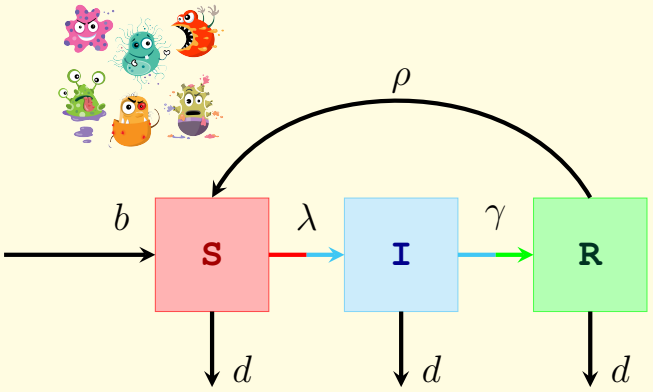


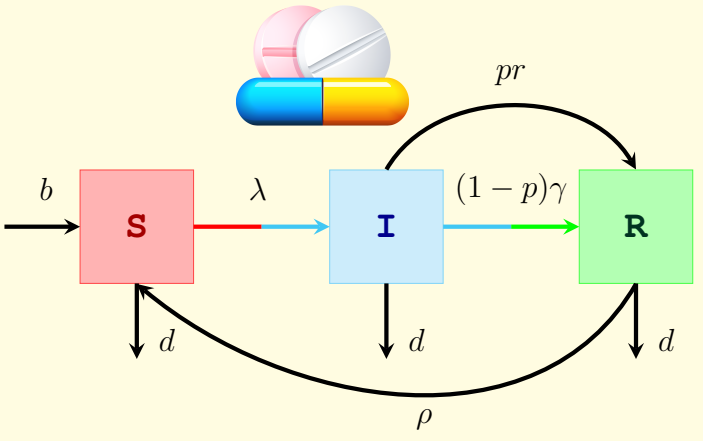
Loss of Immunity **SIRS** Measles Model

System of ODEs

$$\frac{d\mathbf{S}}{dt} = b\mathrm{N} - \beta\mathbf{IS} - d\mathbf{S} + \rho\mathbf{R} \tag{1.1}$$

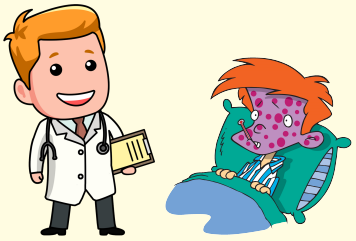
$$\frac{d\mathbf{I}}{dt} = \beta\mathbf{IS} - \gamma\mathbf{I} - d\mathbf{I} \tag{1.2}$$

$$\frac{d\mathbf{R}}{dt} = \gamma\mathbf{I} - d\mathbf{R} - \rho\mathbf{R} \tag{1.3}$$



p people have access to treatment and $(1-p)$ people do not.

r represents the drug recovery rate.



Drug Therapy **SIRSBD** Measles Model 1

System of ODEs

We define the parameter $\mu = d = b$.

$$\frac{d\mathbf{S}}{dt} = \mu\mathrm{N} - \beta\mathbf{IS} - \mu\mathbf{S} + \rho\mathbf{R} \tag{1.4}$$

$$\frac{d\mathbf{I}}{dt} = \beta\mathbf{IS} - pr\mathbf{I} - \mu\mathbf{I} - (1-p)\gamma\mathbf{I} \tag{1.5}$$

$$\frac{d\mathbf{R}}{dt} = pr\mathbf{I} - \mu\mathbf{R} - \rho\mathbf{R} + (1-p)\gamma\mathbf{I} \tag{1.6}$$