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One-Night Stand Land

A stochastic model for the spread of a venereal disease and the mitigating effect of a vaccination scheme

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Abstract

A multi-type stochastic epidemic model is defined as to analyze the spread of a venereal disease within a population, whose members are differentiated with respect to biological sex and sexual preference, with varying disease transmission probability with respect to the sexes of the pair engaged in the contact. The derivation of Ball (1986) for the final size distribution is presented, but simulations are used to determine it. A heuristic motivation for the branching process approximation is given, as well as definitions for the quantities defined in terms of it, i.e. the basic reproduction number and the probability for a major disease outbreak. Considering three cases of venereal diseases, we study the effect of a vaccination scheme as to determine whether certain groups of people should be targeted differently.

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