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Sourya Shrestha*, Department of Ecology & Evolutionary Biology, 2019 Kraus Natural Science Building, 830 North University Avenue, Ann Arbor, MI 48109, and **Betsy Foxman** and **Pejman Rohani**. *Influenza-pneumococcal interaction*.

Polymicrobial infections, where multiple pathogens interact synergistically/antagonistically in the manifestation of the infection, are common. Co-circulating pathogens influenza virus and pneumococcus bacteria is an important example. Interactions can be central to clinical outcome of the infection, and the epidemiology of one or both. Typically, interactions are studied at two different scales; at the host level in a lab setting, and at the population level in epidemiological data. Experiments in animal models show evidence for strong interaction whereas recent epidemiological studies find only a modest association between the two. Insofar, the understanding at the two levels are discordant. We take a two-pronged approach of quantifying the viral-bacterial interaction at two different scales. First, based on the understanding of kinetics of pathogen-specific immunological dynamics, we construct a within-host model of viral-bacterial interaction that quantifies its timing and intensity. Second, we use a likelihood-based method to infer interaction at the population level in epidemiological data. By taking them together, we strive for a more holistic understanding of the interaction and its consequences for clinical care, pneumococcal epidemiology and pandemic preparedness. (Received January 30, 2012)