological data on Vibrio diseases to show a link between recent warming trends and increasing infection risk. The examination of the Baltic area revealed it to be the fastest warming marine system on the planet, and data suggest these rapidly warming waters are more conducive to pathogenic Vibrio bacteria. This point is evidenced by recent heat waves in the area corresponding with huge spikes in reported infections. The development of accurate models of Vibrio abundance or infection risk is critical to forecasting which areas these diseases might be emergent.

Keywords : Ocean trends, marine bacteria, human diseases, V. vulnificus, V. parahaemolyticus,

There has been much discussion, especially recently, about the impacts of climate change. One interesting area is the ecology of human disease. In a world where oceans are warming at alarming rates, the relationship between oceans and human health has become an important area of research. Diseases that affect the health of our seafood supply by harming harvested species indirectly threaten us, but marine diseases directly affect human health as well. Increasing occurrences of harmful algal blooms and increased transmission potential of cholera are two examples. In a recent work by Baker-Austin and colleagues, the emerging risk of bacterial pathogens of the genus *Vibrio* is presented relevant to the increase in sea surface temperatures. *Vibrio* spp. are ubiquitous in coastal environments, and while most species are not pathogens there are a few species, such as *V. vulnificus* and *V. parahaemolyticus* that are the causative agents of deadly diseases, usually resulting in amputation or often death. These pathogens exhibit seasonal trends, and even in warm climates may be undetectable during the colder months. In Northern Europe, there have been few recorded cases of infection by these bacteria because temperatures were traditionally below the favorable range for vibrios. The authors

compared long-term sea surface temperatures, satellite data, and epidemiological data on *Vibrio* diseases to show a link between recent warming trends and increasing infection risk. The examination of the Baltic area revealed it to be the fastest warming marine system on the planet, and data suggest these rapidly warming waters are more conducive to pathogenic *Vibrio* bacteria. This point is evidenced by recent heat waves in the area corresponding with huge spikes in reported infections. The development of accurate models of *Vibrio* abundance or infection risk is critical to forecasting which areas these diseases might be emergent.

Paper Reference:

Baker-Austin, C., Trinanes, J. A., Taylor, N. G., Hartnell, R., Siitonen, A., & Martinez-Urtaza, J. (2012). Emerging Vibrio risk at high latitudes in response to ocean warming. *Nature Climate Change*, *3*(1), 73-77.