

Abstract Submitted  
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**Epidemics with Multistrain Interactions: Cross Immunity and Antibody-Dependent Enhancement** SIMONE BIANCO, LEAH SHAW, College of William and Mary — Dynamics of epidemic spread is a problem of global interest. In this work we investigate the dynamical properties of a multistrain disease in a population where the strains interact via antibody-dependent enhancement (ADE) and cross immunity. ADE is a property of some multistrain diseases, such as dengue fever and Ebola, in which the antibodies generated by a primary infection with a strain tend to increase the infectiousness of a secondary infection with a different strain. After a primary infection, cross immunity provides temporary reduced susceptibility to the other strains. The presence of chaotic outbreaks and desynchronization between strains has already been observed in a model with no cross immunity if the ADE is sufficiently strong. The addition of weak cross immunity provides a stabilizing effect, while strong cross immunity leads to large amplitude chaotic outbreaks. A stochastic version of the model is also considered.

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