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Locally self-organized quasi-critical percolation in multiple disease model

Monday, April 18, 2011 9:00 AM (1 hour)

Diseases emerge, persist and vanish in an ongoing battle for available hosts. Hosts, on the other hand, defend themselves through development of immunity that limits the ability of the pathogens to reinfect old hosts. I will here explore a multi disease system with emphasis on mutual exclusion. I demonstrate that such a system develops towards a steady state, where spreading of individual diseases self-organizes to a state close to that of critical percolation, without any separation of time scale or global control mechanism. For a broad range of introduction rates of new diseases, the likelihood of transmitting diseases remains nearly constant.

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