



Climate-disease dynamics of bloodstream infections in Lao PDR 2020-2025

Tamalee Roberts

Lao-Oxford Mahosot Hospital Wellcome Trust Research Unit (Laos)

Lao PDR (Laos) is a land-linked country in Southeast Asia with a population of approximately 6.9 million people. The cool dry season is from November to February, a hot dry season occurs from March to May, with the monsoon wet season from late May to October. There is a predominantly rural population (67%), though urbanization is increasing. There is little known about the seasonal patterns and climate dynamics driving bloodstream infections in Laos. Mahosot Hospital, located in Vientiane Capital, is the main hospital in the country seeing ~2000 patients/month. Between 2020-2025 47,998 blood cultures were processed in the Mahosot Hospital Microbiology Department, with a further 14,227 blood cultures processed in five Provincial Hospitals around the country, with 5,334 (8.6%) positive for a significant organism. Clear patterns have emerged for some bacterial infections with *Salmonella* Typhi predominating in the hot month of April, while *Burkholderia pseudomallei* (melioidosis), the leading infectious disease cause of mortality in Laos, has a strong association with precipitation with most cases occurring during the peak wet season and mainly in the central and southern regions. Other bacterial infections were found to be associated with low precipitation, increased heat or humidity. This study investigates the changing climate-disease dynamics of bloodstream infections in Laos with modelled predictions on how increasing periods of high temperature and extreme rainfall may impact the epidemiology of infections and shows the epidemic risk of diseases moving into new regions due to changing environments caused by new weather patterns.

