论文

基于二维规则网格的SIRS病毒传播模型

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摘要：

提出了一个基于二维规则网格的SIRS疾病传播模型，在模型中，研究了群体密度d, 传播效率λ及个体的游动对疾病传播的影响。理论分析和仿真模拟表明该疾病传播模型存在一个临界值(λd)c，只有当群体传播效率和群体密度的乘积λd大于(λd)c时，疾病才能在群体中持续稳定地传播。 另外，研究还发现当群体密度不太大的时候个体的游动更有利于疾病的传播。 根据这些研究结果最后给出了相应的疾病预防和控制措施。

关键词： SIRS模型 疾病传播 仿真模拟

A spreading model of the SIRS virus based on a two-dimensional regular lattice

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Abstract:

A SIRS disease spreading model based on a two-dimensional regular lattice was proposed. For this model, the effects of crowd-density d, spread efficiency λ and the moving activity of agents on the spreading of disease was studied. The theoretical analysis and analog simulation show that there is a critical value (λd)c in this model, and only when the product of spread efficiency and crowd density goes beyond the critical value (λd)c that the disease can spread continuously and steadily in a crowd. Also, the moving activity of agents can promote the spreading of disease in the case of low crowd density. According to these results, measures are presented to prevent the spreading of disease.

Keywords: SIRS model   disease spreading   analog simulation

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