

Modeling and Analysis of Structured Population: Drug Resistance in Malaria

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Abstract: To obtain more detailed information about the dynamics of malaria in connection with drug resistance, a new mathematical model is developed in form of a dynamical system for structured populations. Densities for the drug sensitive and resistant parasites are considered as structure variables. The model system consists of functional-differential equations, including integro-partial differential equation with implicit boundary conditions. The existence and uniqueness of nonnegative solutions are proven, based on theoretical results for systems of functional-differential equations with multiple structural variables, derived in our previous work An et al.2015. The relevance of the presented model system for better understanding and controlling of infectious diseases and drug resistance is discussed.

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