



Outbreak size distributions in epidemics with multiple stages

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Multiple-type branching processes that model the spread of infectious diseases are investigated. In these stochastic processes, the disease goes through multiple stages before it eventually disappears. We mostly focus on the critical multistage Susceptible-Infected-Recovered (SIR) infection process. In the infinite population limit, we compute the outbreak size distributions and show that asymptotic results apply to more general multiple-type critical branching processes. Finally using heuristic arguments and simulations we establish scaling laws for a multistage SIR model in a finite population.

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