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Overview of Networks and Stochasticity in Epidemic Models

Two areas of much recent work in modelling epidemics are contact networks and population stochasticity. These concepts are closely related, since the existence of a small, finite neighbourhood of contacts around each individual (or simple demographic stochasticity) make chance events important at the local level, which can then scale up to significant population-level effects.

This talk will introduce the concepts of network structure and stochasticity, and by focusing on network models, will provide an overview of different mathematical, computational and empirical tools used to address these issues. In particular, the relationship between exact models, approximations based on heuristic arguments, and the results of Monte Carlo simulation will be discussed.