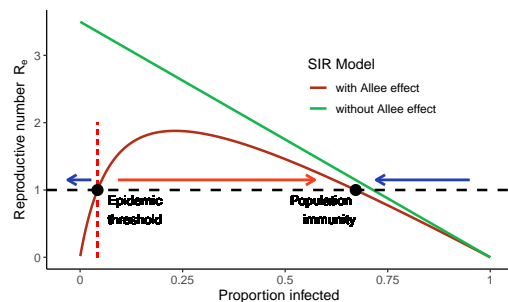


a

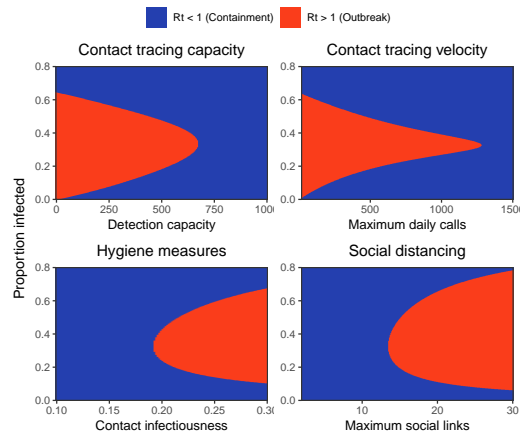
Non-pharmaceutical interventions (NPIs)
induce an Allee effect on disease dynamics

$$R_e = P_{\text{susceptible}} \cdot b_{\text{link}}(L \cdot f_q + L_{\text{max}} \cdot f_{nq})$$



b

Transition between dynamic states is determined by
the strength of NPIs and the proportion of infected individuals



c

Simulated dynamics with an NPI-induced Allee effect
often show sharp accelerations after slow initial spread

Simulated SIR Dynamics

$$\begin{aligned} S(t+1) &= S(t) - I_{\text{new}}(t) \\ I(t+1) &= I(t) + I_{\text{new}}(t) - \frac{I(t)}{\tau(I(t))} + I_{\text{imp}}(t) \\ R(t+1) &= R(t) + \frac{I(t)}{\tau(I(t))} \\ I_{\text{new}}(t) &\sim \text{Poisson}(\lambda) \\ \lambda &= \frac{\beta(I(t))I(t)P(t)}{N} \\ I_{\text{imp}}(t) &\sim \text{NB}(\mu, \sigma) \end{aligned}$$

