JUNLING MA, University of Victoria
Vaccination on random contact networks

Contact network more realistically represent who contacts who in the population than commonly used homogeneous mixing epidemiological models. We show that the level of herd immunity required on a random contact network is the same as in a homogeneously mixed population if individuals are uniformly chosen for vaccination. However, it is much more efficient to vaccinate individuals with a probability proportional to the number of contacts that one has. The results are derived from a compartmental modeling framework for node removal on contact networks, but the analysis is closely tied to probability generating functions that can be studied with a PDE, and the results have a intuitive probability theory explanation.