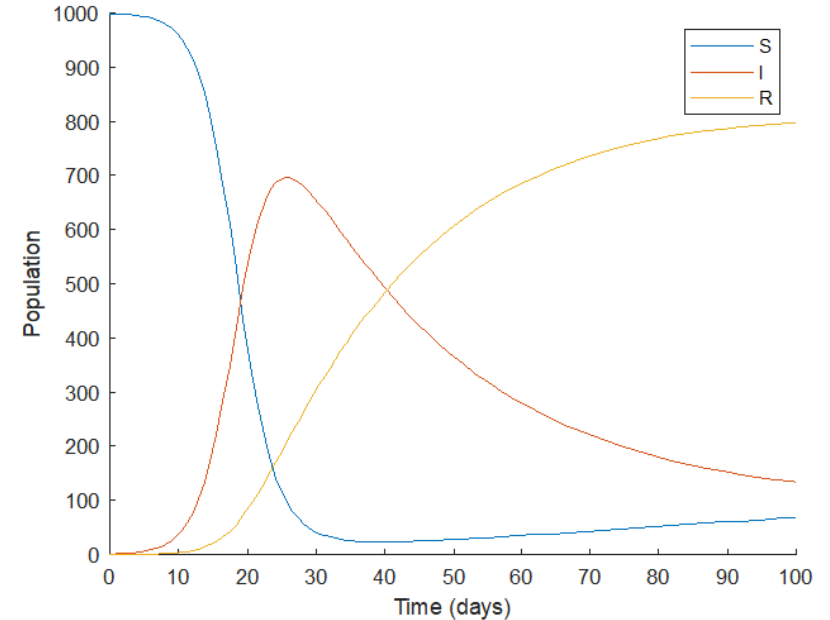# Sensitivity of SIR nonlinear models for COVID-19: numerics, dynamics and policies

$$\frac{dS_i}{dt} = \mu N_i - \frac{\beta_i S_i I_i}{N_i} - \mu S_i + \sum_{j=1}^{n} \theta_{ij} S_j$$

$$\frac{dI_i}{dt} = \frac{\beta_i S_i I_i}{N_i} - (\mu + \gamma) I_i + \sum_{j=1}^{n} \theta_{ij} I_j$$

$$\frac{dR_i}{dt} = \gamma I_i - \mu R_i + \sum_{L}^{n} \theta_{ij} R_j$$

S – Susceptible
I – Infected
R – Recovered/Removed
N – Total Population
μ – rate of birth/death
β – rate of transmission
γ – rate of recovery
θ – rate of movement

R_0 = 2.3

R_0 = 1.6

R_0 = 0.90