

Understanding Herd (Community) Immunity – Simulation Worksheet

Pre-Lab

Describe what you’re supposed to be learning from this activity.

Procedure

1. You will see a field of asterisks, representing vaccinated (green) and unvaccinated (red) people.
2. Below the field of cells you will see a box containing the variables you can set for the simulation. You will only change the immunization rate (from the default value).

Immunization rate on left: Immunization rate on right: Same as left
 Infection rate if not vaccinated: Infection rate if vaccinated:
 Infection speed:

3. Check the “Same as left” box to keep the immunization rate on the left side the same as the right. Keep the infection rates and infection speed set to the default values.
4. The default is 0.9 on both the right and left sides. Set the immunization rate to the value provided by your teacher. (The value will be from 0.1 to 0.9). Record this immunization rate in the first column of your data sheet.
5. Click on an unvaccinated cell (red asterisk) to infect it.
6. From the Results section in the simulation, record the percent figures resulting from you infecting a cell.

Results:

Total population: = vaccinated + unvaccinated.
 Number infected: = vaccinated + unvaccinated.

% of population infected.

% of vaccinated population infected.
 % of unvaccinated population infected.

% of infected that had been vaccinated.

7. Click the Repopulate button, and repeat the procedure from Step 7 4 more times. You will have 5 trials, using the same immunization rate.

8. Once you have collected the data for your simulations, calculate the average for your data.
9. Your teacher will facilitate the sharing of class data, called “pooling” data.
10. Use the summary data table and the graph to answer the simulation evaluation worksheet.

Herd Immunity Simulator Data Sheet

Enter the data from your herd immunity simulations into the spreadsheet, and calculate the statistics.

Immunization rate _____

Trial	% population infected	% vaccinated population infected	% unvaccinated population infected	% infected had been vaccinated
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Mean				

Class Data Analysis

Enter the mean percentages for each of the immunization rates in the class data.

Immunization rate	% population infected	% vaccinated population infected	% unvaccinated population infected	% infected had been vaccinated
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				

Simulation Activity Worksheet

1. Describe the relationship between immunization rate and percent of population infected.
2. How does the percent of the *unvaccinated* population who are infected change as the immunization rate increases?
3. Is there a point in the class data where the unvaccinated population seems to be protected from infection? Explain your answer.