

Metapopulation epidemic models and complex networks

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Abstract

Networks which trace the activities and interactions of individuals, social patterns, transportation fluxes and population movements on a local and global scale have been analyzed and found to exhibit complex features encoded in large scale heterogeneity, self-organization and other properties typical of complex systems. We review the impact of these complex features on the behavior of epidemic spreading processes. In particular we then report on the effect of the heterogeneity of real world transportation networks in realistic meta-population models for the forecast of the large scale spreading of emerging diseases. The specific cases of SARS, and pandemic influenza are analyzed.