
Cholera is an acute bacterial infection of the small intestine, caused by Vibrio cholerae and characterised by massive diarrhoea with rapid and severe depletion of body fluids and salts. The bacteria enter the body through the mouth, by ingestion of contaminated water and foods, causing an infection in the mucous membranes lining the lumen of the small intestine.

Accordingly the multi-disciplinary team investigated the ecology of the bacteria to determine possible linkages between cholera outbreaks in the area and various land and sea conditions with the overall aim to develop research capacity in modelling the bio-complexity of diseases. The research focussed on an area in Beira, a coastal city in Mozambique. The long term aim of this and other related projects is to develop algorithms that can accurately predict a potential cholera outbreak, 3-4 weeks in advance.

Findings to date are:

- A correlation between certain environmental data (meteorological data) and the cholera case data. It did not, however, prove a causal relationship between these variables and the occurrence of cholera cases.
- A correlation between certain physical chemical data (accumulated rainfall and salinity) and the presence of V. cholerae in samples collected in Beira was observed.
- No significant correlation between chlorophyll a concentrations and cholera cases in Beira was noted, this is in contrast to trends noted elsewhere (Bangladesh)

Thus a need was identified to understand the microbiological factors contributing to environmental drivers associated with persistence of cholera bacteria and cholera outbreaks, and consequently the...
Further investigations into the role of the various identified reservoirs, the role of Vibrio cholerae O139 and human risk factors will be undertaken. Non-linear dynamics and chaos theory will be applied to enhance our understanding of the link between the microbial ecology, remote sensing and meteorological data.

Contact details:
CSIR Natural Resources and the Environment
Ms Martella du Preez
Senior researcher
Tel +27 12 841 3950
Fax +27 12 842 7663
Email mdupreez@csir.co.za
www.csir.co.za