

Team Number: GADMS114

School Name: Gadsden Middle School

Area Science: epidemiology

Project Title: Rabies in Mammals

### **Problem definition**

Rabies is an avoidable viral disease of mammals that is most often transmitted through the bite of a rabid animal. Rabies show every year in wild animals such as foxes, bats, dogs, and wolves. Any animal will always die as rabies slowly kills their brain. Symptoms of rabies can be similar to influenza, and symptoms that could occur during rabies are Fever, Headaches, and Nausea, Throwing up, agitation, Anxiety, Confusion, and Hyperactivity. The survival rate is low, only two people have been reported to have survived, in 2008-2011. Twenty one people have died from rabies, in 2008-2017.

Information found in <https://www.mayoclinic.org/diseases-conditions/rabies/symptoms-causes/syc-20351821> and <https://www.cdc.gov/rabies/index.html>

### **Problem from Domestic Animals in Exposure Compared to Humans**

For health districts that recorded exposures by species among those receiving PEP, almost 38% of individuals received PEP due to exposure to a wildlife species, approximately 36% received PEP due to exposure to a dog, and approximately 24% received PEP due to exposure to a cat. Less than 3% of people received PEP due to livestock exposure.

[http://www.vdh.virginia.gov/content“Rabies.” Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 24 Sept. 2014, www.cdc.gov/rabies/medical\\_care/vaccine.html./uploads/sites/13/2017/02/Rabies2015.pdf](http://www.vdh.virginia.gov/content“Rabies.”%20Centers%20for%20Disease%20Control%20and%20Prevention,%20Centers%20for%20Disease%20Control%20and%20Prevention,%2024%20Sept.%202014,%20www.cdc.gov/rabies/medical_care/vaccine.html./uploads/sites/13/2017/02/Rabies2015.pdf)

## **Problem Solution**

The problem we have is, if an outbreak of rabies would happen in a habitat some of the species in the habitat would become extinct to that forest as there would be animals that would become infected and kill the animals around them such as with wolfs they would go on a “killing spree” killing everything in their sight such as herbivores and if the wolf doesn’t kill the animal but only injure it would also become infected making it go into a “killing spree” killing even more animals eventually if left untreated making whole species go extinct so what we are doing is setting up humans so that they chase the wolf and if they touch them they would have a chance to get infected but the wolf will die.

The transmission rate will be used by population based on research for domestic animals from the state of Virginia.

<http://www.vdh.virginia.gov/content/uploads/sites/13/2017/02/Rabies2015.pdf>

## **Progress to Date:**

Program was made in star nova to model transmission rates. Agents for healthy population is a population slider, which will be based on populations by 100 thousands. The amount being infected is also a slider that will track the number of domestic animals diagnosed in an area of population to show the results of infection rate that can produce an outbreak based on data from Virginia that show human exposure based domestic animal exposure. Those infected will be colored red in our model. The model will be allowed to run for 200 ticks before being stopped, each amount infected will be run 20 times for each populations and will be put into an excel graph to conclude for our expected result.

## **Expected Result**

What we expect to happen after the programing is done would be almost what everyone would expect. Only a few wolfs (agents) would not be infected with rabies. Most wolfs would be infected also dead which would result in an

Outbreak. Then the not infected wolves would attack the infected which are in their territory. As the time passes while the programing is on the infected, it will eventually die.

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## Bibliography

"Rabies." *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 24 Sept. 2014, [www.cdc.gov/rabies/medical\\_care/vaccine.html](http://www.cdc.gov/rabies/medical_care/vaccine.html).

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