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# Anticipating elimination of mosquito-borne diseases

Suzanne M. O'Regan
*National Institute of Mathematical and Biological Synthesis (NIMBioS)*, soregan@nimbios.org

Jonathan Lillie
*North Hall High School, Gainesville, GA*

John M. Drake
*University of Georgia*

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# Anticipating elimination of mosquito-borne diseases

Mosquito-borne diseases contribute significantly to the global disease burden. High-profile elimination campaigns are currently underway for many parasites, e.g., *Plasmodium* spp., the causal agent of malaria. Sustaining momentum near the end of elimination programs is often difficult to achieve and consequently quantitative tools that enable monitoring the effectiveness of elimination activities after the initial reduction of cases has occurred are needed. In this talk, I consider compartmental Ross-McDonald models that are slowly forced through a critical transition through gradually deployed control measures. I derive expressions for the behavior of candidate indicator statistics, including the autocorrelation coefficient, variance, and coefficient of variation in the number of human cases during the approach to elimination. We conducted a simulation study to test the performance of each summary statistic as an early warning system of mosquito-borne disease elimination. Variance and coefficient of variation were highly predictive of elimination but autocorrelation performed poorly as an indicator in some control contexts. Our results suggest that bifurcations in mosquito-borne infectious disease systems may be foreshadowed by characteristic temporal patterns of disease prevalence.