

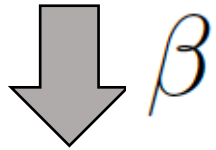
**Kermack &
McKendrick
(1927)**

Bilinear Incidence Rates

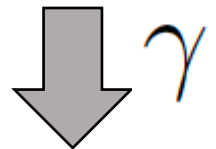
**Liu, et al.
(1987)**

Nonlinear Incidence Rates

**Susceptible
(S)**

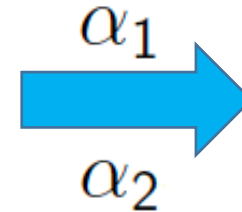


**Infectious
(I)**

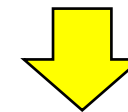


**Removed
(R)**

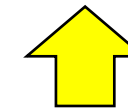
$$\frac{dS(t)}{dt} = -\beta I(t)S(t)$$



$$\frac{dS(t)}{dt} = -\beta I(t)^{\alpha_1} S(t)^{\alpha_2}$$



$$Y_t \sim \text{Poisson}(\mu_t)$$
$$\log(\mu_t) = \log(\beta) + \alpha_1 \log(I_{t-1}) + \alpha_2 \log(S_{t-1}/N)$$



Epidemic Data

$$\frac{dI(t)}{dt} = \beta I(t)S(t) - \gamma I(t)$$

$$\frac{dR(t)}{dt} = \gamma I(t)$$