

Hi there, my name is Dan and I'm going to introduce this project.

Everyone knows there are some things like smoking and physical inactivity which increases the risk of cancer, but what if there were other contributing factors?

Is there a relationship between where you live and the risk of cancer?

We wondered, does where you live make any difference?

If our hunch is right, location in the United States could have a significant impact on the rate of new cancer cases. (alternate hypothesis)

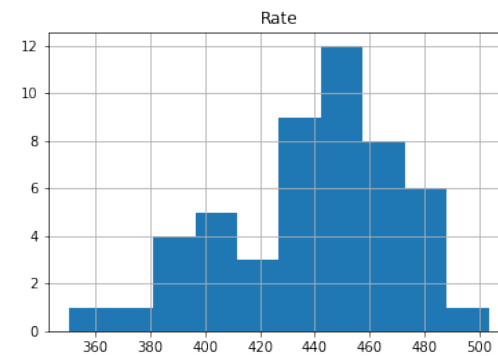
And if we're wrong... it won't matter. (null hypothesis)

- Time zone (longitude) vs. cancer rate
- Location (latitude) vs. cancer rate
- Poverty rate vs. cancer rate in each State

We decided to look for any correlation between longitude, latitude, and poverty rate.

- Latitude and Longitude from Open Weather Map API
- Time zones from Wikipedia
- Geographic regions from Wikipedia
- Poverty and Income data from US Census data API
- Age-adjusted cancer rate data from CDC CSV

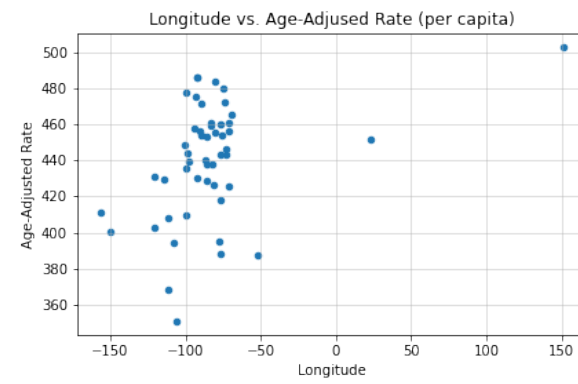
To do this we needed to bring together the latest cancer research data from the CDC, poverty and income data from the US Census Bureau, and latitude and longitude coordinates from Open Weather Maps. We used time zones for longitude and geographic regions for latitude from Wikipedia.



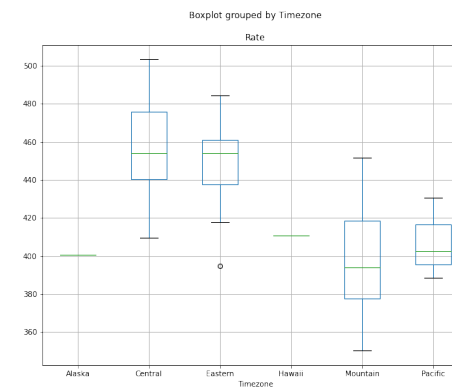
Although we were pretty committed to answering this question, we needed to better understand the data we had. Using just the CDC data, we plotted a quick histogram of the age adjusted case rate per capita. We could see the data is fairly spread. The mean is around 430. The highest frequency is around 455. We also noticed the shape isn't symmetrical around the mean.

I will hand it over to Nati for the Longitude data.

Time Zone (longitude)



Time Zone (longitude)

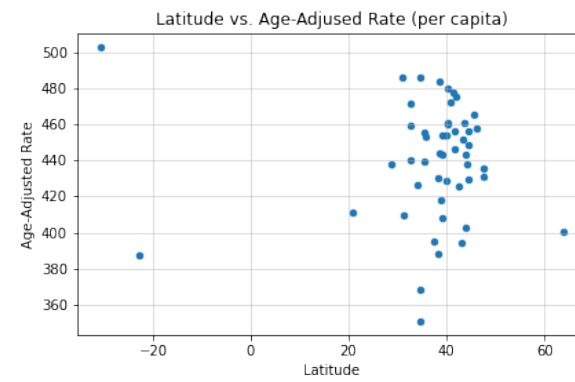


0.00001

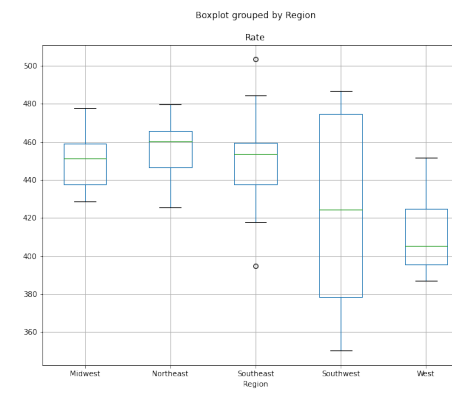
p-value

ANOVA test results for longitude.

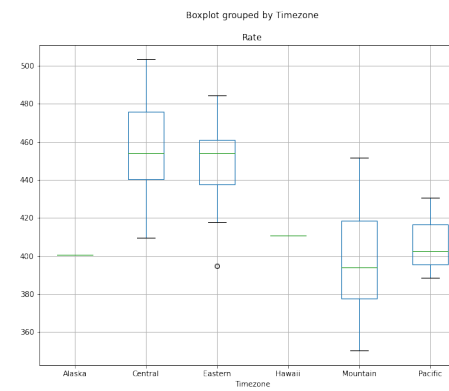
Region (latitude)



Region (latitude)



Region (latitude)



0.18

p-value

ANOVA test results for latitude.

**There is a correlation between
location and risk of cancer.**

Thanks, Liang!

In conclusion, there is some relationship between where you live and the rate of new cancer cases.

Our greatest challenge was in narrowing our focus. Initially we were curious if latitude affected the rate of skin cancer. When we discovered Nevada's case count was suppressed because it was below the threshold, we decided to simplify.

We guessed places with higher altitudes, extreme weather, or excessive sunlight would pose a higher risk. The data showed a moderate nonlinear correlation between the rate of new cancer cases in eastern and central time zones instead.

If we had more time, we would like to know what specific characteristics of those time zones contributed to these findings, is there any common link, and how did income affect it? Poverty is a broad category. Is it a question of access, such food insecurity, or infrastructure, such lead in drinking water?

Q&A

We'll take your questions now.