1 Parameters

- T_{inc}: mean incubation time in days. I am using 5.2 as in the SIREV paper.
- T_{inf}: mean infectious time in days. I am using 2.9 as in the SIREV paper.
- R_0: 1.8 to model a "new normal" as in the SIREV paper.
- Initial SEIR state for each population: obtained roundig (down) the values obatining from SP: S0=0.685751 E0=0.009905 I0=0.005572 R0=0.298772. This was obtained using a subnotification factor of 7.6 to match the recovred proportion described in a recent sorolo inquiry published in Folha.

  I am using then $S0 = 68.5\%, E0 = 1.0\%, I0 = 0.6\%, R0 = 29.9\%$. I will assume that the subpopulations will conform to this distribution according to their size.
- The time window to choose a different social distancing profile (r_t). I am using 14 days as before.
- The age groups: The age groups will be $[0, 19]$, $[20, 49], [50, 64], [65, \infty)$.
- Relative size of each subpopulation. Using the census from 2010 in SP, I get to: 30%, 48%, 14%, 8%.
- Mean ICU time: I am using 7 days in the Robot test paper.
- Number of ICUs available (Claudia): population = 44,639,899, Available ICU 7812. Ratio of Available ICU = 0,0175% (or 17.5 for 100K habitants).
- Mean ICU demand: SP data suggest mean ICU necessity of 0.00956607 (the ratio ICU_t in SiRev). The time series would be this constant value plus a white noise with standard deviation 0.00399146, both scaled. Since I am using "rounded" versions of SP data in this test I will employ ratio 1% and the standard deviation of the white noise equal 0.004. But we still need to come up with a way to derive from these numbers the ICU necessity of each population.
- Factor to correct ICU demand: $[0, 19]$: 0.06, $[20, 49]$: 0.58, $[50, 64]$: 2.06 e $[65, 200]$: 5.16.
- The number of days needed for one and two doses to make effect: 14 days for both (Claudio, Tiago). This is the amount of time after the vaccine that allow the transition for the lower states.
- Minimum number of days before the second dose (I am assuming that it is at least $T_{inc}/2$ longer than the number of days needed for the vaccine to make effect): 28 (Claudio, Tiago).
- Maximum number of days between the two doses: 3 months = 90 days.

- Number of vaccines doses that can be deployed each day (as a proportion of the population size): 0.1% for 30 days (up to March), 0.5% from 31 to 150 (March to June) 1.5% from there on (Claudio, Tiago).
- How much the number of doses attenuate the need for ICU beds. If used I will go with 50% for one dose and 70% for two doses. (Claudio, Tiago).
- a_p: How much one and two doses attenuate transmission: again 50% and 70% if used. (Claudio, Tiago)
- b_p: A factor to multiply the overall $R0$ of each subpopulation to say whether subpopulation p is more or less susceptible than the overall population: I will use 1.0 for $[0, 19]$, 1.3 for $[20, 49]$, 1.0 for $[50, 64]$ and 1.0 for $[65, \infty)$. (Claudio, Tiago).
- C: the contact matrix (computed from the contact matrix given by Thiago, $C_{i,j}$ among the contacts of i the proportion that it is made with people from j):

		0 19	20 49	50 64	65 200
0	19	0.57	0.27	0.10	0.06
20	49	0.20	0.59	0.15	0.06
50	64	0.15	0.46	0.27	0.12
65	200	0.18	0.24	0.18	0.39

- Objective: minimize the number where some kind of social distancing is needed.