

Are Babies Safe From West Nile Virus

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Executive Summary

For our project, we decided to model the death rate of babies with infected mothers of West Nile Virus. Our research showed that there are two known cases of the placental barrier being broken and a child being infected with West Nile Virus in the United States, and that West Nile Virus came from Uganda to the U.S., which proved to be useful information in the research process. What we are doing to test this on Starlogo TNG is we are programming in the immune system of the mothers, and the West Nile Virus. We did not put in a different strength of West Nile Virus, just a stronger or weaker immune system. We researched the immune system, and how West Nile Virus attacks the nervous system in order to get a base-line for our models. We predicted that the stronger immune systems would be able to keep the baby surviving. The baby with the mother with the weaker immune system might actually die because of this. Our constants were the time of year (rate of catching the virus,) and how fast the virus multiplied, and how much of the virus was in the model. Our only variable, as I stated before, the strength of the immune system. We expected that offspring of mothers with weaker immune systems would have more chance of being infected, and more of a chance of having slight to severe health issues later in life, because of their encounter with the virus before even being born.

West Nile Virus

West Nile Virus, as many of us know, is a serious problem these days. Since 1999, over 30,000 people have reported cases of West Nile Virus, 5,387 of them being deadly. West Nile Virus was first discovered in Uganda in 1937, and in New York it was confirmed that there was a case in 1999. The virus works by attacking the nervous system, causing problems in serious cases, such as paralyzation, muscle weakness, and neurological damage. 1 in 150 people with West Nile Virus will develop a more serious disease and have these issues, that is less than the 20% that develop the West Nile Fever. The best way to protect against West Nile Virus is prevention. The CDC says this: “When you are outdoors, use insect repellent containing an

EPA-registered active ingredient. Follow the directions on the package. Many mosquitoes are most active at dusk and dawn. Be sure to use insect repellent and wear long sleeves and pants at these times or consider staying indoors during these hours. Make sure you have good screens on your windows and doors to keep mosquitoes out. Get rid of mosquito breeding sites by emptying standing water from flower pots, buckets and barrels. Change the water in pet dishes and replace the water in bird baths weekly. Drill holes in tire swings so water drains out. Keep children's wading pools empty and on their sides when they aren't being used.”

Placental Barrier

The placental barrier is one of the marvels of the human body that make reproduction possible. What the placental barrier does is it filters out chemicals and other harmful things that could hurt a baby if it touched them. However, not everything gets blocked out. This barrier is considered one of the “leakiest” barriers since it has to let some things, like some nutrients, to cross. It is not the only thing of the immune system keeping the baby safe, thank goodness.

Conclusion

The results for the project are depending on the strength of the immune system, the higher chance of a person facing less symptoms or none at all. A person having a lower immune system are more viable to the disease. When a person uses the average precautions, such as long sleeved shirts and bug spray, their chances of catching the disease are shortened, and when they catch it the symptoms are a lot worse. The West Nile repopulates over time, but as people gain an immunity to the diseases, or are strong enough to fight the disease, it eventually disappears.

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