

Info 3300 Project 2:

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1. The Data

This project was made with the intent to explore the network effects of disease spreading throughout the United States. To create our visualization, we implemented several different data sets, including Topo.Json for the creation of the map, flight data from this website (<http://stat-computing.org/dataexpo/2009/the-data.html>), airport data from the same website (<http://stat-computing.org/dataexpo/2009/supplemental-data.html>), state population data (link unavailable, dataset stored in our files), and the disease Ro numbers from Wikipedia (http://en.wikipedia.org/wiki/Basic_reproduction_number).

Since the data sets we used were rather large in entry size, we decided to drastically cut down the files themselves. Originally, our flight data was for an entire year, and we deleted entries so that it only contained 28 days, along with only the variables we decided we needed (source, destination, airport, day flown, etc). We wanted enough data to successfully show the propagation of disease, but felt that an entire year was extraneous and also very difficult for loading time on our simulation, so for these reasons we reduced our set.

We used Topo.Json for mapping the USA, but we used states, airports, and flights information to create objects that successfully track changes in population movement.

2. Mapping to Visual Elements

We felt that a visual simulation was the most intuitive way to display the spread of disease, and for this reason we decided to bring our flight data to life. By extensively studying this guy's code (<http://www.tnoda.com/blog/2014-04-02>), and adapting it to a different type of d3 mapping, we eventually were able show the flights. This required a lot of struggling with projections and paths, but ultimately was very valuable for us to learn.

To display the disease spread, we created a color scale that went from the normal color to a bright red when the population reaches 100% infected. Since the user can click on the state to see this information, and since the red is a very apparent color, we hope that the notion of "infected state" is a very intuitive association to the color.

We also have an option to select a state, and it lights up orange while selected. This color was intended to draw attention to the state that was clicked, to be clear about what was being described.

3. The Story

The purpose of this simulation is so that users can find which airports are the most devious in terms of spreading disease. This can be calculated and observed by running multiple simulations and keeping track of the spread ratio (begotten by airport.spreadRatio) over the simulations while using individually randomized locations for each initial infected person. However, since we wanted this simulation to mainly show how a disease would spread after originating from one area, we localized all the initial infections to be in one random state.