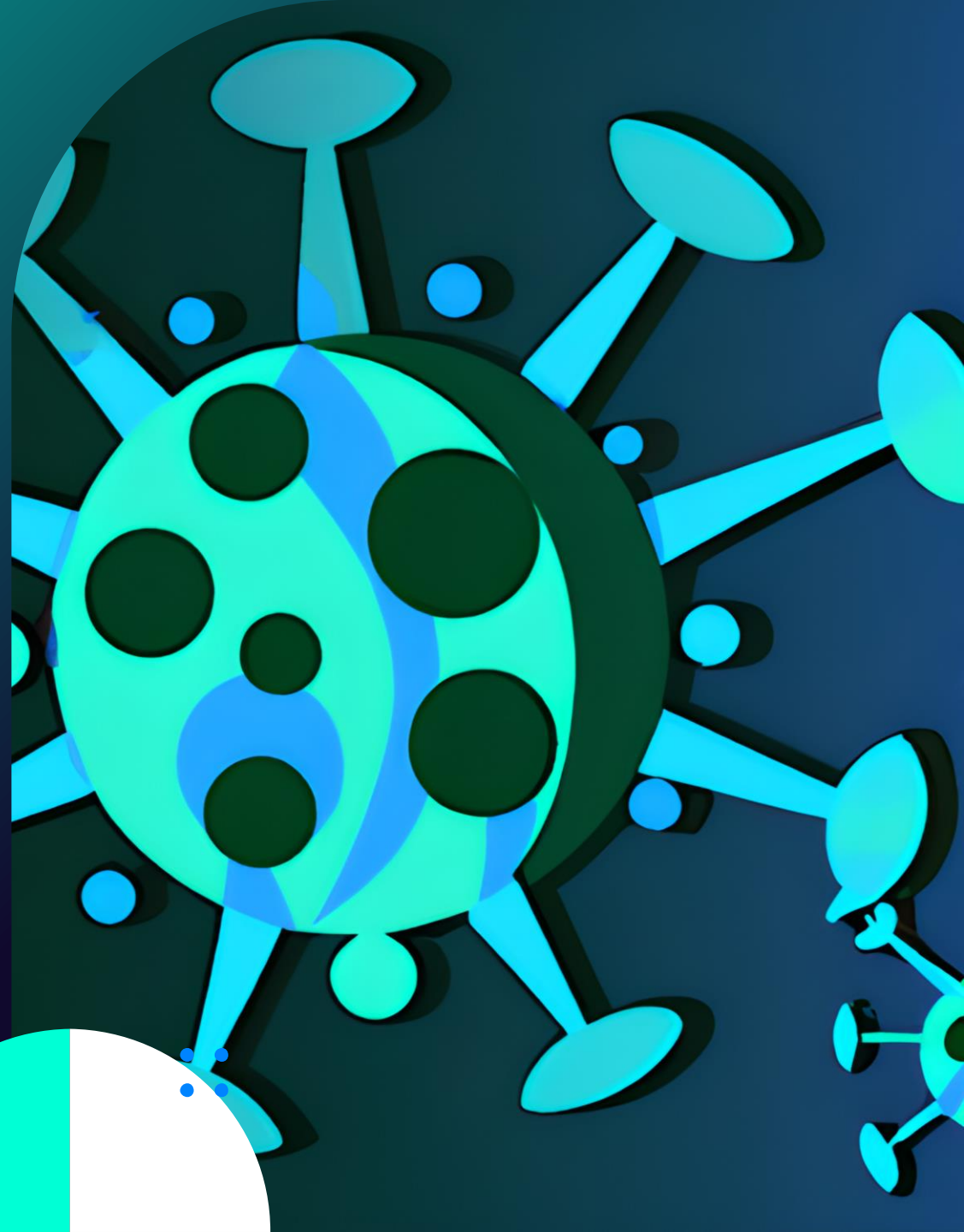
Project 2:

Preparing for flu season in the US



PROJECT 2: PREPARING FOR FLU SEASON IN THE U.S.

Overview: The goal of this project was to help a medical staffing agency (The Temp Staff of Hermes*) plan for the coming influenza season (2018) by 1) Determining whether influenza occurs seasonally, or throughout the year; 2) Finding which populations are vulnerable and in which states they are most affected and; 3) Prioritizing states as low, medium, or high-need based on vulnerable populations.

Data

- CDC influenza deaths†
- US Census population estimates.
- NOAA average temperatures
- Data ranged from 2009-2017.

Skills

- Translating business requirements
- Data cleaning, profiling, integrity, and quality.
- VLOOKUP
- Visual design with Tableau
- Forecasting

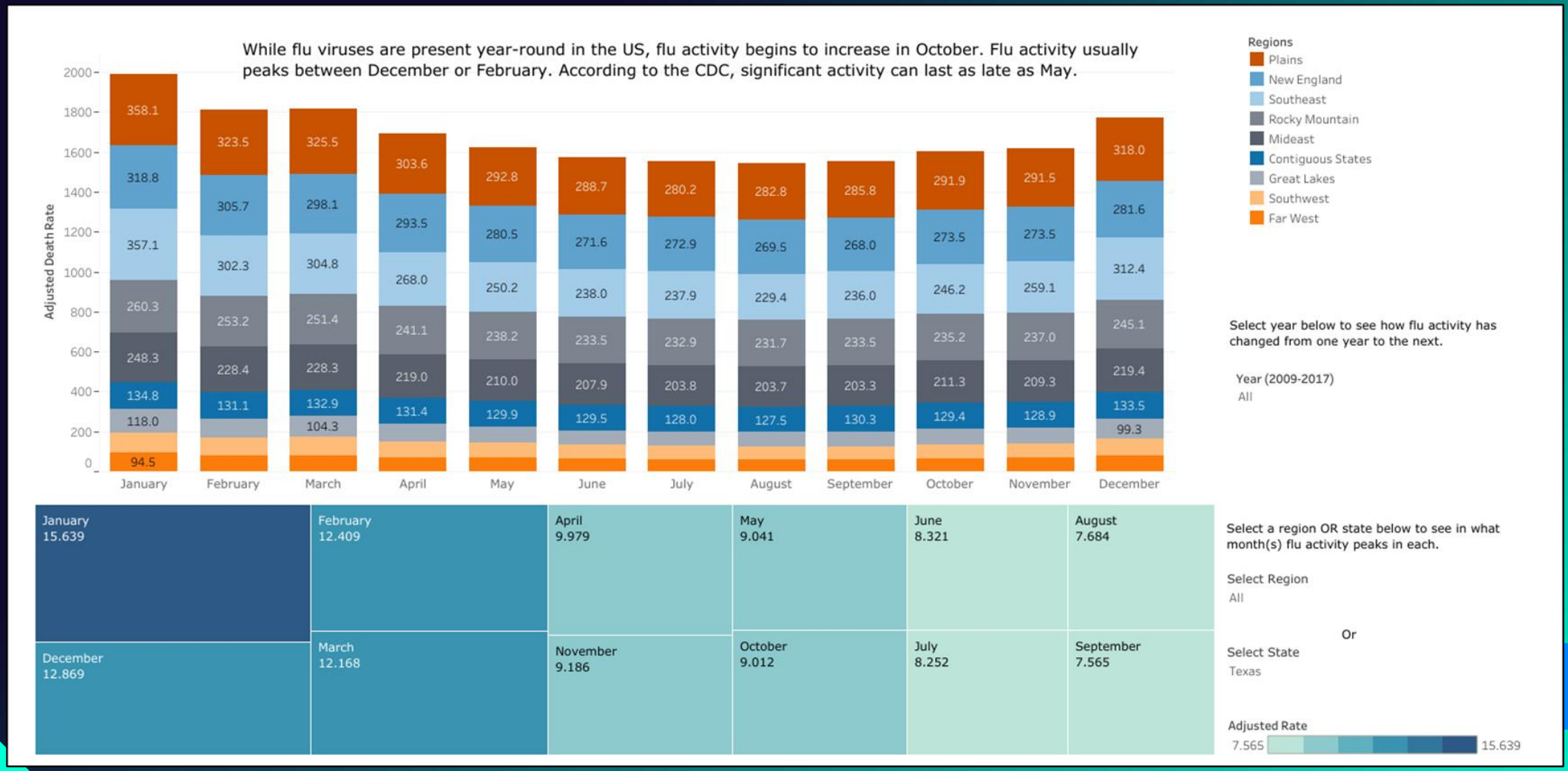
Tools

- Microsoft Excel
- Tableau

* Fictional company
† Death counts adjusted per 100,000 people (adjusted rate).

PROJECT 2: Analysis – When is flu season?

U.S states were grouped into regions to make visuals easier to read. CDC influenza and influenza-like death rates (adjusted) by month and region were used to determine when flu season occurred in each region based on increasing rates.



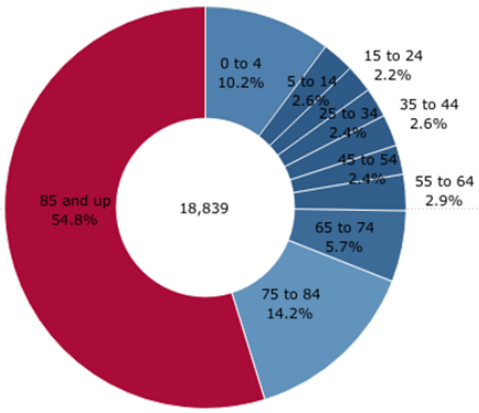
PROJECT 2: Analysis – Vulnerable Age Groups

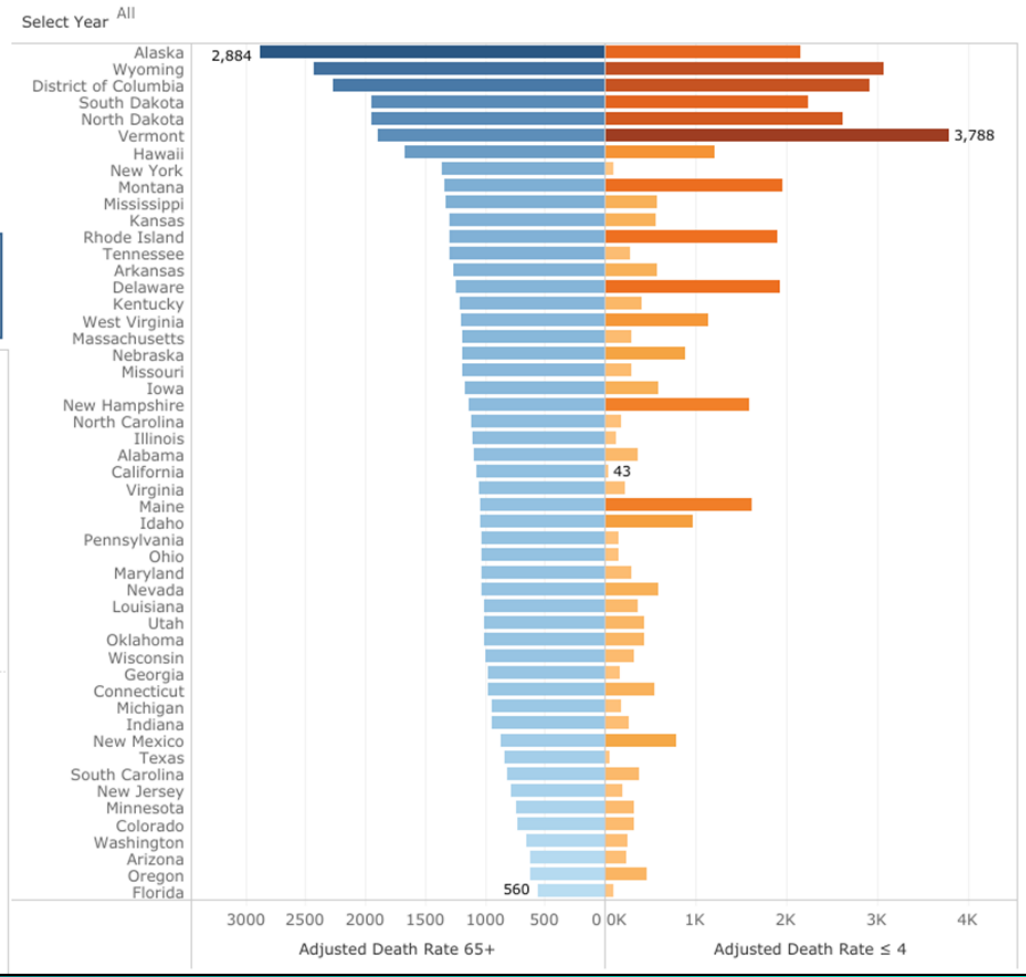
Adjusted death rates were analyzed by 10-year age groups (except for children under 4) by total deaths nation wide. The most vulnerable groups were those over 65, and children under 4. The adjusted death rates of these two groups was then organized by state.

Vulnerable Age Groups

Between the ages of 0 to 4, influenza death rates are fairly significant. Between the ages 5 and 64, the influenza death rates remain low (< 3%). Rates begin to increase around the age 65 and continue to increase with age. This matches CDC assumptions that adults 65 and older are at higher risk of developing serious complications from the flu. Young children are also at higher risk than young health adults (but less than adults 65+). This data does not include pregnant people or people with chronic health conditions.

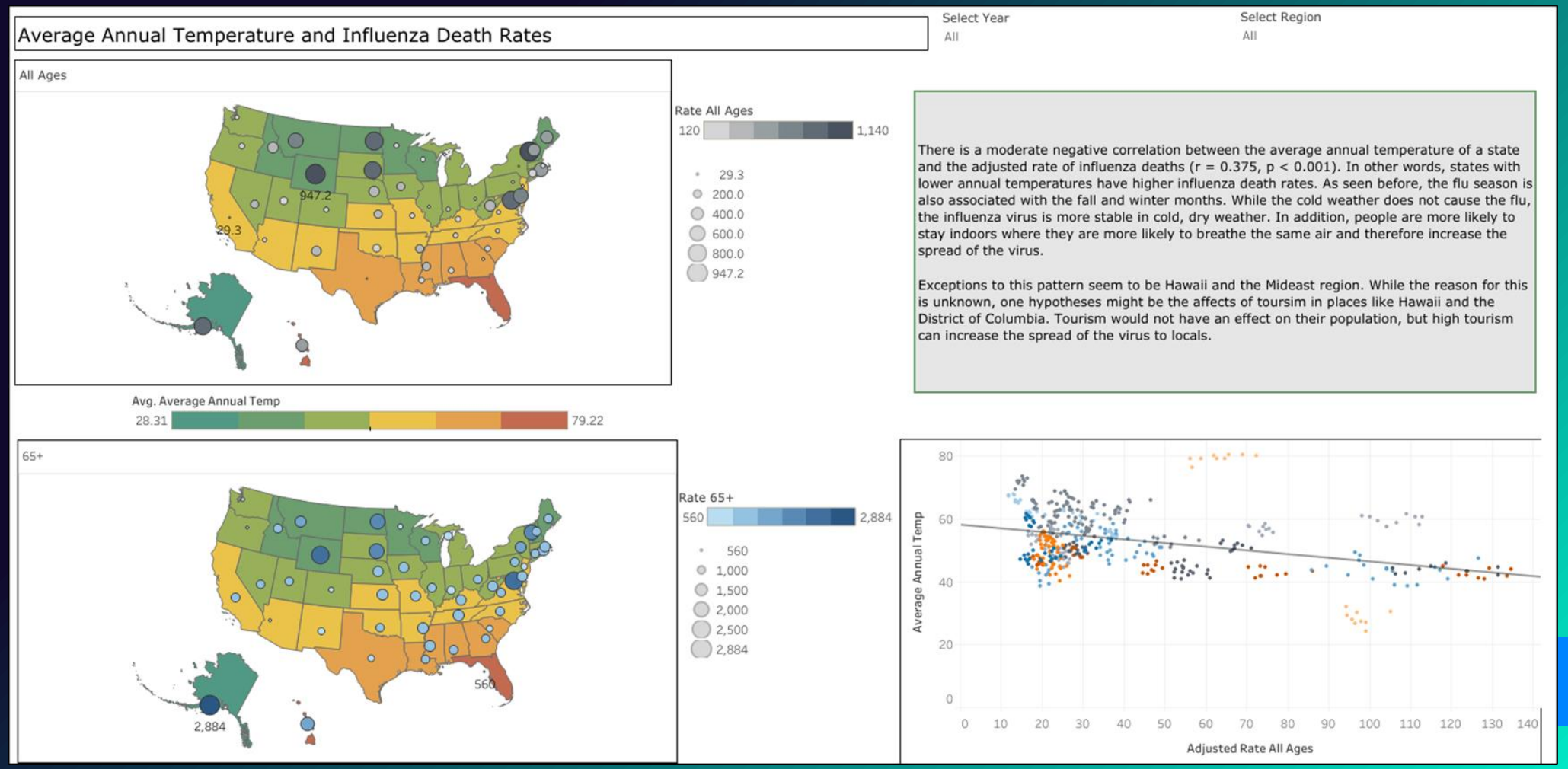
Alaska or Wyoming have the highest influenza death rates for adults 65 and over depending on the year, but Alaska, overall, has the highest. Vermont continuously has the highest influenza death rates for children under 4 years. These are three states that should be considered high priority.





PROJECT 2: Temperature & Influenza Death Rates

Because adjusted rates showed that death rates were not correlated with population, other data was integrated to try to find a correlation. After analyzing several factors, including poverty rates and clinics per 100k, the only correlation was with average annual temperature. This correlation makes sense since the influenza virus is more stable in cold, dry weather.



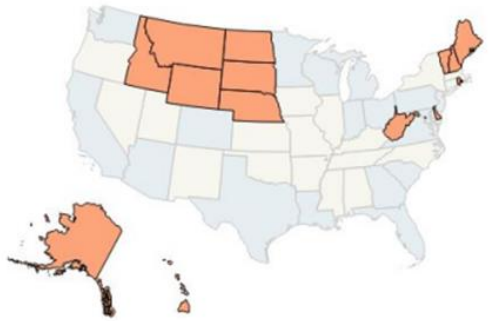
PROJECT 2: Recommendations

Tableau Public Profile

Video presentation

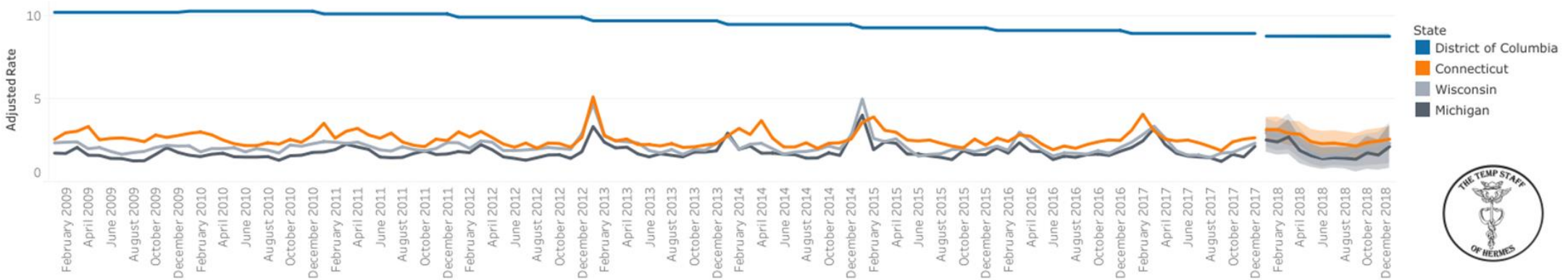
Based on historic death rates of all ages and the predicted death rates of states, the top 15 states we recommend prioritizing are:

-Alaska	-New Hampshire
-Delaware	-North Dakota
-DC	-Rhode Island
-Hawaii	-South Dakota
-Idaho	-Vermont
-Maine	-West Virginia
-Montana	-Wyoming
-Nebraska	



The strongest correlation we found was between the death rates and annual temperature. Population (adjusted) of vulnerable groups was also taken into consideration, but no correlation was found. Therefore, the best defense is to encourage these vulnerable groups to get the flu vaccine as an extra precaution, particularly if they live in states that tend to be cold and dry.

The forecast predicts that all states will peak in January with the exceptions of Connecticut (February), District of Columbia (December), Michigan (March), and Wisconsin (March).



PROJECT 2 TAKEAWAYS

I took a different path on this project than most other students. While most students looked at population counts, I decided to focus on adjusted death rates in order to account for differences in population between states. Without considering adjusted death rates, then all states with large populations, such as California and Texas would end up being “high priority.” This does not take into count that these locations may also have more avilable medical staff. After considering adjusted rates, I was unable to find a correlation with death rates and other available variables. I ended up considering other variables that I had to bring in from outside sources. These factors included poverty rates, available immunization shots, and annual temperatures. Annual temperatures, to my own surprise, ended up having the best correlation with influenza death rates between states. After more research about the conditions in which the viruses thrive, cold and dry weather, the correlation made more sense.

Other issues encoutered was a lack of adequate data regarding immunizations. The provided data set was too small to really say much about the effectiveness of immunizations. While this was not a large part of the analysis, the project brief did mention immunization efforts, and therefore more information on this variable could have been used to address questions regarding these efforts.