

Effect of Climate Change on the Disease Biology of Vector Borne Helminth Diseases in Africa

An ongoing Ph.D. Project by Ulrik Bo Pedersen, commenced January 2011

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Abstract

The aim of the project is to model the distribution of three diseases: schistosomiasis, fascioliasis and paramphistomosis. The three diseases are caused by helminths with complicated lifecycles including fresh water snails as intermediate hosts. The distribution of the snail host is known to have a strong response to environmental factors, whereof climate is a significant factor.

A mathematical modelling-system will be compiled using Bayesian statistics and involves ecological niche simulations for snails and parasites, epidemiological models for disease transmission, supplemented with models for different driving factors such as climate, landuse, soil characteristics a.o. The modelling-system will be used to produce maps of future distribution of disease prevalence in all areas of Zimbabwe to be used as decision support by health professionals.

Data from a national snail survey conducted in 1988 covering all bioclimatic zones in Zimbabwe has been made available for this study. As global climate has shown climate change patterns in the period since 1988 (IPCC) will snail collection data from a planned survey for 2012 make it possible to study the effect of climate change. These studies will also be valuable for validation of the models' ability for realistic forecasting.

The work is conducted at the Mandahl-Barth Research Centre within the DBL-Centre for Health Research and Development (LIFE). DBL-Centre for Health Research and Development has 30 years experience in working with helminth infections including modelling and health system support.