Random Process Simulation Activity

1. Go to the following article: <http://www.theguardian.com/society/ng-interactive/2015/feb/05/-sp-watch-how-measles-outbreak-spreads-when-kids-get-vaccinated>. Run the simulation 10 times and record your results in the table below. For each trial, place a mark in the box if a measles outbreak occurs. Then record the total number of outbreaks that occurred and calculate the % of the time that outbreaks occurred for each level of vaccination.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial # / % vaccinated | 10% | 30% | 50% | 58.5% | 68.9% | 74.4% | 83.8% | 86% | 90% | 99.7% |
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |  |  |
| **%**  **outbreaks** |  |  |  |  |  |  |  |  |  |  |

1. This simulation is an example of a random process. Were your results the same for each trial? Why or why not, based on how the simulation works?
2. Within a single trial, did populations with higher vaccination rates always avoid outbreaks compared to populations with lower vaccination rates? If not, which specific trials and populations broke this pattern?
3. Looking at all the trials together, did populations with higher vaccination rates always avoid outbreaks compared to populations with lower vaccination rates? If not, which populations broke this pattern?
4. How representative is a single trial of the total results?
5. Define a “random process” in your own words.