

Abstract Submitted
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Stochastic disease extinction in multistrain diseases with interacting strains SIMONE BIANCO, LEAH SHAW, The College of William and Mary, IRA SCHWARTZ, Naval Research Laboratory — The study of multistrain diseases, diseases with several coexisting strains, is a major challenge for mathematical biology. Examples of such diseases are influenza, HIV, dengue and ebola. In this work we present an agent-based model for multistrain diseases with strain interactions mediated by antibody-dependent enhancement. An individual infected with a strain develops antibodies which will protect him/her against all the strains. When the level of protection wanes, the presence of antibodies will enhance the infectiousness of the individual when an infection with a different strain occurs. This mechanism is called antibody-dependent enhancement (ADE). We use this model to investigate the role that fluctuations due to system size have on disease extinction paths and discuss how interactions mediated by ADE affect rates of disease fade-out. Finally, we discuss the effect that varying the number of strains has on disease extinction.

Simone Bianco
The College of William and Mary

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