Medical Xpress

Scientists warn of rise in potentially fatal bacterial infection due to global warming

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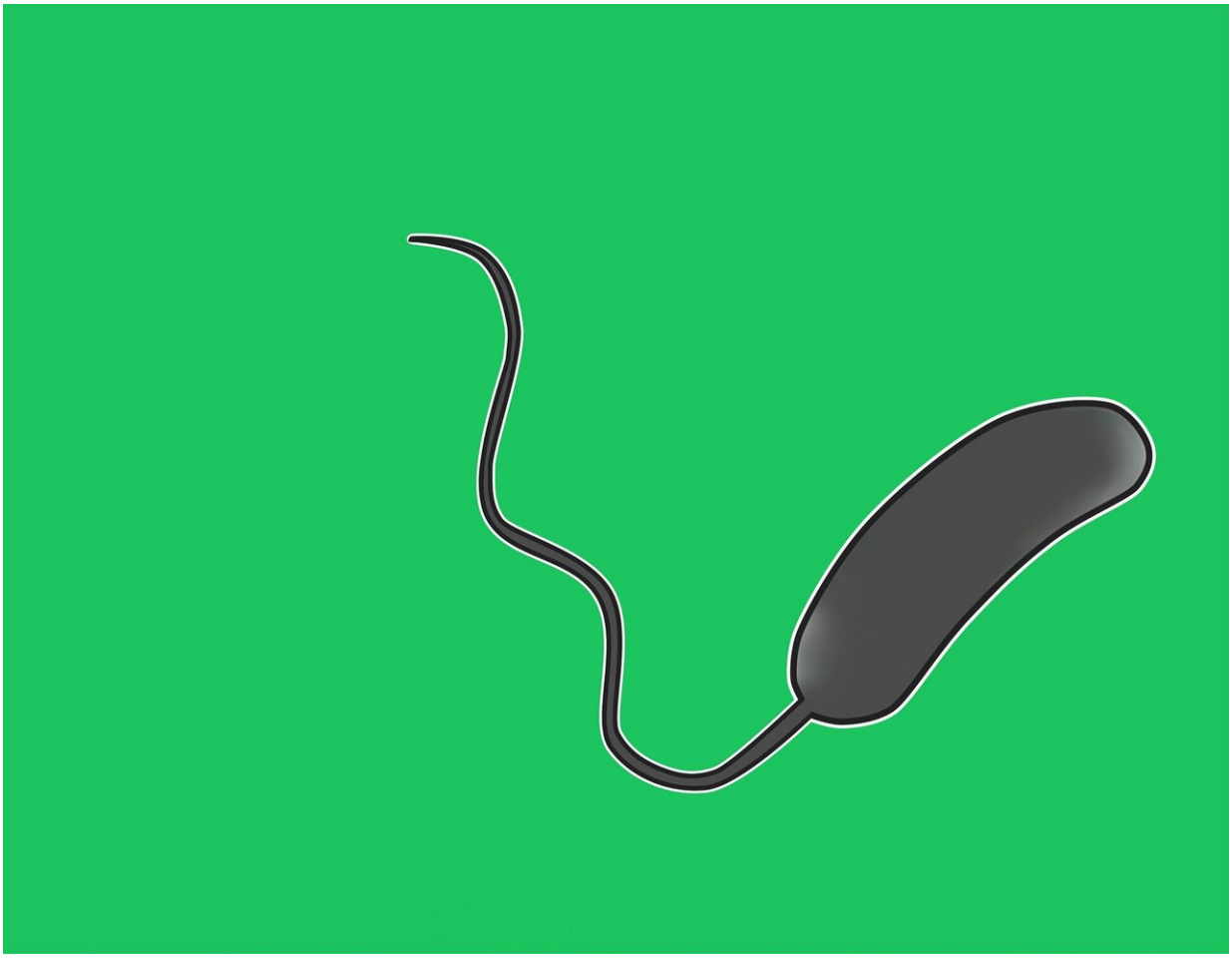

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Continued warming of the climate would see a rise in the number and

spread of potentially fatal infections caused by bacteria found along parts of the coast of the United States.

Vibrio vulnificus bacteria grow in warm shallow coastal waters and can infect a cut or insect bite during contact with seawater. A new study led by the UK's University of East Anglia (UEA) shows that the number of V. vulnificus infections along the East Coast of the U.S., a global hotspot for such infections, has gone up from 10 to 80 per year over a 30-year period.

In addition, every year cases occur further north. In the late 1980s, cases were found in the Gulf of Mexico and along the southern Atlantic coast but were rare north of Georgia. Today they can be found as far north as Philadelphia.

The researchers predict that by 2041–2060, infections may spread to encompass major population centers around New York. Combined with a growing and increasingly elderly population, who are more susceptible to infection, annual case numbers could double.

By 2081–2100, infections may be present in every Eastern US state under medium-to-high future emissions and warming scenarios.

The findings, published today in the journal *Scientific Reports*, are important because although the number of cases in the US is not large, someone infected with V. vulnificus has a one-in-five chance of dying. It is also the most expensive marine pathogen in the US to treat.

The illness peaks in the summer and sees the bacteria spread rapidly and severely damage the person's flesh. As a result, it is commonly called a "flesh-eating" illness and many people who survive have had limbs amputated.

Lead author of the study Elizabeth Archer, a postgraduate researcher in UEA's School of Environmental Sciences, said, "The projected expansion of infections highlights the need for increased individual and public health awareness in the areas affected. This is crucial as prompt action when symptoms occur is necessary to prevent major health consequences.

"Greenhouse gas emissions from human activity are changing our climate and the impacts may be especially acute on the world's coastlines, which provide a major boundary between natural ecosystems and human populations and are an important source of human disease.

"We show that by the end of the 21st century, V. vulnificus infections will extend further northwards, but how far north will depend upon the degree of further warming and therefore on our future greenhouse gas emissions.

"If emissions are kept low, then cases may extend northwards only as far as Connecticut. If emissions are high, infections are predicted to occur in every US state on the East Coast. By the end of the 21st century, we predict that around 140-200 V. vulnificus infections may be reported each year."

The research team suggests that individuals and health authorities could be warned in real time about particularly risky environmental conditions through marine or Vibrio-specific early warning systems.

Active control measures could include greater awareness programs for at-risk groups, for example the elderly and individuals with underlying health conditions, and coastal signage during high-risk periods.

Co-author Prof. Iain Lake from UEA said, "The observation that cases of V. vulnificus have expanded northwards along the East Coast of the

US is an indication of the effect that climate change is already having on human health and the coastline. Knowing where cases are likely to occur in future should help health services plan for the future."

The study is the first to map how the locations of V. vulnificus cases have changed along the eastern coastline of the US. It also the first to explore how climate change may influence the spread of cases in the future.

Information on where people caught V. vulnificus infection was obtained from the US Centers for Disease Control and Prevention. This allowed the team to map how cases of Vibrio vulnificus have extended northwards over 30 years from 1988-2018.

Temperature information based on observations and computer-based climate models were then used to predict where in the US cases might occur by the end of the 21st century.

Co-author Prof. James Oliver from the University of North Carolina Charlotte, in the US, said, "This is a landmark paper which not only ties global climate change to disease but provides strong evidence for the environmental spread of this extremely deadly bacterial pathogen."

More information: Climate warming and increasing Vibrio vulnificus infections in North America, *Scientific Reports* (2023). doi.org/10.1038/s41598-023-28247-2

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