

Day 21: Disease ecology

1. In the equation for the rate of change in susceptibles:

a) Why is I in the equation?

b) Why is there a negative sign?

2. In the equation for the rate of change in infected individuals, why are there two terms on the right side of the equation?

3. Calculate R_0 for each of the following situations:

one transmission occurs every 2 days, and individuals are infectious for 3 days

transmissions occur twice per day, and the rate of death or recovery is 0.20 (20%)

4. What is the threshold density for a disease to spread in each of the following cases?

a) It takes 3 days for an infected individual to recover. During this time, the transmission rate is 0.001.

b) A disease has a rate of death or recovery of 0.5 (50%), and a transmission rate of 0.01.