Asymptotic analysis and monotone systems in malaria analysis

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Due to the presence of populations with widely different vital rates, such as mosquitoes and humans, malaria dynamics offers rewarding examples of multiscale models. Recent developments in singular perturbation theory allow for a significant simplification of such models without losing salient features and their original long-term dynamics. Moreover, in many cases, the application of the singular perturbation theory leads to simplified models that are monotone and thus allow a more comprehensive analysis. We illustrate the theoretical results by concrete models describing the spreading of malaria and a gonotrophic cycle of mosquitoes.

References

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