Biomathematics Seminar Series

Department of Mathematics and Statistics

Human Movement and Vector-borne Diseases

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With travel becoming more frequent across the world, it is important to understand how spatial dynamics impact the spread of diseases. Human movement plays a key part on how a disease can be distributed as it enables a pathogen to invade a new environment and helps the persistence of a disease in locations that would otherwise be isolated. In this project, we explore how spatial heterogeneity combines with mobility network structure to influence vector-borne disease dynamics by using cellphone data from Namibia. In addition, we derived an approximation for the domain reproduction number for a n-patch SIR Ross-MacDonald model using a Laurent series expansion. Lastly, we will analyze the sensitivity equations with respect to the domain reproduction number to determine which parameters should be targeted for intervention strategies.

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