

# **RABIES:**

## **Can we save**

## **ourselves?**

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**Team Number:** 162

**School Name:** Taos Charter School

**Area of Science:** Epidemiology

**Project Title:** Rabies: Can we Save Ourselves?

**Sponsoring Teacher:** Tracy Galligan

**Problem Statement:** Rabies is a disease that is noted as one of the most deadly diseases. Many rabies cases are treated quickly, which means it does not cause enough deaths to make the top ten deadliest diseases. Rabies is one of the top 100. We will work to see if rabies could become an epidemic. With the data we will develop a plan so that if it were to become an epidemic, we

could halt its growth. The incubation period is normally from thirty to sixty days. However, symptoms of rabies could show from as little as ten days up to multiple years later in humans. The importance of getting this information could be pointless if a super medical center develops a new medicine.

But if an epidemic like this were to break out, we could help cure the disease. When a human is bitten by a rabid animal they will often get hydrophobia-or fear of water, and they get dehydrated and the virus starts to affect your brain when it is weak from dehydration, the human will go into a coma for about 10 days to 2 weeks, and after that you die.

**Problem Solution:** Through our modeling we will see how fast and how bad the spread of rabies can be through the continents. Our model is going to have rabid animals and humans who are going to interact, and over time rabies is going to take over the world and infect everyone.

**Progress to date:** We have completed our experimentation and shown that humans can survive the rabies outbreak, to some extent.

**Rabies in New Mexico:** The incidence of rabies in New Mexico is low. There are between 1 and 49 cases of death every year. This is low compared to some states in the U.S. like Texas, California, and many states on the east coast. The most common animal to carry rabies in New Mexico is the skunk. Rabid skunks are common throughout the mid and southwestern states.

**Rabies In the U.S.A:** Rabies in the U.S. mostly happens in the Appalachians and east coast.

**Reasons for Programming Rabies:** Rabies is an intense disease that left untreated could be lethal. The symptoms range from extreme hyperactivity to calm and confused. Modeling a something like Rabies outbreak which can kill in 4 to 14 days could be a life saver. Rabies could strike a part of the world somewhat like the plague.

**Data Recorded:** Rabid Epidemics can change data and research over the years. Rabies can have a break through, or it can keep quiet for years.

This Graph shows the number of cases in Rabies over the years.

In 1950, there were eight hundred domestic dogs seven seventy five dogs and the wildlife was extremely low in modern times all the rabies attacks are flat lining at almost zero. Not only does the second graph reach back farther than the first, but it shows different cases throughout various animals. The first graph with the help of the second graph probably is recording raccoons.

**Modern Shots For rabies:** With modern shots it is easier to cure rabies. All they do is give victims a shot in the arm. Shots have increased the chance of survival and now there are less people dying every year.

**The Old Rabies Shot:** The old shot was a series of painful set of shots in the stomach. There was a lower chance of survival.

**Summary:** The idea is to program a reasonable amount of agents.

A warden who kills rabid animals, rabid animals that when collide with humans it kills the agent, other dogs that when attacked turn rabid, and doctors shall be added soon. Graphs holding data will be shown to prove the certain events.

**Data:** No data confirmed about New Mexico. Notice the Appalachian region has a large consumer of cases.

### **Coding:**

Coding can be a useful thing in this day in age. Coding can be used for predicting the future to see epidemics, climate change, and natural disasters. Although sloppy animation, coding can represent the future.

**Prevention:** Good and simple tips can be used to prevent Rabies. Ideas for prevention include having awareness of animals around you, getting shots for you and your animals, and having medical insurance just in case.

**How We Did Our Model:** We took an area the size of Los Alamos, New Mexico and put 2 rabid dogs, 200 regular dogs, 700 humans, and 1 warden, later accompanied by a second warden.

**Most Significant Achievement:** This was our first year in supercomputing and I think that our biggest achievement is probably getting our code to a semi functional point where the humans don't just die. When we started, our model would quickly kill all the humans, and leave only

rabid dogs. There are still some things that we need, but I think we have done pretty well on our code.

**Personal Achievements:** Our supercomputing group had lot of personal achievements. Rowan Kinney mostly taught himself to code and program. Nialo Kinney and Lachlan Henderson learned a share of coding and programming. In all, we learned more about computers and software.

**Illustrations:** This is the Rabies virus.

A rabid dog.

A human hand infected by rabies. A Chart of the United States. As you can see areas with vegetation have higher Rabies issues. This is a map of rabies in the whole world. Red is high danger, orange is medium, yellow is low danger, and green is no chance.

**Methods:** We used Starlogo® and made a model to program a sequence with rabid dogs attacking humans and other dogs with a warden fighting the rabid dogs. It's really like a real life sequence.

**Software References:** Starlogo®, Google Chrome®, [www.wikipedia.com](http://www.wikipedia.com), [www.mayoclinic.net](http://www.mayoclinic.net), [www.newmexicohealth.com](http://www.newmexicohealth.com), and [www.googleaccounts.com](http://www.googleaccounts.com).

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