CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

S1509

Project Title

Using Computer Simulation to Determine the Effect of Fatality Rate on the Spread of Disease

Abstract

Objectives/Goals

The purpose of this project is to create an accurate and useful computer model that portrays the effects of the spread of infectious disease and how different mortality rates allow the disease to affect populations.

Methods/Materials

A code was created on Netlogo, an agent-based modeling environment, using statistics and reason. The simulation was run using disease variables of SARS (Severe Acute Respiratory Syndrome) and varying mortality rates. Each of the different fatality rates was run in three trials of 1825 ticks.

Results

The results showed that lower mortality rates caused the SARS virus to infect more people; when the fatality rate was 0%, a median of 7295 million people got infected over 5 years, while when the death rate was 100%, the median was the lowest at 2360 million total infected people. The findings provide that more deaths occurred when the mortality rates were lower; at 100% death rate, there 2680 million deaths, and when the death rate was 5%, 3733.33 million people died.

Conclusions/Discussion

Because lower death rates allowed the virus to affect more people and survive for a greater duration, viruses can be expected to have evolutionary trends leading to lower mortality rates. While these lower mortality rates may benefit the individual, the results show that lower fatality rates are more harmful to the human race than higher death rates

Summary Statement

This project is based on using Netlogo to create a simulation of the spread of disease that portrays the effect of varying mortality rates on populations and can be used to predict possible viral evolutionary trends.

Help Received

Mrs. Groch helped us to focus our project; Used laptops and computers belonging to our parents; Parents helped create poster