

Using the same procedure as in part 2, we derived a model for the death and case rates of the mock data provided by professors. The data was split into 4 regions displaying different trends. The case rate spikes immediately after the vaccine's introduction, but the death rate isn't significantly changed. In our research, we observed that vaccination reduces death risk to almost 0, so all of these cases can be assumed breakthrough cases. For this entire region, titled "seg2", the breakthroughs were calculated as the difference between each individual timepoint's infection percentage and the average vaccineless infection percentage. After this, we observed the vaccine's effect on death rate. The death rate reduction observed in "seg3" can be related to the vaccinated population in a similar way: if you consider vaccinated individuals as having virtually no risk of death, the difference in death rate is directly related to vaccination rate. The deaths plateau in seg4, and quasi-linearly approach this plateau in seg 3. The vaccinated percentage can then be calculated as a linear function from the final vaccinated number of people in seg2, to 100% at the end of seg3.