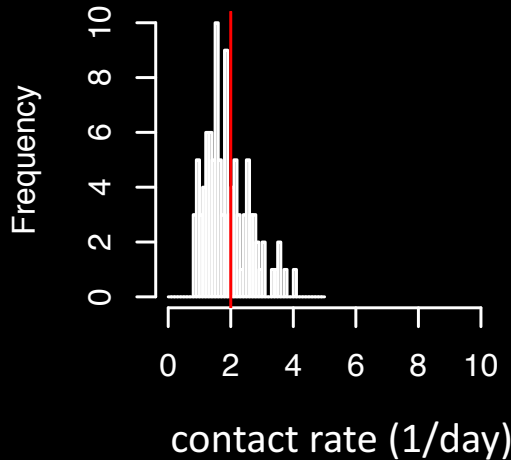


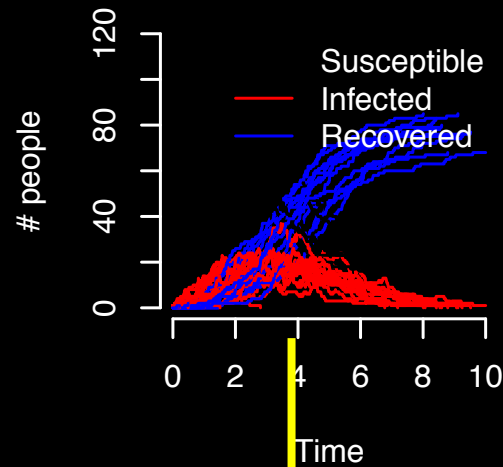
het.epidemic(beta.mean = 2, **beta.var = .5**, runs = 30, end.time = 10, pop.size = 100, gmma = 1)

het.epidemic(beta.mean = 2, **beta.var = 8**, runs = 30, end.time = 10, pop.size = 100, gmma = 1)

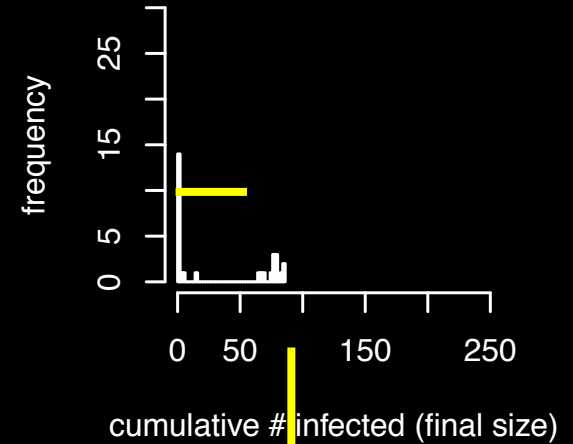
**distribution of average R**



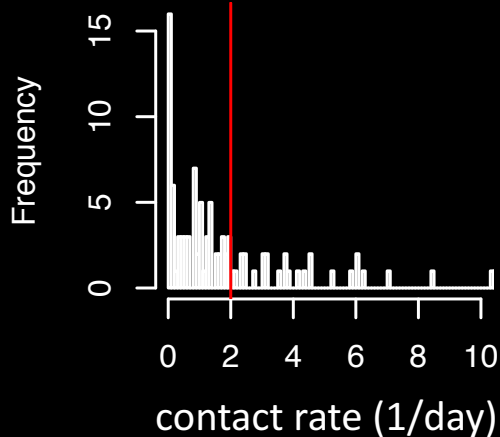
**time series**



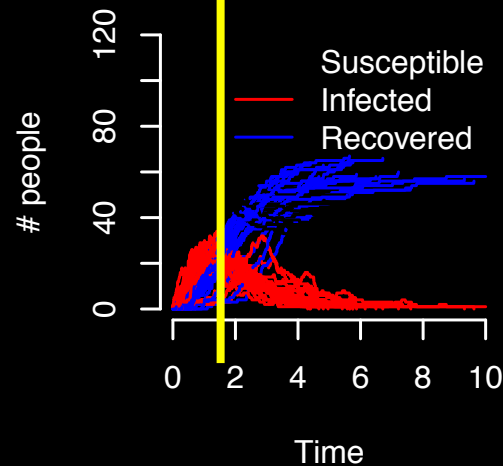
**outbreak size distribution**



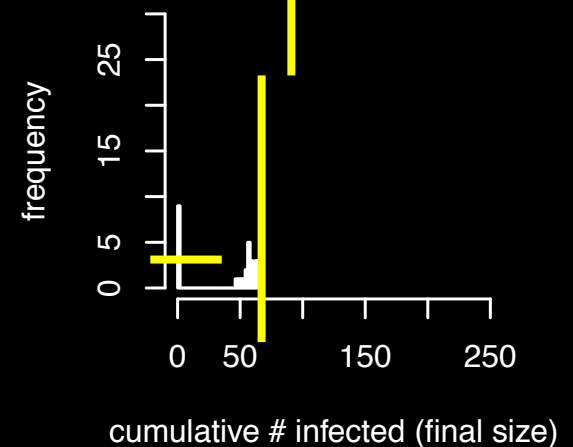
**distribution of average R**



**time series**



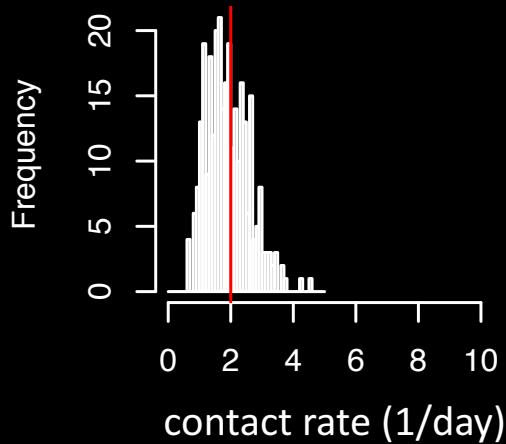
**outbreak size distribution**



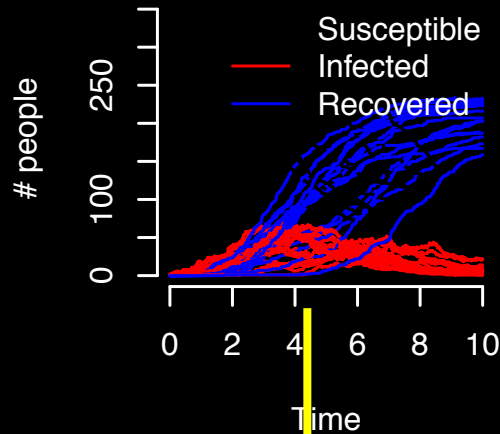
het.epidemic(beta.mean = 2, **beta.var = .5**, runs = 30, end.time = 10, **pop.size = 300**, gmma = 1)

het.epidemic(beta.mean = 2, **beta.var = 8**, runs = 30, end.time = 10, **pop.size = 300**, gmma = 1)

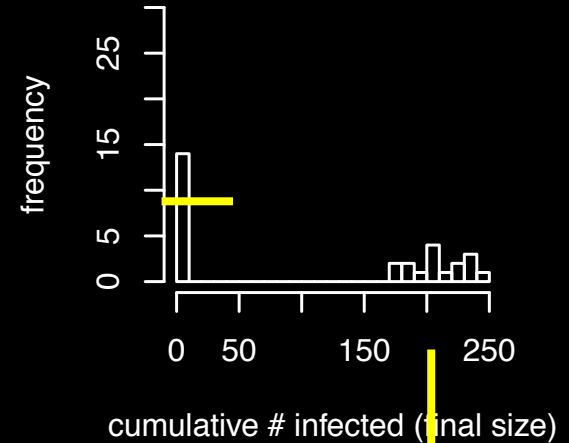
**distribution of average R**



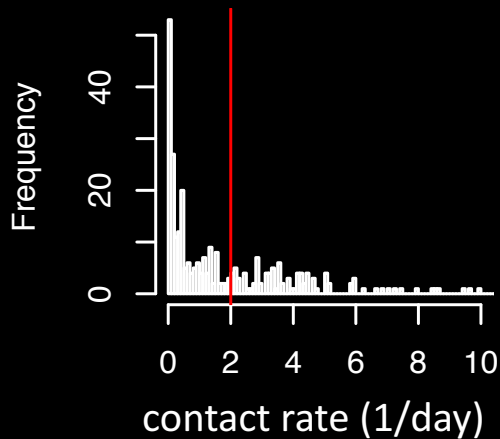
**time series**



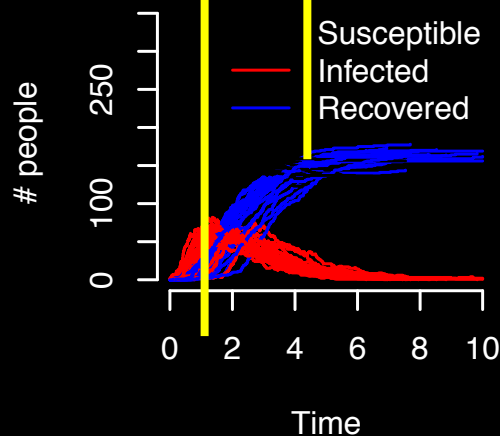
**outbreak size distribution**



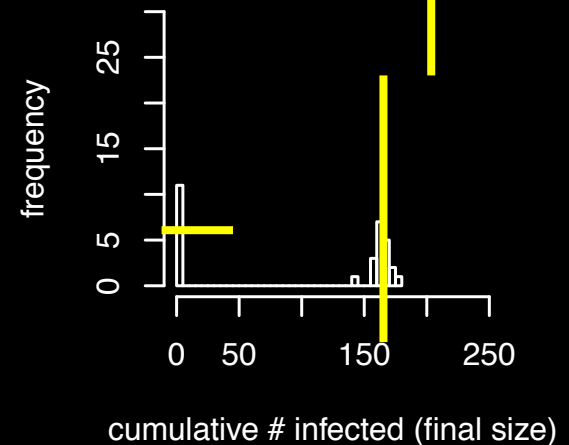
**distribution of average R**



**time series**



**outbreak size distribution**



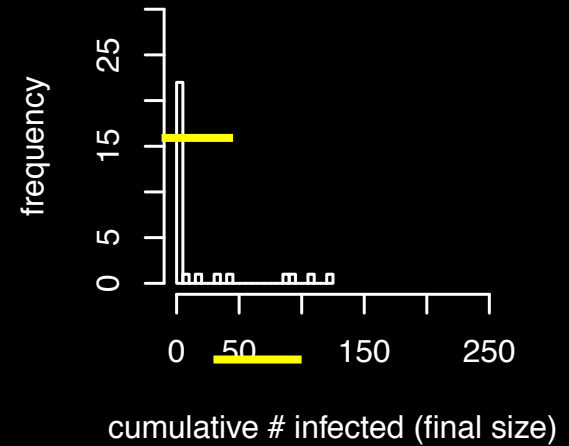
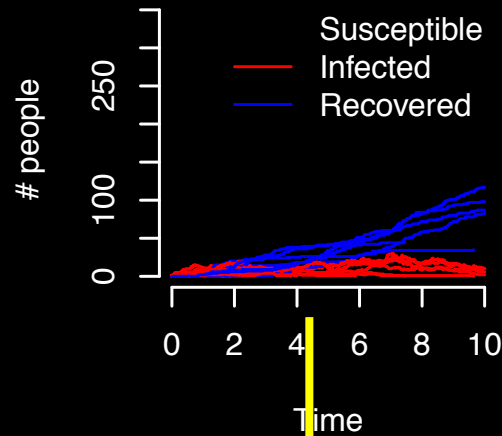
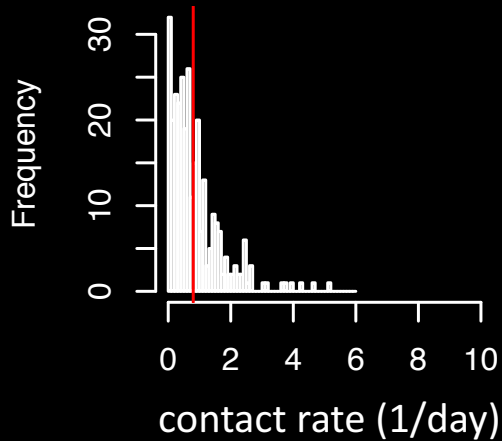
het.epidemic(beta.mean = .8, beta.var = .5, runs = 30, end.time = 10, pop.size = 300, gmma = 1)

het.epidemic(beta.mean = .8, beta.var = 8, runs = 30, end.time = 10, pop.size = 300, gmma = 1)

distribution of average R

time series

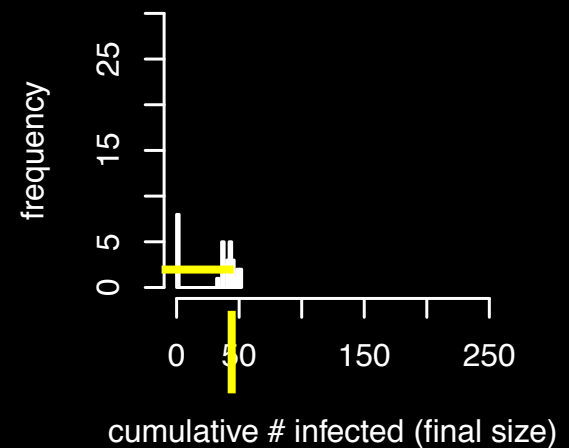
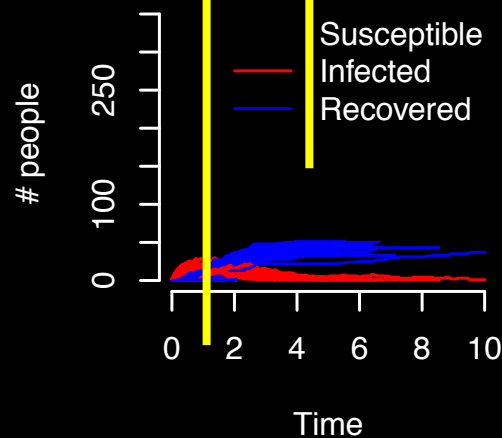
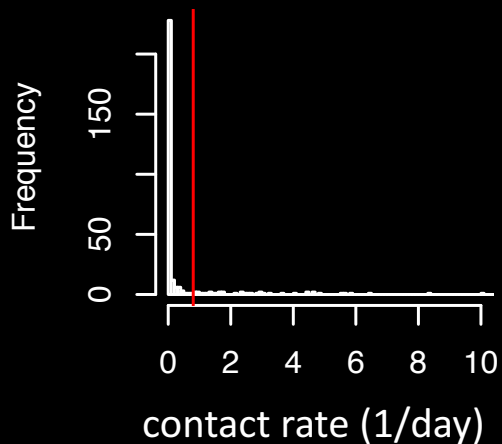
outbreak size distribution



distribution of average R

time series

outbreak size distribution



# Summary

- Heterogeneity makes pathogens
  - more likely to invade
  - smaller epidemics
  - faster epidemics
  - faster initial rate of increase