

# Disease Ecology, Health and the Environment: A Framework to Account for Ecological and Socio-economic Drivers in the Control of Neglected Tropical Diseases

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## Abstract

Reducing the burden of neglected tropical diseases (NTDs) is one of the key strategic targets advanced by the Sustainable Development Goals. Despite the unprecedented effort deployed for NTD elimination in the past decade, their control, mainly through drug administration, remains particularly challenging: persistent poverty and repeated exposure to pathogens embedded in the environment limit the efficacy of strategies focused exclusively on human treatment or medical care. Here, we present a simple modelling framework to illustrate the relative role of ecological and socio-economic drivers of environmentally transmitted parasites and pathogens. Through the analysis of system dynamics, we show that periodic drug treatments that lead to the elimination of directly transmitted diseases may fail to do so in the case of human pathogens with an environmental reservoir. Control of environmentally transmitted diseases can be more effective when human treatment is complemented with interventions targeting the environmental reservoir of the pathogen. We present mechanisms through which the environment can influence the dynamics of poverty via disease feedbacks. For illustration, we present the case studies of Buruli ulcer and schistosomiasis, two devastating waterborne NTDs for which control is particularly challenging.

Read the full article in [Philosophical Transactions of the Royal Society B](#) [1].

## Associated Project:

[Land Use Change & Infectious Diseases](#) [2]

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