

## Parameter Glossary

$N$	Total population size.
$X, W, Y, Z$	Number of susceptible, exposed, infectious, and recovered individuals.
$X_A, Y_A$ etc	Number of susceptible, infectious individuals who also belong to class/species/population $A$ . (Chapters 3 and 4)
$S, E, I, R$	Proportion of population that are susceptible, exposed, infectious, and recovered. ( $S = X/N$ , etc).
$n_A$	Proportion of entire population that belong to class $A$ . (Chapter 3)
$S_A, I_A$	$S_A$ is the proportion of the entire population that belongs to both the susceptible class and to class $A$ . $I_A$ is similarly defined (Chapters 3)
$\beta$	Transmission rate of infection.
$\beta_{AB}$	Transmission rate of infection to class/species $A$ from class/species $B$ . (Chapters 3 and 4)
$\gamma$	Recovery rate. $1/\gamma$ is the infectious period.
$\sigma$	Rate of moving from exposed to infectious class. $1/\sigma$ is the latent period.
$\mu$	Natural per capita death rate.
$\nu$	Birth rate; often we assume $\nu = \mu$ .
$R_0$	Basic reproductive ratio; average number of secondary cases produced by an average infectious individual in a totally susceptible population.
$R_\infty$	Final epidemic size; expected proportion of the population infected in a simple epidemic.
$A$	Average age of first infection.
$p$	Proportion of the population vaccinated at birth.
$v$	Rate of vaccination of susceptibles.
$\rho$	Mortality probability; probability of dying due to infection before recovery.
$m$	Disease-induced mortality rate; increased rate of mortality due to infection.
$w$	Rate of waning immunity; rate of moving from recovered to susceptible classes.
$l_A$	Rate at which individuals mature and leave class $A$ for the subsequent class; $1/l_A$ is the average amount of time spent in class $A$ . (Chapter 3)
$N_{SI}$ etc	The proportion of the population that are in state $S$ with respect to disease 1 and state $I$ with respect to disease 2. (Chapter 4)

$b$	Bite rate of mosquitoes or other vectors. (Chapter 4)
$T_{AB}$	Transmission probability to species $A$ from species $B$ per vector bite. (Chapter 4)
$\beta_1$	Relative amplitude of sinusoidal transmission forcing. (Chapter 5)
$b_1$	Relative amplitude of term-time transmission forcing. (Chapter 5)
$\delta$	Stochastic rate at which infectious imports join a population. (Chapter 6)
$\varepsilon$	Stochastic rate at which susceptibles are infected due to imports from an external population. (Chapter 6)
$\rho_{ij}$	Degree of spatial interaction to population $i$ from population $j$ . (Chapter 7)
$K(d)$	Transmission kernel; measures how the risk of infection declines with distance $d$ between an infectious and susceptible individual. (Chapter 7)
$\xi$	Normally distributed error rate (Chapter 6).