"THE DECLINE IN U.S. LIFE EXPECTANCY IS UNLIKE ANYTHING WE'VE SEEN IN A CENTURY"

- SARA CHODOSH

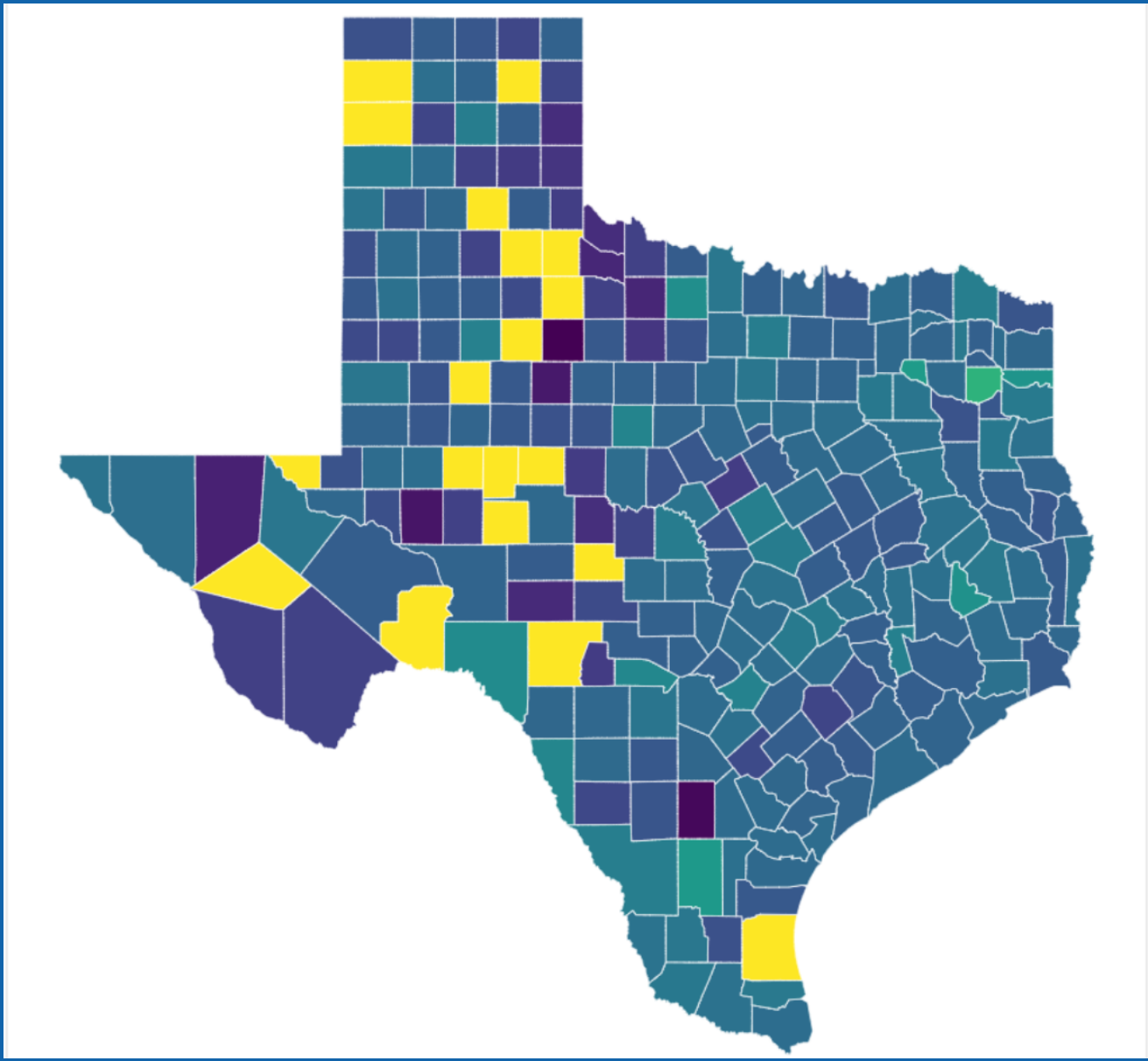
Access to healthcare has come under fire in the past decade as people are becoming more vocal in their demands for healthcare to be considered a right, not a privilege. But what good is increased health coverage without increased physical access to these services? Many

While chain pharmacies have seemingly proliferated urban and suburban cities, the truth is that for large regions in the country a trip to the pharmacy is a day trip rather than a quick errand. For individuals who are older or chronically ill and need constant refills of medications, this can be a substantial burden. Attention has been given to the small number of hospitals in rural America leaving these citizens underserved. This phenomenon has been identified as a medical desert.

The rise of the idea of medical deserts within the US caused us to pose the question: Does a reduction in the number of pharmacies available have a measurable impact on life expectancy?

Using a dataset from the Texas Pharmacy Association, the Google Places API, and information from the US census, we analyzed this question further. We pulled on the county level, collecting the number of pharmacies, the population count, and the geographical area. We are also analyzing median income for each county, considering how this quality factors into the assessment.

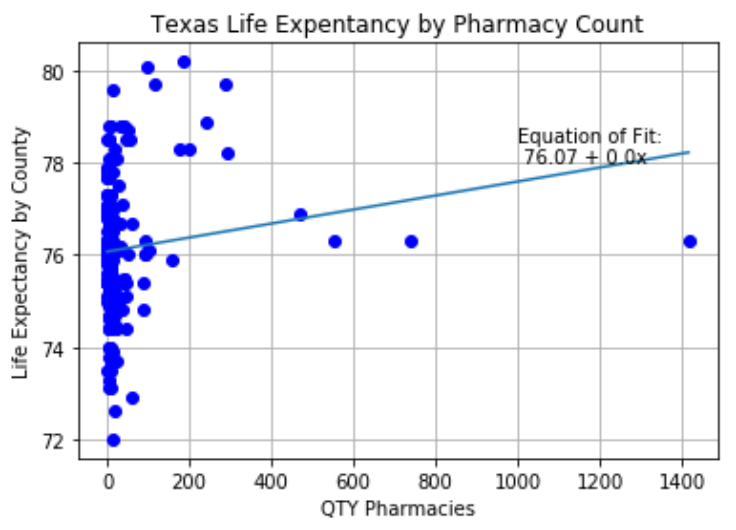
OUR HYPOTHESIS: A HIGHER CONCENTRATION OF PHARMACIES WILL CORRELATE WITH A HIGHER LIFE EXPECTANCY.



Texas offers a unique opportunity to analyze urban, urban cluster, and rural counties. The state also has diverse populations and city areas.

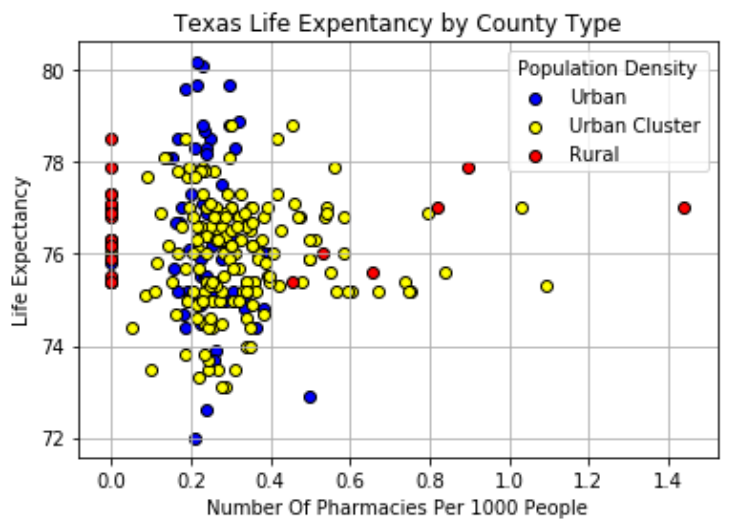
Above interactive heat map shows counties cascaded from yellow to green to blue to purple: least to most in terms of pharmacy concentration. Pharmacy concentration is equal to pharmacies divided by thousands of the population. We can see clear correlations of intensity for counties with big cities. Interestingly, counties with Austin, Houston, and Dallas do not have as strong an intensity as El Paso and Lubbock. This is probably due to populations being so large, therefore taking down the concentration. Also worth noting that yellow zones had no data, not that there are zero pharmacies.

ANALYSIS

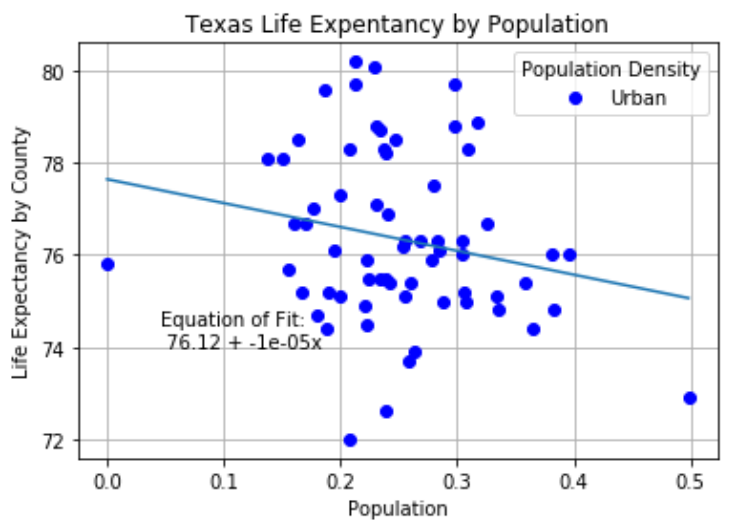


This overview shows the correlation relationship of pharmacy count and life expectancy. Evidence shows a positive relationship between the two, indicating that our hypothesis is true: a higher concentration of pharmacies leads to a higher life expectancy for the county.

We then began to analyze the data variable by variable

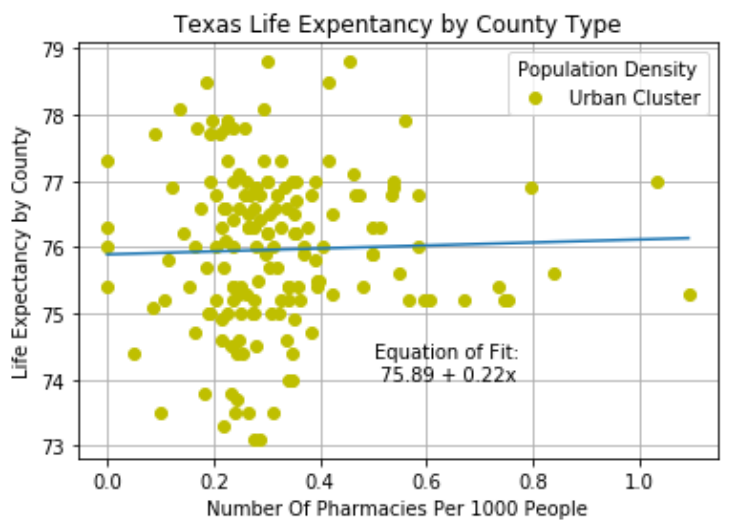


This overview shows the variance of the concentration of pharmacies for different county types and life expectancy. We can see from this visualization that each of our segments has variance on the life expectancy scale, with urban being the largest. Despite having less pharmacies than urban and urban cluster counties, rural counties appear to have a higher median life expectancy. We then began to analyze the data variable by variable.

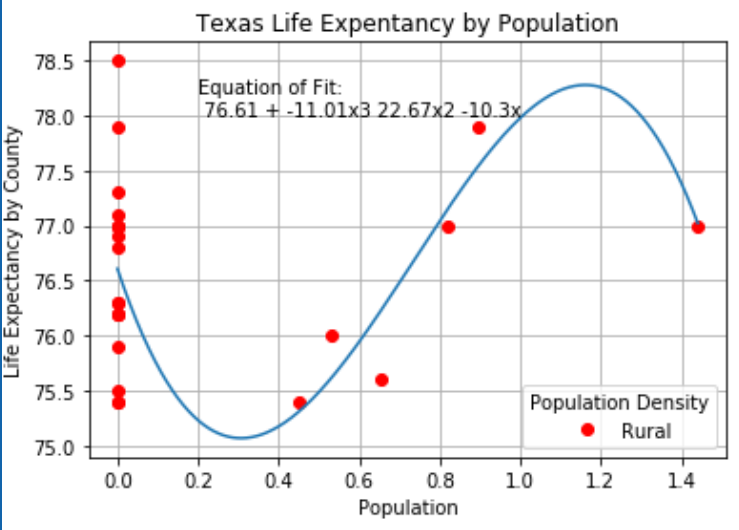


This is the Life expectancy correlated with urban counties, and the independent variable is the number of pharmacies per 1000 people. Most of the data is clustered towards the center with a high intercept. These are counties with more than 500,000 people.

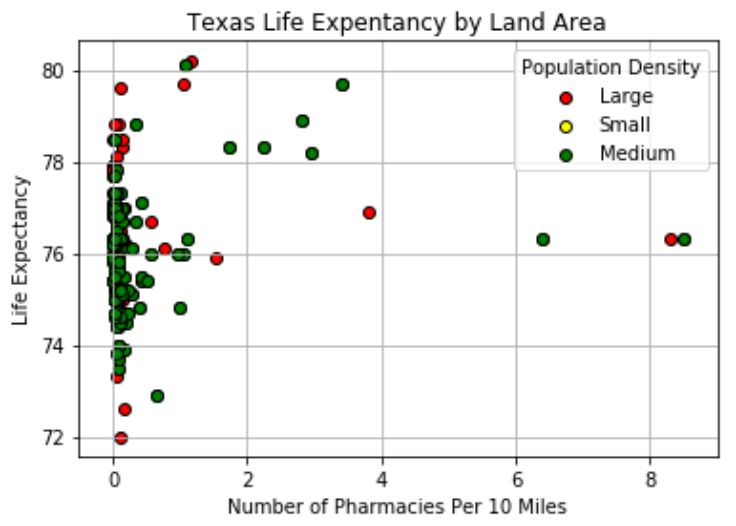
ANALYSIS



This graph represents the life expectancy compared to the pharmacy concentration in urban clusters. These are counties with a population between 250k and 500k people. The concentration of pharmacies is lower and clustered towards the left but there is no obvious pattern.

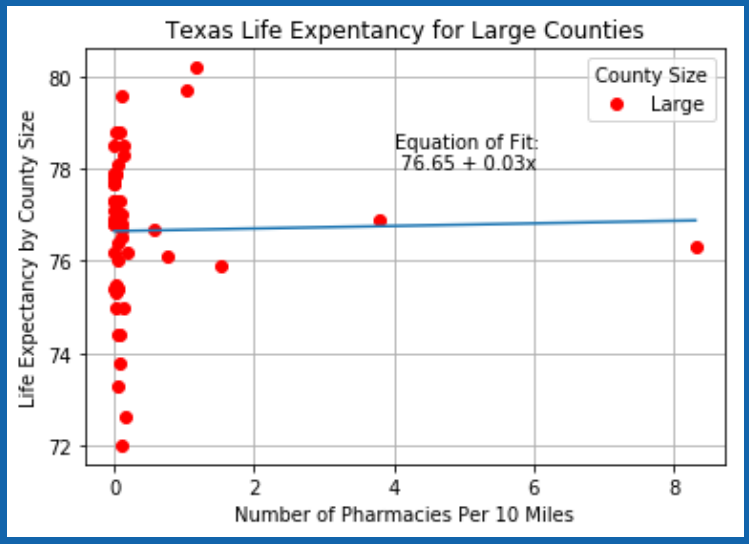


This graph shows the life expectancy by in rural counties that have less than 250k people. The pharmacy concentration correlates to life expectancy for a third degree function but the variation isn't huge as many counties didn't have pharmacies.

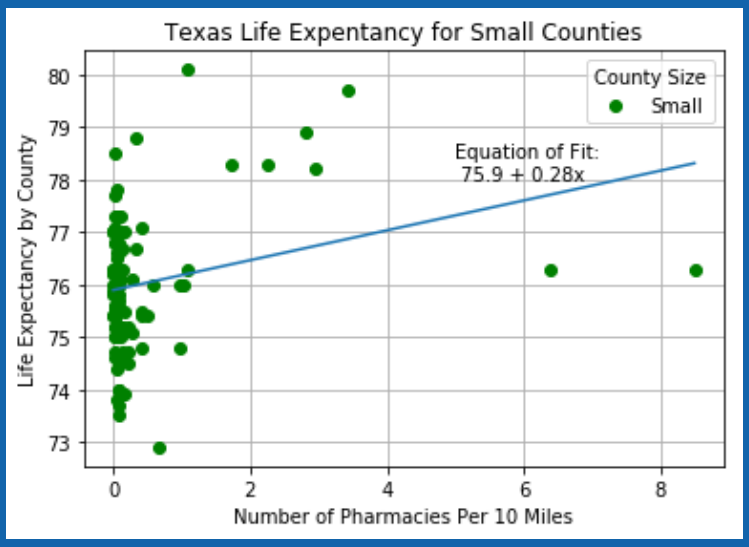


In this graph, we created a different metric, which looked at pharmacies per square mile in counties. In this dataset, we split up the counties by size with the bottom 25% of counties classified as small and top 25% classified as large with the remaining 50% as medium. When we segment out the data we see a similar pattern to above.

ANALYSIS



This graph shows the segment of our data for large counties and most of these do not have any pharmacies or an extremely small number of pharmacies per square mile. The data is clustered to the left and there is a wide range of life expectancies for small counties.



We can see from this visual that small rural counties tend to have the least number of pharmacies per 10 square miles. Amongst our three types of counties, rural counties appear to depend on pharmacy concentration per 10 sq miles the most, with a coefficient of .28 (Urban counties .03, and Urban Cluster counties.22).