

Reservoir of deforming tropical disease sought

October 5 2009

Knowing what causes a disease may not make it easier to control and contain infection, but understanding how humans become infected and where the pathogens live may improve control. A National Science Foundation grant for \$1.5 million over five years will allow an international team of researchers to investigate how changes in the environment affect a deforming tropical disease called Buruli ulcer.

"We believe that Buruli ulcer outbreaks are triggered by increased environmental vulnerability resulting from disturbance in the form of more extreme and frequent rainfall, and slow landscape changes due to deforestation, agriculture and mining activities," said Petra Tschakert, assistant professor of geography at Penn State.

Buruli ulcer is caused by mycobacterium ulcerans, a relative of the bacteria that cause [leprosy](#) and tuberculosis. Reported to exist in at least 30 tropical and subtropical countries, the World Health Organization suggests it may occur in other places but is unreported. The disease typically affects the arms or legs of adults, the whole body of children, and causes large, open, potentially deforming sores. Buruli ulcer occurs mostly in poor rural communities and appears to be increasing in prevalence. It is one of the most neglected but treatable diseases in tropical countries.

The researchers will use a combination of environmental sampling; interviews and surveys, participatory mapping activities and advanced systems models to unravel the complexity of Buruli ulcer infection. The

work will take place in Ghana in collaboration with local researchers and health practitioners. Previous work by other scientists suggests that the disease's spread is linked to bodies of stagnant water and the bacteria have been isolated from a fresh water insect. Tschakert and her team will test the role of land disturbances -- such as mining and reservoir creation -- on the disease. Their research will help identify the natural reservoir for Buruli ulcer and how the disease is activated and transmitted to humans, all of which are currently unknown.

"We are excited to address new and important questions regarding complex, emerging diseases in changing landscapes, with particular emphasis on types and scales of interactions, positive feedbacks, thresholds and non-linear dynamics," said Erica Smithwick, assistant professor of geography.

Source: Pennsylvania State University ([news](#) : [web](#))

Citation: Reservoir of deforming tropical disease sought (2009, October 5) retrieved 2 May 2024 from <https://medicalxpress.com/news/2009-10-reservoir-deforming-tropical-disease-sought.html>

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