I. ALGORITHMS

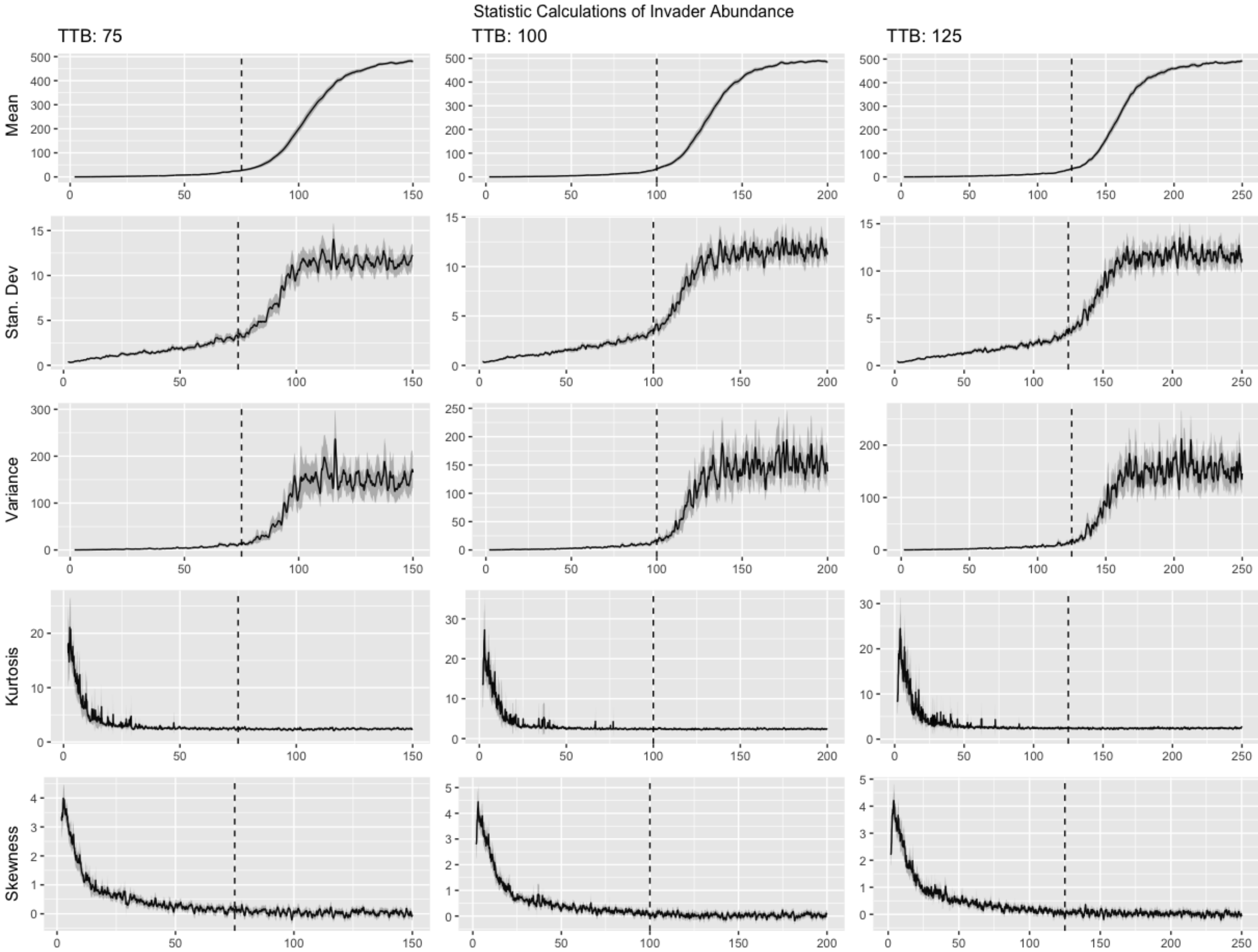
Algorithm 1 τ-Leap Method

$\mathbf{N} \leftarrow c(\text{initial } N_i, \text{initial } N_j)$
time $\leftarrow 0$
while time $<$ time.max **do**
    $a_1 = \text{Poisson}(\tau \times c(\beta_i N_i, \beta_j N_j))$
    $a_2 = \text{Poisson}(\tau \times c(\frac{\beta_i}{K_i} N_i^2, \frac{\beta_j}{K_j} N_j^2))$
    $a_3 = \text{Poisson}(\tau \times c(\alpha_{12} \frac{\beta_i}{K_i} N_i N_j, \alpha_{21} \frac{\beta_j}{K_j} N_j N_i))$
    $a_4 = \text{Poisson}(\tau \times c(\delta_i, \delta_j))$
    $\Delta\mathbf{N} = a_1 - a_2 - a_3 + a_4$
    $\mathbf{N} \leftarrow \mathbf{N} + \Delta\mathbf{N}$
    time $\leftarrow$ time $+ \tau$
end while

Algorithm 2 alphaSim(model params., TTB, ratio.max)

$\mathbf{N} \leftarrow c(\text{initial } N_i, \text{initial } N_j)$
time $\leftarrow 0$
step $\leftarrow 1$
time.max $\leftarrow$ TTB $\times 2$
num.step $\leftarrow$ as.integer(time.max/tau)
ratio.set $\leftarrow$ seq(0,ratio.max, by ratio.max/num.step)
while time $<$ time.max **do**
    $\alpha_{21} \leftarrow \alpha_{12}/$**ratio.set**[step]
    $a_1 = \text{Poisson}(\tau \times c(\beta_i N_i, \beta_j N_j))$
    $a_2 = \text{Poisson}(\tau \times c(\frac{\beta_i}{K_i} N_i^2, \frac{\beta_j}{K_j} N_j^2))$
    $a_3 = \text{Poisson}(\tau \times c(\alpha_{12} \frac{\beta_i}{K_i} N_i N_j, \alpha_{21} \frac{\beta_j}{K_j} N_j N_i))$
    $a_4 = \text{Poisson}(\tau \times c(\delta_i, \delta_j))$
    $\Delta\mathbf{N} = a_1 - a_2 - a_3 + a_4$
    $\mathbf{N} \leftarrow \mathbf{N} + \Delta\mathbf{N}$
    time $\leftarrow$ time $+ \tau$
end while

II. FIGURES



	Initial N	Birth Rate	Carrying Cap.	Initial Inter.	Intra.	Immigration
endemic	500	0.65	500	1	1	0
invader	0	0.65	500	1	1	2

	Tau	Invasion Time	Window (tau)	Step (tau)	Realizations
value	1/52	0	100	3	50

FIG. 1: Right-handed statistics across 3 TTBs.

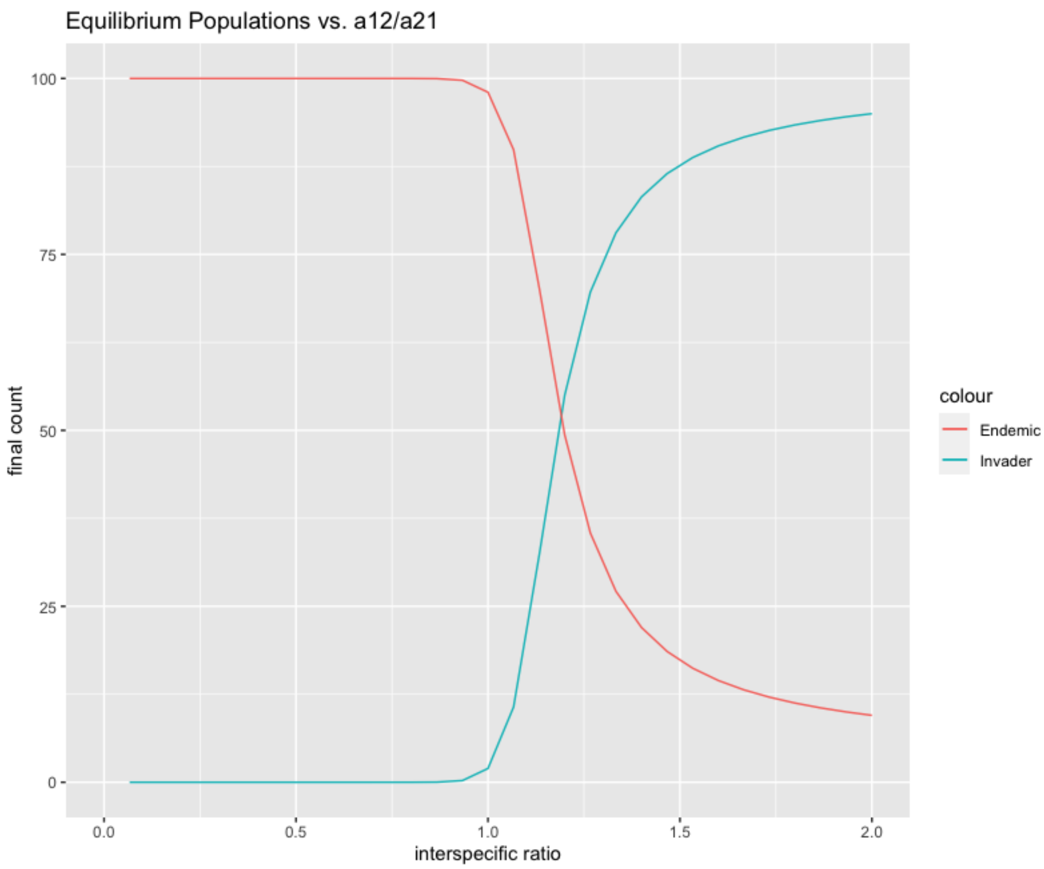


FIG. 2: Equilibrium values for differing ratios.

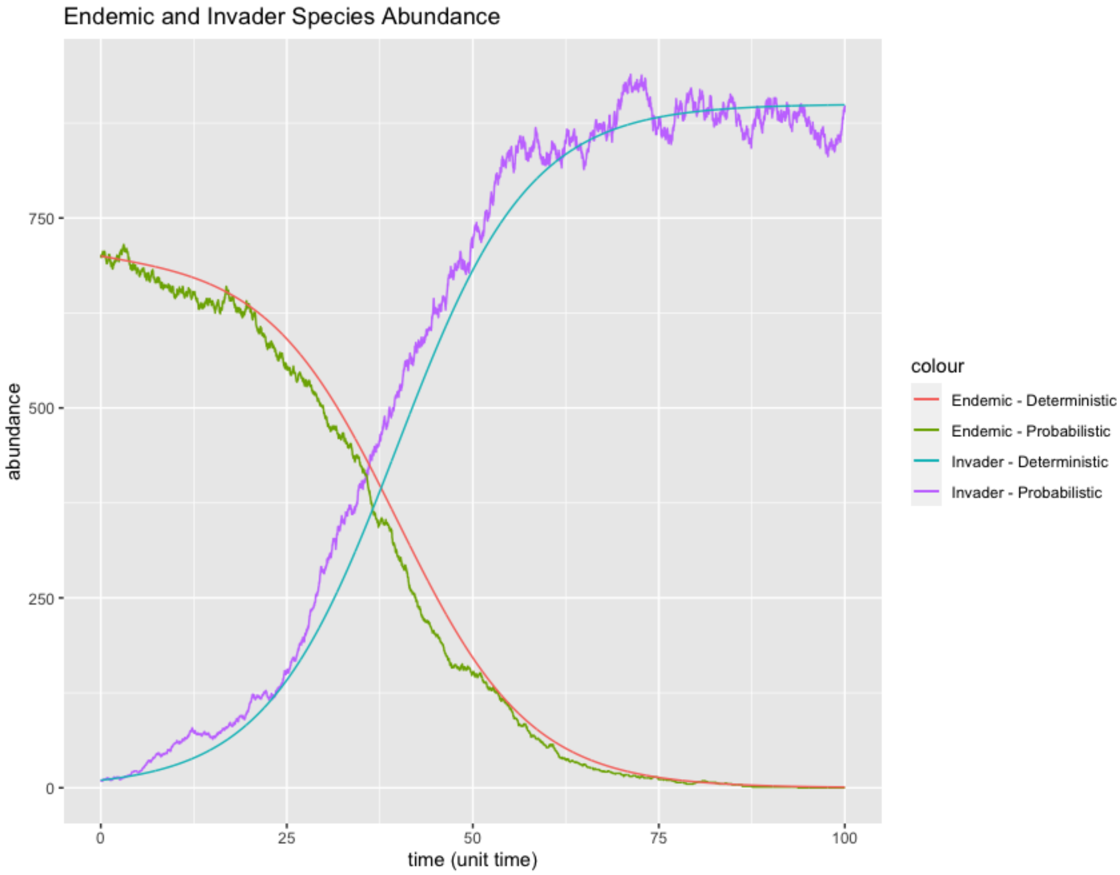


FIG. 3: Comparison of the deterministic and stochastic models.