

1154-92-1689

Margaret A. Grogan* (mgrogan1@vols.utk.edu) and **Olivia Prosper** (oprosp@utk.edu).

Non-exponentially distributed waiting times in a two-strain SITR vector-borne disease model. Preliminary report.

Many epidemiological models assume that the waiting times for each of the disease stages are exponentially distributed in order to simplify the model formulation and its analysis. However, this is not always the correct assumption and many methods have been developed to account for the potential variability in waiting time distributions for each stage. It is important to create a more accurate representation of these waiting times when dealing with pharmacological responses due to disease treatment in order to capture the interaction between drug concentration and pathogen load within hosts. This interaction can help us model within-human pharmacodynamics and pharmacokinetics, which can help inform drug development and treatment in human populations. It is especially important to understand this interaction in order to reduce the spread and prevalence of drug-resistant strains. We use malaria as a guiding example and formulate a two-strain SITR model with general waiting time distributions in order to more accurately capture the within-human and between-human disease dynamics with treatment. (Received September 16, 2019)