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Analysis of an epidemic model with awareness programs by media on complex networks.

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Summary: We propose an epidemic disease model about the effect of awareness programs on complex networks, where the contacts between nodes are treated as a social network. Two forms on increasing rate of awareness programs, which are a constant and the change with the number of infected individuals, are analyzed. Through dynamical analysis, we obtain the basic reproduction number R_0 and prove the stability of disease-free equilibrium and endemic equilibrium. Furthermore, numerical simulations about the model are taken to reach that, on the one hand, the two forms, which are increasing rate of awareness programs, respectively, have advantages and disadvantages on preventing and controlling diseases, and they are complementary; on the other hand, awareness programs have more effects on nodes with smaller degrees.

MSC:

[92D30](#) Epidemiology

[91D30](#) Social networks; opinion dynamics

[92C42](#) Systems biology, networks

[93C95](#) Application models in control theory

[65C20](#) Probabilistic models, generic numerical methods in probability and statistics

[37N25](#) Dynamical systems in biology

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