COVID19 SIR MODEL EQUATIONS

1 Covid19 Model Equations

These are the equations for the model:

$$\frac{dS}{dt} = -\beta_0 * I_0 * \frac{S}{N} - \delta_0 - \beta_1 * I_1 * \frac{S}{N} - \delta_1 - \beta_2 * I_2 * \frac{S}{N} - \delta_2$$

$$\frac{dI_0}{dt} = \beta_0 * I_0 * \frac{S}{N} - \gamma_0 I_0 + \delta_0 + \beta_{0,0} * I_0 * \frac{R_0}{N} + \beta_{1,0} * I_0 * \frac{R_1}{N} + \beta_{2,0} * I_0 * \frac{R_2}{N}$$

$$\frac{dI_1}{dt} = \beta_1 * I_1 * \frac{S}{N} - \gamma_1 I_1 + \delta_1 + \beta_{0,1} * I_1 * \frac{R_0}{N} + \beta_{1,1} * I_1 * \frac{R_1}{N} + \beta_{2,1} * I_1 * \frac{R_2}{N}$$

$$\frac{dI_2}{dt} = \beta_2 * I_2 * \frac{S}{N} - \gamma_2 I_2 + \delta_2 + \beta_{0,2} * I_2 * \frac{R_0}{N} + \beta_{1,2} * I_2 * \frac{R_1}{N} + \beta_{2,2} * I_2 * \frac{R_2}{N}$$

$$\frac{dR_0}{dt} = \gamma_0 * I_0 - \beta_{0,0} * I_0 * \frac{R_0}{N} - \beta_{0,1} * I_1 * \frac{R_0}{N} - \beta_{0,2} * I_2 * \frac{R_0}{N}$$

$$\frac{dR_1}{dt} = \gamma_1 * I_1 - \beta_{1,0} * I_0 * \frac{R_1}{N} - \beta_{1,1} * I_1 * \frac{R_1}{N} - \beta_{1,2} * I_2 * \frac{R_1}{N}$$

$$\frac{dR_2}{dt} = \gamma_2 * I_2 - \beta_{2,0} * I_0 * \frac{R_2}{N} - \beta_{2,1} * I_1 * \frac{R_2}{N} - \beta_{2,2} * I_2 * \frac{R_2}{N}$$