

Assignment 4

Exercise 1 Herd Immunity Threshold

Exercise 2

SIR competition

Using invasion analysis, we can show that for one pathogen to invade another in a SIR model with demography and no coinfection, it needs to have a higher R_0 . We could also formally show that when there are two competing pathogens with different R_0 values in this model, the one with the greater R_0 will outcompete the other. How is this result consistent with the competitive exclusion principle? Use mathematical notation and explain in terms of the resource use of each species.