

How Fast Can Chickenpox Spread From Person To Person

New Mexico

Supercomputing Challenge

Final Report

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Executive Summary

This project is designed to model how fast the chickenpox can spread from person to person. If people knew the details about how fast chicken could spread from person to person, maybe they could reduce the number of people that get chickenpox. The goal of this project is to show how fast the chickenpox could spread from person to person. The chickenpox is contagious five days before the rash and five days after the rash. It takes two or three weeks of exposure for a person to get the chickenpox from another person. The chickenpox is most contagious. The chickenpox spread on the face, scalp, and trunk. For our model, we used a program called StarLogo. Our model is modified to fit the data that we have collected. The model we created will show a related number on how fast chickenpox can spread from person to person.

Problem Statement

The chickenpox is a disease characterized by a fever, a cough, a sore throat, a decreased appetite and then a rash. The chickenpox is spread to people who haven't had the disease. The chickenpox spreads in the air when an infected person sneezes or coughs. If we tried to predict the rate of how fast the chickenpox spread, medical authorities will be able to make sure that not as many people can get the chickenpox. To model this, we will use a program called StarLogo. There will be agents that go around in a random pattern colliding with others. When they collide, they will turn a certain color. And then turn back to the color that represents the healthy ones. The question our team wanted to find the answer to was "How fast would the chickenpox spread if it became an epidemic?" This interested us because of how easily the chickenpox can spread.

Method Used To Solve Problem

The way we solved the problem was that we collected information from various websites. We then used the information we got to find the answer to the problem. We also made a model on Starlogo that demonstrated the information we collected.

How Model Was Verified and Validated

We verified our model by checking the recovery rate online and finding out that it was 99.9%. We also checked the infection rate and it was 20%. We set both the infection and recovery rate to their numbers and that made it realistic.

Results of Research

The results of our research were that chickenpox would spread from person to person at a rate of 60.9%. The chickenpox is an infectious disease. Chickenpox is a common illness that causes an itchy rash and red spots or blisters (pox). It spreads from person to person. . It can become airborne if you are by people coughing or sneezing. Mothers with chickenpox can pass it on to their newborn babies. Chickenpox has been a human affliction for 1000s of years. Until the 1900s chickenpox were thought of as smallpox. Since 2005, vaccine has also been available as part of a combination vaccine called MMRV. Chickenpox vaccine is a shot that protects people from getting chickenpox .The chickenpox vaccine is recommended for all children under the age of 13.

References and Graphs

<http://www.webmd.com/vaccines/tc/chickenpox-varicella-topic-overview>

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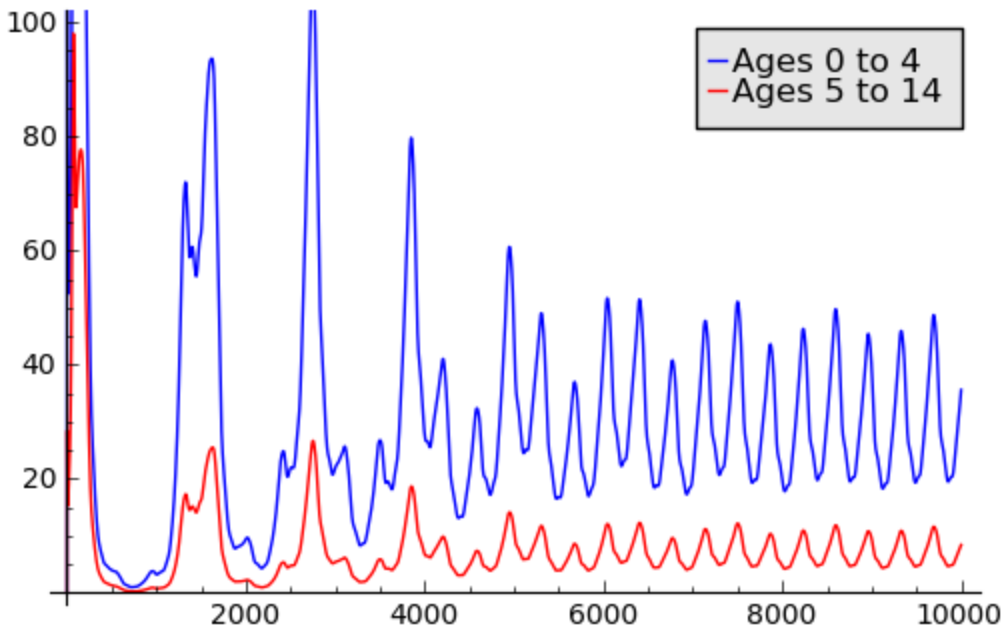
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This graph describes that ages 0 through 4 gets more chickenpox than ages 5 through 14. It says that younger kids have a greater chance of getting the chickenpox than some older kids getting chickenpox.

Conclusion

Our team learned information on the chickenpox. We learned that the older you are the more severe the disease becomes. After a person has been diagnosed with this virus, they usually don't get it more than once in their life.

We learned how to model this virus with StarLogo TNG. StarLogo allows us to model how this virus spreads from person to person. We are excited to share our experiences about this research.