How can West Nile spread? New Mexico Supercomputing Challenge Final report March 11/2014 Team#117 Picacho Middle School

Team Members:

Jose Olivas,

Dominic Matheson,

Yeriel Tavera,

Teachers Sponsors:

Mrs. Stout,

Mrs. Kindig

Project Mentor: Carl Bogardus

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Executive Summary

We research the West Nile virus because we were interested in learn how it spread. We divided into teams and each one of us took part in different sections. We selected different variables to represent the infected bird, the mosquitoes, and the infected agent or person when infected. We program our model using StarLogo TNG. The model creates agents that when become in contact become infected.

People do not become infected the mosquito becomes infected and infects the other agent.

How can West Nile Spread?

Statement of the Problem

West Nile virus is most of the time spread by the bite of an infected mosquito. Mosquitoes are infected by biting a bird that carries the virus. West Nile virus is not spread from person to person or directly from birds to humans. Some cases have resulted from blood transfusion and organ transplants. We are trying to solve the problem in StarLogo TNG.

Method used to solve problem

We used resources from the Center for Decease Control to find information of West Nile we made our model from there. We try to solve the problem and we noticed that it comes from birds and infect the mosquito when the mosquitos bite the infected bird.



Graph is from http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5902a1.htm

The discussion of how we verified and validated our model

Our model simulates the process of how West Nile spreads. West Nile spreads by the bird that is infected and gets bit by a mosquito. The blood from the infected

bird gets into the mosquito and the mosquito bites the person. The blood from the infected bird gets inside the person. Then the person gets infected with West Nile Virus. The Result of our Research West Nile virus has quickly set up itself in North America since its recognition in New York City in 1999.

Historically, West Nile Virus has been associated with temporally dispersed outbreaks of mild febrile illness.

In recent years, the epidemiology and clinical features of the virus appear to have changed. Today we have more frequent outbreaks associated with more severe illness being noted.

The conclusions we reached by analyzing our results

We looked at our model and discover how the West Nile virus cycle works and how the virus spreads. West Nile spreads by the bird that is infected.

We learned how to model the spread of the West Nile. We also learned how to use StarLogo TNG and do a research. We will continue working to learn more about West Nile and modeling. It was a good experience for us to do this report. The software, references, tables, and other products of our work.

The software that we used is StarLogo TNG to build our model. The graph is to see how many incidents there were in each year. We basically used CDC to find our research for the model so that we can make the model do of how West Nile is spread..

Sorry we had to put this graph but it was the best one that we got from our model. The Most significant Achievement on Our Project.

The most significant achievement on our project is to know how the virus spreads. Also how to use StarLogo TNG to simulate the process of the birds having the virus and mosquitos bite, the bird and they get the virus. Also how the mosquitos infect humans the blood form the bird goes in to them and infect.

Not all the mosquitoes infect humans and not all the people who get the infection died.

Acknowledgments

I'd like to acknowledge our teachers Mrs. Kindig, Mrs. Stout, and Mrs. Wise for helping us every Tuesday end try to get as much done as they can.

References

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- * whyfiles.org/2012/west-nile
- * James J. Sejvar, MD www.ncbi.nlm.nih.gov

What are the symptoms of West Nile?

West Nile virus is a mosquito-borne illness. Up to 80 percent of people infected with West Nile virus will have no symptoms. People recover on their own.

About 1 in every 5 people who are infected will develop a fever with other symptoms such as headache, joint panes, vomiting, diarrhea, or rash. Some cases can Couse severe illness or death.

How can you prevent West Nile?

One way that you can prevent West Nile is by applying insect repellent. Eliminate standing water in out side of your house. Wear long-sleeved shirts and long pants when you go outside during the rainy season. Use air conditioning or make sure there are screens on all doors and windows to keep mosquitoes from entering home.