

# Spatial transmission and risk assessment of West Nile virus on a growing domain

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## Abstract

This paper is concerned with a West Nile virus (WNV) model on a growing domain, which accounts for habitat expansion of mosquitoes because of climate warming. We aim to understand the relationship of the growing rate and the transmission risk of WNV. The basic reproduction number, which is related to the growing rate and diffusion rate, is introduced through spectral theory. The conditions to determine whether the virus vanishes or spreads are deduced. The obtained results reveal that domain growth leads to increased risk of infection, and is detrimental to the control and prevention of WNV. To verify the feasibility of our analytical results on the long time behavior of WNV, some numerical simulations are given.

## Hosted file

WNV\_final.pdf available at <https://authorea.com/users/354281/articles/477894-spatial-transmission-and-risk-assessment-of-west-nile-virus-on-a-growing-domain>