COLLEGE OF PUBLIC HEALTH DEAN'S LECTURE SERIES

Presents

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Eco-Epidemiology of Vector-Borne Diseases: Linking Vectors, Humans, and Environment to Understand the Spatial Dimension of Pathogen Transmission

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Vector-borne diseases (VBDs) rank among the world's most common and devastating maladies. Regardless of the vector species and mode of transmission, VBD control relies on the simple assumption that, by eliminating the link between humans and vectors, transmission can be halted. Although studied and applied for more than a century, our success in accomplishing such goal has been limited and mostly short-lived, particularly for neglected and zoonotic VBDs. Unsuccessful programs are often blamed of lack of resources, lack of political will, or ineffective implementation. Even more important is our limited understanding of the relationships between available control interventions, vector biology, human behavior, and pathogen transmission dynamics. I base my research program on the notion that epidemiological outcomes (i.e., the occurrence of human or animal disease) are the result of intricate and complex interactions between vectors, hosts, parasites, and the environment; and that by accounting for such complexity current efforts geared to control VBDs can be significantly improved. In this talk, I will introduce examples of my research dealing with three VBDs of global health significance: Chagas' disease, dengue and West Nile virus. Specifically, I will talk about my efforts to understand how vector biology and ecology modulate their occurrence and local spatial spread, how human behavior and environmental variability impact their dynamics of transmission and, particularly, in how to take advantage of such knowledge to improve current vector control interventions.