Pandemics: How are Viruses Spread? Activity 3, 9-12

Due to COVID-19, people across the United States are being asked to stay home in order to self-isolate and avoid physical contact with other people using a rule of staying 6 feet apart. If schools and businesses were to remain open then the virus would spread more easily because people would more readily spread the virus through close contact. Set the parameters of the interactive so that the population size represents a small community of 900 people. Then, set the number of days contagious as 14 because that represents the number of days that people can be infected before they have symptoms of the virus.

(1) Approximately what percentage of the population will eventually become infected over time? How do you know?

(2) Describe how you can change the parameters so that approximately 50% of the population is eventually infected?

(1) How can social distancing help to flatten the curve so that the number of people of infected people is less than 20%? What other factors could influence the chance of contracting the virus? Justify your reasoning using the simulation.

Solution Guide

(2) Approximately what percentage of the population will eventually become infected over time? How do you know?

Note: The results vary based on the number of days present in the results section of the simulation.

On Day 23, the graph peaks with the number of people infected at once, but running the simulation for 60 days shows 99% of the population will become infected.

(3) Describe how you can change the parameters so that approximately 50% of the population is eventually infected?

One possible solution is to decrease the chance of contracting the virus per contagious contact to 5% and the number of contacts per day to 2. This could yield a result of 47.1% uninfected.

(4) How can social distancing help to flatten the curve so that the number of people of infected people is less than 20%? What other factors could influence the chance of contracting the virus? Justify your reasoning using the simulation.

Students might immediately put the number of contacts per day to 1 which flattens the curve entirely. By thinking about real-world examples that decrease the chance of contracting the virus per contagious contact, students might consider discussing medicine that could reduce the days contagious, limiting the number of people in grocery stores, etc.