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A Global Fight Against Buruli Ulcer

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A University of Dayton biology professor will present his research on a disfiguring tropical skin disease next week to the World Health Organization in Geneva.

Professor Eric Benbow is among the lead researchers in the world studying the transmission of the Buruli ulcer into human populations. The disease causes large lesions on the skin, often leading to amputation or disfiguration. It most commonly affects children and is most prevalent in West Africa, but it has recently begun affecting residents of southern Australia.

Each March, the World Health Organization meets to discuss the Buruli ulcer, inviting representatives of ministries of health from affected countries, as well as researchers and nongovernmental organizations. This year's conference is March 22-24 in Geneva.

The WHO selected Benbow to act as chairperson for the first research session on Tuesday, March 23, to discuss the Buruli ulcer in the environment and transmission to humans. He is co-author on five papers to be presented at the session as well as lead author on a study to be presented later in the day, titled "The role of climate-environmental-human interactions for predicting Buruli ulcer emergence in Victoria, Australia."

The Buruli ulcer is sometimes called the "mysterious disease" because its transmission is unknown. Laboratory studies have implicated biting water bugs as carriers and likely transmitters of the disease. However, in a field study in Ghana, Benbow found no strong evidence to support this hypothesis. *Emerging Infectious Diseases* published his research findings in its August 2008 issue.

The results of the study do not prove that infection could never occur from biting water bugs, but they do suggest such an event would be rare, Benbow said.

"Although we still haven't determined how Buruli ulcer spreads, we are one step closer, and we can now focus our attention on other likely causes," he said.

The research he will present at the WHO meeting next week found that climate — particularly flooding and high temperatures — is an important driver of emergence of the disease in southern Australia. It is possible standing water acts as an incubator both for the disease and for mosquitoes, which may act as carriers although not definitely proven.

Although transmission methods have not yet been confirmed, scientists do know the disease is caused by a bacterium — Mycobacterium ulcerans — and primarily afflicts children younger than 15 in Africa and the elderly in Australia. Scientists also recognize a connection between the disease and bodies of water such as slow flowing rivers, ponds, swamps and lakes.

Concern about the growing spread of the Buruli ulcer since 1980, particularly in West Africa and Australia, has prompted serious investigation into its transmission, treatment and prevention. Benbow's research in Ghana is funded by a five-year, $2-million grant from the National Institutes of Health and the National Science Foundation awarded to researchers from the University of Dayton, Michigan State University, Noguchi Memorial Institute for Medical Research at the University of Ghana and the University of Tennessee.

Related to leprosy and tuberculosis, the Buruli ulcer often starts as a painless swelling in the skin, usually on the legs or arms. According to the World Health Organization, the disease progresses with no pain and fever, which may partly explain why those affected often do not seek prompt treatment. However, without treatment, massive ulcers can appear, and bones can be affected causing gross deformities. When lesions heal, scarring may cause restricted movement of limbs and other permanent disabilities.

According to the WHO, the disease is treatable with antibiotics and surgery, but its impact on the few health facilities in affected areas is enormous. Hospital stays of more than three months per patient represent a huge loss in productivity for adults and loss of educational opportunities for children. The long-term care of those disabled by the disease places an additional burden on affected families.

For more information on Buruli ulcer, visit http://www.who.int/buruli/en.

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