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Transient disease dynamics of some SIR models over patchy environments

This paper deals with the short-term or transient dynamics of some SIR infectious disease models over patchy environments. Employing the measurements of reactivity of equilibrium and amplification rates used in ecology to study the responses of an ecological system to perturbations to an equilibrium, we analyze the impact of dispersals/travels between patches, spatial heterogeneity and other disease-related parameters on the short-term dynamics of these spatial disease models. This is in contrast to most existing works on modelling the dynamics of infectious disease which are only interested in long-term disease dynamics in terms of the basic reproduction number.