

MATHEMATICAL ASSESSMENT OF THE ROLE OF TEMPERATURE VARIABILITY ON MALARIA CONTROL STRATEGIES

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In this talk, we present both non-autonomous (temperature independent) and autonomous (temperature dependent) models for the transmission dynamics of malaria in a population. The models are used to assess the impact of temperature changes on various control strategies. Threshold quantities (such as the basic offspring number and the reproduction ratio) and their interpretations for the models are presented. Conditions for local asymptotic stability of the disease-free solutions are computed [1]. Sensitivity analysis using mean monthly temperature data from Kwazulu Natal Province of South Africa [2] were used to assess the parameters that have the most influence on malaria transmission. The effect of various control strategies (bed nets, adulticides and vaccination) were assess via numerical simulations.

REFERENCE

- [1] Anguelov R, Garba SM, Usaini S, Backward bifurcation analysis of epidemiological model with partial immunity, 68(9), 931-940 (2014)
- [2] Okuneye K, Gumel AB, Analysis of a temperature-and rainfall-dependent model for malaria transmission dynamics, Mathematical biosciences, 31(287), 72-92 (2017)