SEXUALLY TRANSMITTED INFECTIONS, MATING DYNAMICS AND A BIT OF ALLEE EFFECTS

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Even though many populations commonly reproduce sexually, models developed to describe their dynamics rarely distinguish males and females and thus do not explicitly account for matings. This has obvious consequences for modelling dynamics of sexually transmitted infections (STIs). What kinds of mating system do common STI models represent, if any? An answer to this question also has important repercussions for evolution of STIs and similarly for evolution of mating systems, and even their coevolution. In this talk, I will present a general framework for modelling sexually transmitted infections in animal populations that reproduce sexually. The crucial element of this framework is a consistency between host reproduction and pathogen transmission, since both these elements are mediated by mating. Mating dynamics, as I will demonstrate, thus has a principal impact on dynamics of the host-pathogen system as a whole. Indeed, the assumptions of frequency-dependent vs. density-dependent mating rates lead to completely different host-pathogen dynamics. I will also present some applications of this framework that address some evolutionary aspects of hosts (infection avoidance) or pathogens (stimulation of enhanced propensity to mate in hosts).