**Comparison 1: The Effect of Quarantine**

A screenshot of a cell phone

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Figure a

A screenshot of a cell phone

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Figure b

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Figure c

The three graphs above depicts a simulation of the spreading of COVID-19 in a city of 150 people with a hospital capacity of 50 people. Figure 1a is without quarantine and figure 1b and 1c are cities with a low and high level of quarantine, respectively. As sees in figure 1a, there are about 110 infected people at the peak of the virus; in figure 1b, there is a big decrease in the number of people infected (only 22); finally, in figure 1c, there is merely 3 people infected with the virus. This stark difference shows the effectiveness of quarantining (social distancing) in order to slow the spread of the COVID-19. Hence, our project confirms that social distancing works and that it is an important measure in order to mitigate the spread of the contagious virus.

**Comparison 2: The Effect of Population Size**

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Figure 2a

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Figure 2b

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Figure 2c

The three graphs above depicts a simulation of the spreading of COVID-19 in a city of 250 people with a hospital capacity of 50 people. The three graphs are similar to the graphs in the first comparison; meaning, the first graph has the most infection (no quarantine), followed by the second (low quarantine) and third (high quarantine) graphs. One main difference is the number of infected people at the peak of the virus. With the same hospital capacity of 50 people but with a population that is much bigger (250 people), we can see that the number of infected people at the peak are higher for graphs in figure 2a, b, and c, compared to the graphs in the 1a, b, and c. This shows the importance relationship between population size and the spread of the virus. People living in cities with a higher population is inherently at a higher risk of getting infected with the virus compared to someone living at a city with a lower population.

Comparison 3: The Effect of Hospital Capacity

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Figure 3a

A screenshot of a cell phone

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Figure 3b

A screenshot of a cell phone

Description automatically generated

Figure 3c

The three graphs above depicts a simulation of the spreading of COVID-19 in a city of 250 people with no quarantine in three of them. Figure 3a is a city with a hospital capacity of 40, figure 3b has a hospital capacity of 60, and figure 3c is a city with a hospital capacity of 80. At first sight, the three graphs appear to all be very similar. However, notice that the number of infected people at the peak of the virus in figure 3a is around 210, while that number is 185 and 170 for figures 3b and 3c, respectively. There is a clear relationship between the capacity of a hospital and the number of infected people with the virus—as the capacity of the hospital increases, the number of infected people decreases. This relationship perfectly aligns with our own knowledge of a hospital and its effect on the number of infected people with the virus. Hence, we show that a larger hospital capacity leads to a lower infection rate of COVID-19.