How Small Towns are Affected by Dengue Fever?

Team Number: JMS 60
School: Jackson Middle School
Project Area: Health
Computer Language: NetLogo
Members Grade Level: 8th

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Definition of the Problem

Our project is mostly about the effect of Dengue fever on small towns. We researched the effect Dengue Fever had on people. We also searched the places where Dengue Fever occurred the most in the tropics and humid places. We have read multiple articles on how Dengue Fever is spread through mosquitoes and talked to someone who told us more about Dengue Fever. We have also studied waters impact on Dengue. Water, especially the amount leftover from the hurricanes, has a huge affect on Dengue Fever. All this research made us more prepared.

Problem Statement

The problem that we were trying to figure is how Dengue Fever affects people. Dengue Fever can cause a lot of symptoms, including nausea, headaches, weak bones, etc. We also wanted to find out if this killed people, which in later research; we found out you can die from Dengue Fever. Fifty percent of humans on earth are at risk for Dengue Fever, that's three hundred ninety million infections per year. Before the 1970's only nine countries experienced Dengue Fever epidemics, now over hundred countries are at risk. About twenty five thousand people die a year. There are vaccines and treatments such as papaya and a medication called Analgesic.

Method

We researched about a lot of information including aedes aegypti mosquitoes life styles and how they sting, and why they bite. We also, researched Dengue Fever, the flavivirus (RNA) disease and places you can find dengue fever in the United States. Dengue Fever is the world's fastest mosquito spreading disease. When we researched we had a lot of information from the internet. We used different online and article based sources in our research to find the many aspects behind our problem.

When we met with Steven B. Bradfute from UNM at Jackson Middle School, where we meet every Monday, we discussed with him our current project ideas. We met with Mr. Bradfute early on in the process of our project, around when we started the interim report . We showed him our proposal, code, and discussed our future visions. We asked some questions and discovered that the aedes aegypti mosquitoes are the mosquitoes that carry Dengue Fever as well as Zica.

Code

Our model was coded on NetLogo. Our model is experimental.We simulated a mosquitos reproducing. We have yet to finish our code because of the skill level with making our idea come true. There has been lots of trial and error. When you press set up there are green people and red people, brown and gray bugs and six blue patches. The green people are healthy and red people are infected by dengue fever. The brown and

gray bugs are aedes aegypti mosquitoes, the brown mosquitoes are female and the gray are male mosquitoes. The six blue patches are the small pools of water that the mosquitoes like to reproduce in. In go we still need to further expand our code. We also were thinking of adding a plot that would show the number of people are being infected by the closeness of the pools of water.

```
breed[bugs bug]
breed[persons person]

 to setup
  clear-all

 create-persons 15
  [
    forward 15
    set shape"person"
    set color green
    set size 2
    setxy random-xcor random-ycor
  ]

  create-ordered-persons 5
  [
    forward 15
    set shape "person"
    set color red
    set size 2
  ]

  create-ordered-bugs 7

  [
    forward 5
    set shape "bug"
    set color brown
    set size 1
  ]

  create-ordered-bugs 7
  [
    forward 8
    set shape "bug"
    set color gray
    set size 1
  ]
```

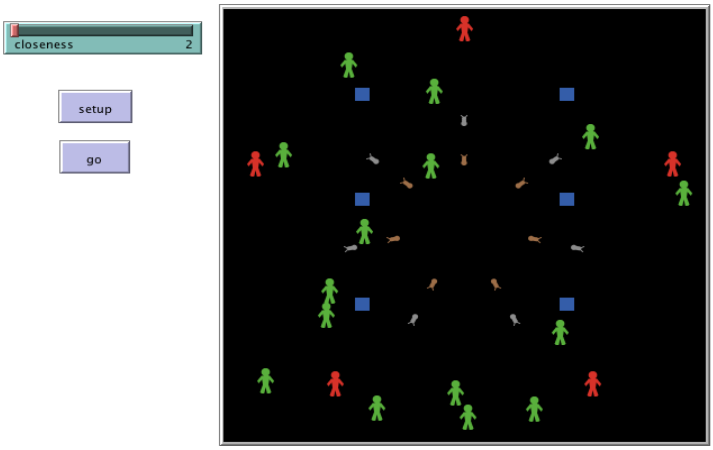
```
  ask patch 7 10 [
    set pcolor blue]
  ask patch 7 2 [
    set pcolor blue]
  ask patch 7 -6 [
    set pcolor blue]
  ask patch -7 10 [
   set pcolor blue]
  ask patch -7 2 [
    set pcolor blue]
  ask patch -7 -6 [
    set pcolor blue]

end

 to go


  ; brown [female] bugs go around and get blood
  ;than mate the gray [male] bugs
  ;the  gray [male] and brown [female] bugs die
 ;than try try again

end
```



Results

In regularity to solve our problem we needed to research on a lot of demeanor. Female Aedes aegypti mosquitoes are the sex that sting and also lay eggs (because they are apart of the holometabolous insect family). The process of the spreading of the disease is the mosquitoes get the disease from a person with the Dengue Fever and then the mosquitoes sting a person who doesn't have Dengue Fever. From then on we searched "Dengue Fever" and found many different articles and studied them. We also we talked to Steven B. Bradfute from UNM about the process in which the bugs sting.

Conclusion

We have not succeeded to finish our project. We never found out all the science behind Dengue Fever, which was one of our goals. We haven't yet figured out the effects on towns either. We have succeeded in the way of finding out what the aedes aegypti mosquitoes do and why they sting. We have also found out how they came to America through tiers. Dengue fevers symptoms and remedies and where dengue is most common. We have not decided yet but this could be a two year(s) project.

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Most significant achievement:

My greatest achievement throughout this experience is the amazing very interesting information on the aedes aegypti mosquitoes that we gathered. The Aedes aegypti are very interesting because they came over the North America in Tires which is just an amazing thing. It also not that common to die from dengue fever but it adds up in the end. I think it is a good thing we picked a topic we never knew about so would could explore and widen are knowledge. -Kyreen White

My most significant achievement is on all the knowledge we have gathered about Dengue Fever. I'm most proud of this because not all of people understand its importance, or existence. I am proud of this project and all the knowledge because I have it, and now can inform more people about Dengue Fever. - Gwenevere Caouette

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Mrs. Meyer- Thank you for coming every Monday, and giving us tips about or project.