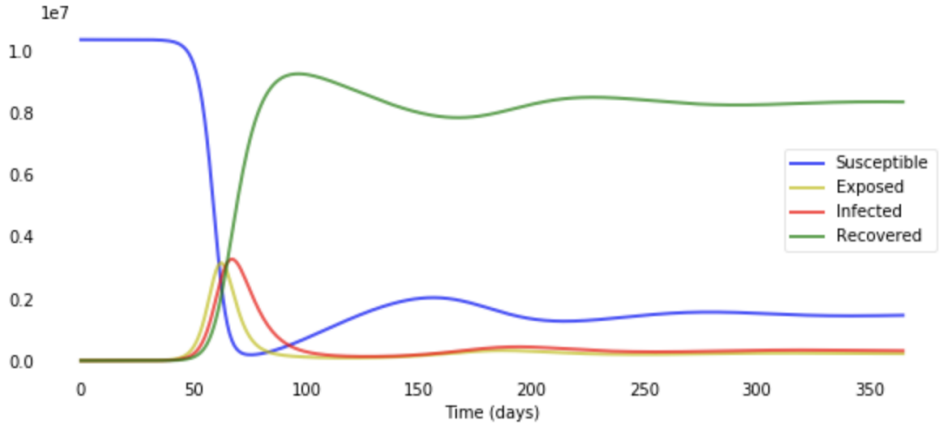
N = 10336399 # population of Sweden (January 2020 source: www.scb.se) delta = 1.0 / 5.0 # incubation period of five days D = 7.0 # number of days that an infected person has and can spread the disease gamma = 1.0 / D # removal rate

alpha = 1/180 # immunity lost after six months

beta = 1 # constant

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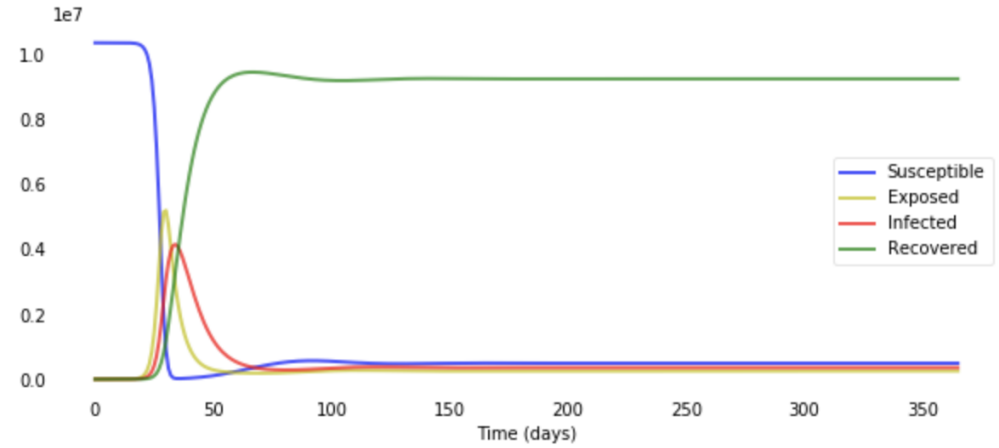
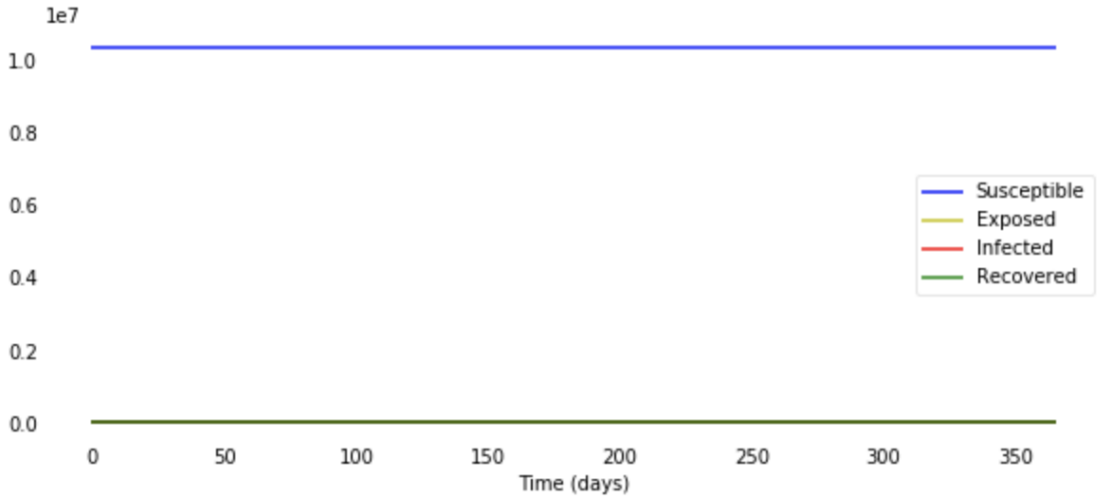
beta = 3, alpha = 1/180 # immunity lost after six months

increasing the transmission rate three times resulting in higher number of infection



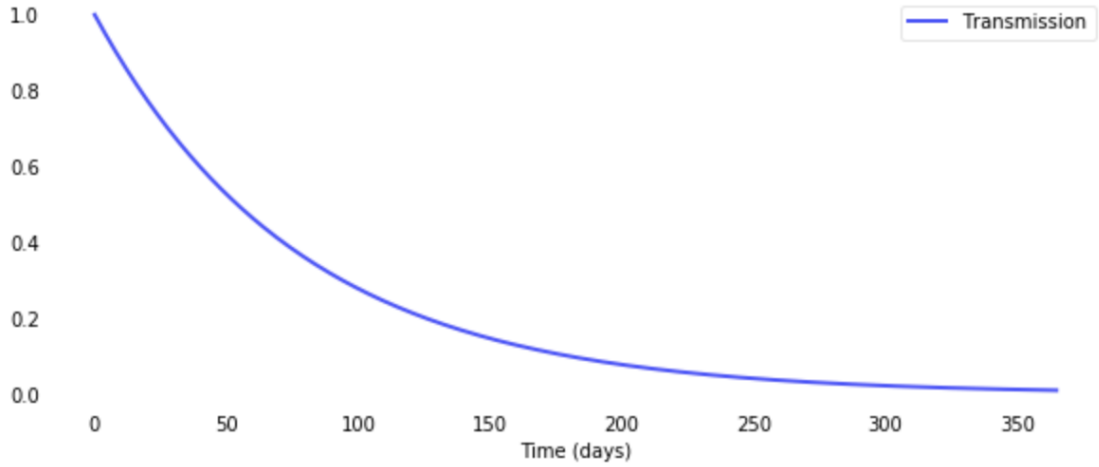

beta = 0.1 , alpha = 1/180 # immunity lost after six months

dereasing the transmission rate to a very low level, the disease never spreads

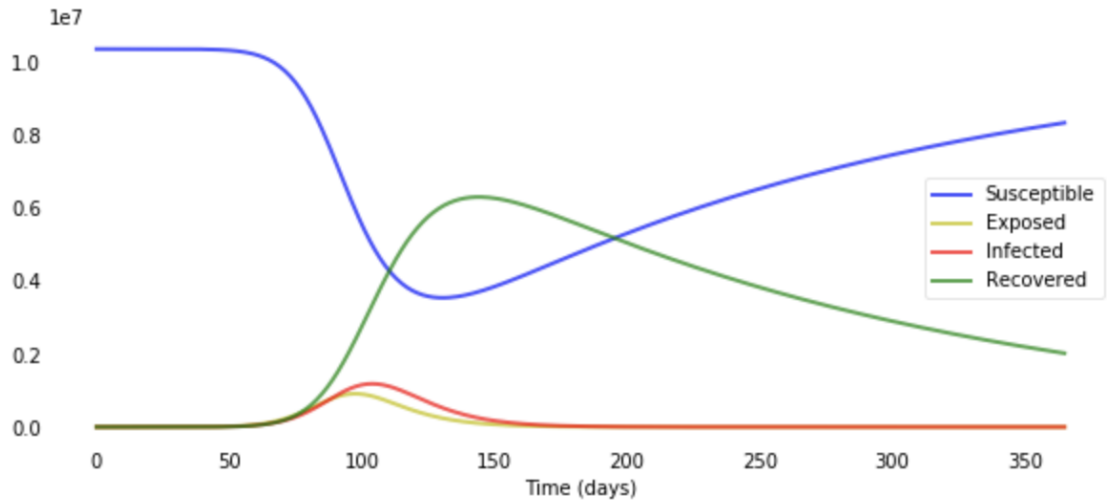



alpha = 1/180 # immunity lost after six months

Changing beta to a time varying transmission rate, assuming it starts from 1 and slowly decreasing over time to close to 0 by the end of the year




A time decreasing transmission rate (perhaps due to policy or ppl's voluntary social distancing) significantly lowers the number of exposed and infected, but a large portion of population remains susceptible to the disease.


1e7
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
250
300
350
Time (days)
Susceptible
Exposed
Infected
Recovered