

S1 Text

Ordinary differential equation systems of BD, SIR and BDEI models.

In the following ordinary differential equation systems of BD (Eq. S1), SIR (Eq. S2) and BDEI (Eq. S3) models, $S(t)$, $E(t)$, $I(t)$ and $R(t)$ respectively denote the number of Susceptible, Exposed, Infectious and Removed individuals at time t .

$$\frac{dI(t)}{dt} = \beta I(t) - (\gamma + \varepsilon)I(t) \quad (\text{S1})$$

$$\frac{dS(t)}{dt} = -\beta \frac{S(t)}{N} I(t) \quad (\text{S2a})$$

$$\frac{dI(t)}{dt} = \beta \frac{S(t)}{N} I(t) - (\gamma + \varepsilon)I(t) \quad (\text{S2b})$$

$$\frac{dR(t)}{dt} = (\gamma + \varepsilon)I(t) \quad (\text{S2c})$$

$$\frac{dE(t)}{dt} = \beta I(t) - \sigma E(t) \quad (\text{S3a})$$

$$\frac{dI(t)}{dt} = \sigma E(t) - (\gamma + \varepsilon)I(t) \quad (\text{S3b})$$