

REINFECTION THRESHOLD: A NEW APPROACH

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The reinfection SIRI model describes the spreading of an epidemics in a population of susceptible (S), infected (I), and recovered (R) individuals, where after an initial infection the recovered individuals only have partial immunity against a possible reinfection. Grassberger, Chaté and Rousseau considered similar models with partial immunization, and observed transitions between phases of no-growth, annular growth and compact growth. The first transition between no-growth and annular growth is easily characterized because it is the transition between the disease-free equilibrium and the endemic equilibrium. The reinfection threshold is the transition between annular growth and compact growth, but this threshold was under debate for a while because it is not a sharp threshold.

In this work, we propose a new approach to characterize the reinfection threshold. Our approach is based on the number of infected individuals and on its curvature.

References

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