

Table S1: Model notations

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| $\dot{f}(x, t) = \frac{\partial}{\partial t} f(x, t)$ | partial derivative of function f with respect to t |
| $f^{(a,b)}(x, y, t) = \frac{\partial^a}{\partial x^a} \frac{\partial^b}{\partial y^b} f(x, y, t)$ | partial derivative of function f a times with respect to x and b times with respect to y |
| A_{kl} | number of individuals in group A with k contacts and l interaction events (per time interval) |
| $A = \sum_{k,l} A_{kl}$ | number of individuals in group A |
| $N_{kl} = \sum_A A_{kl}$ | number of individuals with k contacts and l interaction events (per time interval) |
| $N = \sum_{k,l} N_{kl}$ | total number of individuals |
| $P_{Akl} = \frac{A_{kl}}{A}$ | probability for an individual in group A to have k contacts and l interaction events per time interval |
| $G_A(x, y, t) = \sum_{k,l} P_{Akl}(t) x^k y^l$ | probability generating function (PGF) of $P_{Akl}(t)$ |
| $\langle k \rangle_A = G_A^{(1,0)}(1, 1, t)$ | average number of contacts of A individuals |
| $\langle l \rangle_A = G_A^{(0,1)}(1, 1, t)$ | average number of interaction events per time interval of A individuals |
| $\langle kl \rangle_A = G_A^{(1,1)}(1, 1, t)$ | average number of contacts times interaction events per time interval of A individuals |
| $P_{kl} = \frac{N_{kl}}{N}$ | probability for an individual to have k contacts and l interaction events per time interval |
| $G(x, y, t) = \sum_{k,l} P_{kl}(t) x^k y^l$ | probability generating function (PGF) of $P_{kl}(t)$ |
| $= \sum_A \frac{A}{N} G_A(x, y, t)$ | |
| $\langle k \rangle = G^{(1,0)}(1, 1, t)$ | average number of contacts of individuals |
| $M_A = \sum_{k,l} k A_{kl} = A G_A^{(1,0)}(1, 1, t)$ | number of links coming from A individuals |
| $M = \sum_A M_A$ | number of links |
| M_{AB} | number of links coming from A individuals and pointing to B individuals |
| $p_{AB} = \frac{M_{AB}}{M_A}$ | probability for an undirected link starting from an A individual to point to an B individual |

A, B correspond to epidemic stages, i.e. S, I, R for susceptible, infected, recovered