**Trajectories Manipulation**

Cleared from bad data cases file, used to calculate Trajectories: *ClearedCasesData.csv*

**Calculation of Trajectories (Reinfections included)**

1. Susceptible / Vaccinated Susceptible

**Folder:** *Trajectories\_Susceptibles – MyMethod*

Step 1

Import the new vaccinations administered per day from *NewPeopleVaccinatedEveryday.csv* file (OurWorldInData).

The Susceptible population on the first day of the pandemic is 920000 (population of Cyprus).

Susceptible(i) = Susceptible(i-1) - NewPeopleVaccinatedPerDay(i)

VaccinatedSusceptible(i)= VaccinatedSusceptible(i-1) + NewPeopleVaccinatedPerDay(i)

**Results:** workspace\_Step1.mat

Step 2

Import results from Step1. Read all the cases data, to -1 from Susceptible or Vaccinated Susceptible from the right state for the specific infection.

Step 3

Because all the vaccinations were removed from Susceptible state and added to Vaccinated Susceptible from Step1, and then at Step 2 we are also removing 1 from the aforementioned states for every infection, the cases that were vaccinated after their infection date, are removed twice from Susceptible state.

So in Step 3 the calculation is:

Susceptible(i) = Susceptible(i) +1

VaccinatedSusceptible(i)= VaccinatedSusceptible(i) -1

**Results:** *workspace\_Results.mat*

1. Infected Detected / Vaccinated Infected / Hospitalized / Vaccinated Hospitalized / Recovered / Extinct

**Folder:** *Active\_States\_6from8states – MyMethod*

For every day of the pandemic, finding the value of each state: if the date of First Sampling/Recovery/Hospitalization is the same with the current iteration date, doing the math.

**Results:** *6\_States\_Trajectories.mat*

**Results All Trajectories:** *Trajectories.xls*

(files *workspace\_Results.mat and 6\_States\_Trajectories.mat* combined)

**Assumptions made for the Trajectories Calculation:**

* Vaccinated – if the case was vaccinated at least 14 days before the infection.
* Non Vaccinated – if the vaccination of the case was less than 14 days from infection.
* Infection day is the First Sampling day.
* The Recovery day of alive hospitalized infection is the Discharged day.
* The death day of hospitalized infection is the Discharged day.
* The first day of vaccinations in Cyprus is 07/01/2021 (because the data we have are starting from this date).

**Calculation of Trajectories without Reinfections**

**Folder:** *Trajectories with Reinfections Removed*

**Script:** *TrajectoriesWithoutReinfections.m*

This code will take as input the Trajectories (*Trajectories.csv*, from previous steps), and the file that includes only the reinfected cases and their full information (*ClearedReinfections\_FullInfo.csv*, created in folder *New Tables*).

What will be done is that, because the reinfections were calculated in trajectories in previous steps, now only for the reinfected cases, from states Susceptible or Vaccinated Susceptible 1 will be added (+1), and from state Recovered 1 will be subtracted (-1).

**Results:** *workspace\_TrajectoriesWithoutReinfections.mat*

**Final Trajectories with Reinfections removed :** *Final\_Trajectories.csv*

**Figures of Trajectories Results**

**Folder:** *Figures\_Trajectories\_Results*