[P20] Spreading dynamics following human interactions

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Spreading dynamics have been studied for many years to understand many social phenomena, such as emerging epidemics, virus outbreaks and information flows. Human activity patterns affecting the spreading processes show high heterogeneity which is often described by a power-law waiting time distribution $P(\tau)\sim\tau^{-\alpha}$, where τ is a time interval between two successive activities. To understand the impact of the power-law waiting time distribution on the spreading dynamics, we here study the susceptible-infected model following heterogeneous interaction patterns in time, through the priority-queue network. We found that the average number of new infection $n(t)$ at time t decays as a power-law in long time limit, $n(t)\sim t^{-\beta}$. These observations are well consistent with both the theoretical prediction by using renewal process and the long prevalence decay time in real social spreading phenomena. Our results imply that heterogeneity in human interactions is an essential factor to model spreading dynamics.