

Understanding the Impact of Social Factors on the Transmission Dynamics of Infectious Diseases.

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This presentation explores the possible impacts of environmental dependent risk on disease dynamics within a Lagrangian modeling perspective; where the identity (defined by place of residency) of individuals is preserved throughout the epidemic process. Scenarios explored include the impact of individuals who refuse to be vaccinated, and the dynamics of Zika virus and Tuberculosis in two highly distinct idealized environments defined by a parameter that models highly distinctive levels of risk. The underlying assumption is that these two communities are intimately connected due to economics with the impact of various patterns of mobility being incorporated via the use of residency times. In short, a highly heterogeneous region is defined by its risk of acquiring an infection within one of two communities when one is lacking access to health services or effective vector control policies (lack of resources or ignored due to high levels of crime, or poverty, or both) while the other has access to solid health facilities and where vector control measures are implemented routinely. The impact of mobility within these two highly distinct risk environments on the dynamics and control of these diseases is systematically explored. It is found that collaboration and mobility, under some circumstances, can reduce the overall disease burden.