

THE SI AND SIR EPIDEMICS ON GENERAL NETWORKS

David Aldous

Abstract: Intuitively one expects that for any plausible parametric epidemic model, there will be some region in parameter-space where the epidemic affects (with high probability) only a small proportion of a large population, another region where it affects (with high probability) a non-negligible proportion, with a lower-dimensional “critical” interface. This dichotomy is certainly true in well-studied specific models, but we know of no very general results. A recent result stated for a bond percolation model can be restated as giving weak conditions under which the dichotomy holds for an SI epidemic model on *arbitrary* finite networks. This result suggests a conjecture for more complex and more realistic SIR epidemic models, and the purpose of this article* is to record the conjecture.

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