A multi-community epidemic model with central infection place

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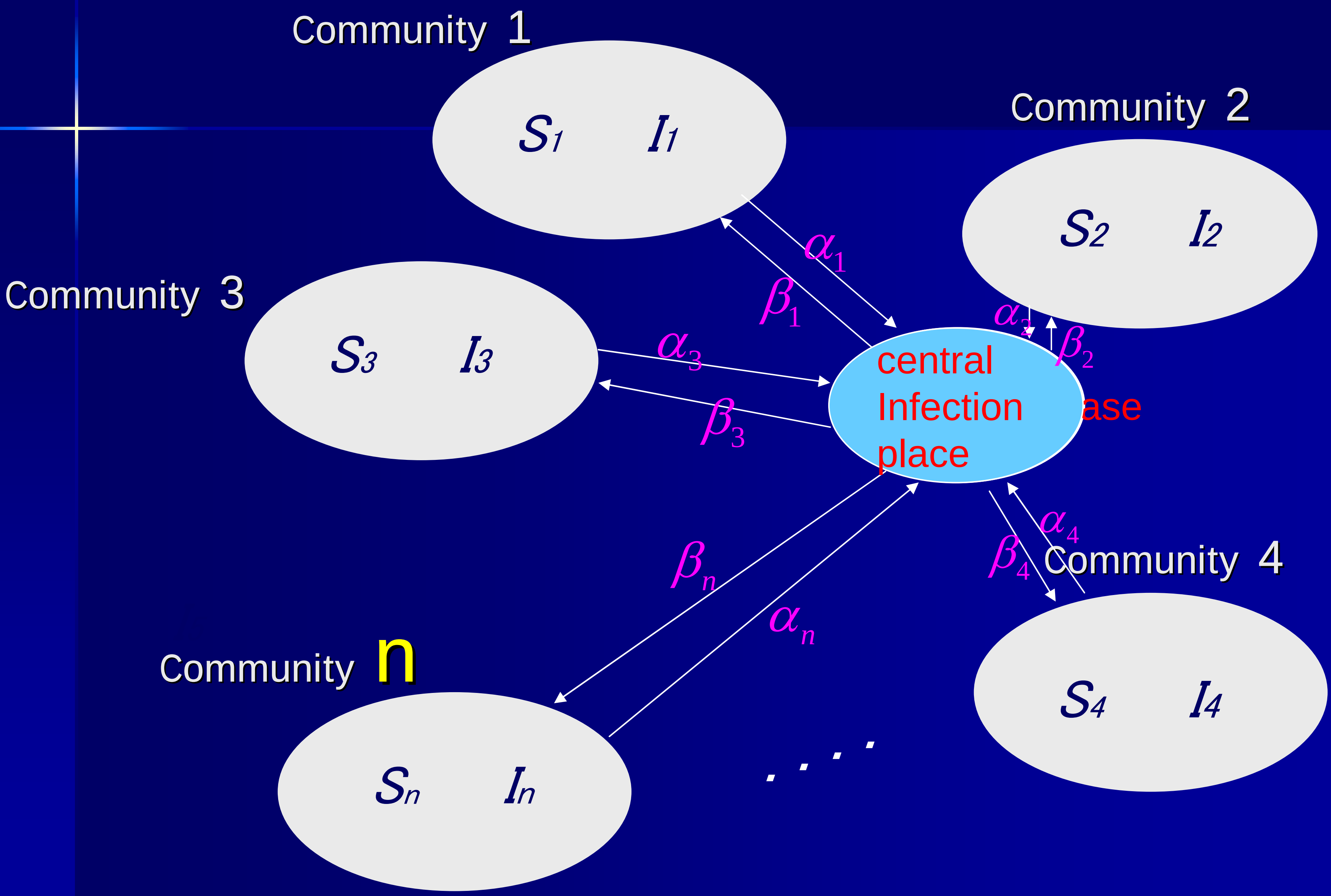
One traveling phase and identical n communities with different phase-transition rates



$$S_i' = B(N)S_i - \frac{\gamma S_i I_i}{S_i + I_i} + \mu I_i - \alpha_S^i S_i + \beta_S^i \tilde{S}_i,$$

$$I_i' = \frac{\gamma S_i I_i}{S_i + I_i} - (\mu + D + \alpha_I^i) I_i + \beta_I^i \tilde{I}_i,$$

$$\tilde{S}_i' = -\frac{\tilde{\gamma} \tilde{S}_i \sum_{k=1}^{n} \tilde{I}_k}{\sum_{k=1}^{n} (\tilde{S}_k + \tilde{I}_k)} + \alpha_S^i S_i - \beta_S^i \tilde{S}_i,$$

$$\tilde{I}_i' = \frac{\tilde{\gamma} \tilde{S}_i \sum_{k=1}^{n} \tilde{I}_k}{\sum_{k=1}^{n} (\tilde{S}_k + \tilde{I}_k)} + \alpha_I^i I_i - \beta_I^i \tilde{I}_i, \qquad i = 1, 2, \cdots, n.$$

☆No birth and
no death in traveling !

- *B(N) is the population growth.*
- *Different phase-transition rates!*

We obtain the basic reproduction ratio obtained as an explicit formulas of model parameters, which is mainly given by

$$\Theta_i = \frac{\alpha_I^i + \mu + D}{\beta_I^i}, \quad i = 1, \Lambda\ n$$

: *Infective transfer index*

We discuss…

☆*Dependence of some public health control against a disease invasion on the population-size distribution among communities in DFE.*

For more details…

See you

in front of our poster!