

Can income predict the rate of chronic disease per county?

Stormont Vail Health Data

Team: UpperCase - em dash

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External Data Sources

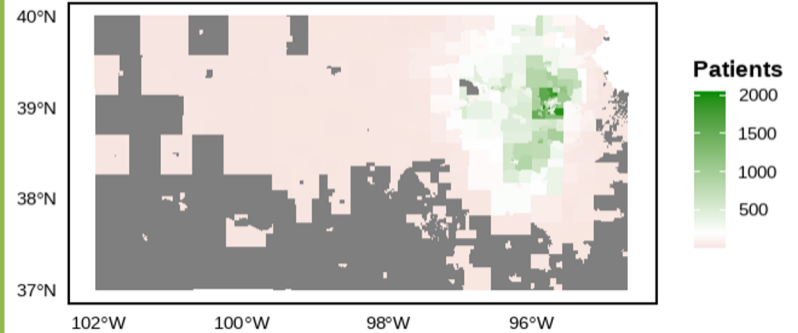
- [NIH](#), “Kansas Income - Table, Median family income”
- [U.S. Census Bureau](#), “TIGER/Line® Shapefiles”
- [NIH](#), “Kansas Population - Table, Races”

- `library(sf)`: shapefiles with county boundaries
- `library(tigris)`: US census geographic data
- `library(leaflet)`: Interactive maps (ex. polygons for counties, departments, legends)
- `library(tidygeocoder)`: converts text to coordinates (aka. the city names to latitude long)
- `library(htmltools)`: for popup formatting



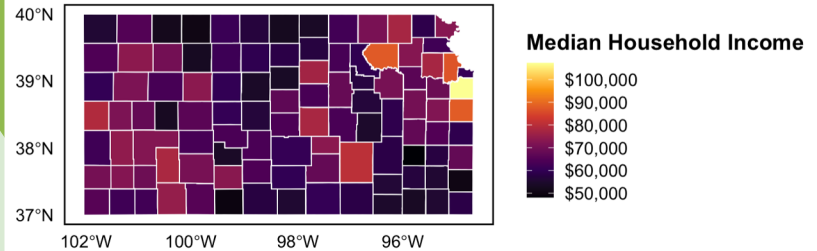
Number of Patients by Census Blockgroup

Source: Stormont Vail Health data

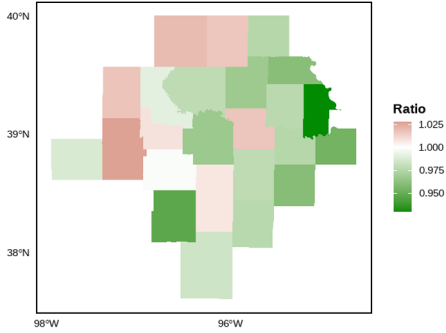


Median Household Income by County — Kansas

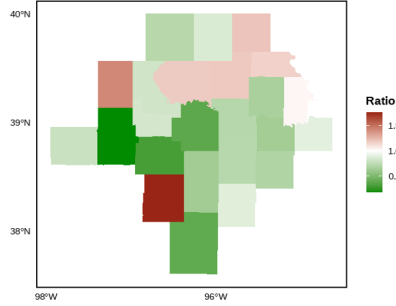
Source: Stormont Vail Health data



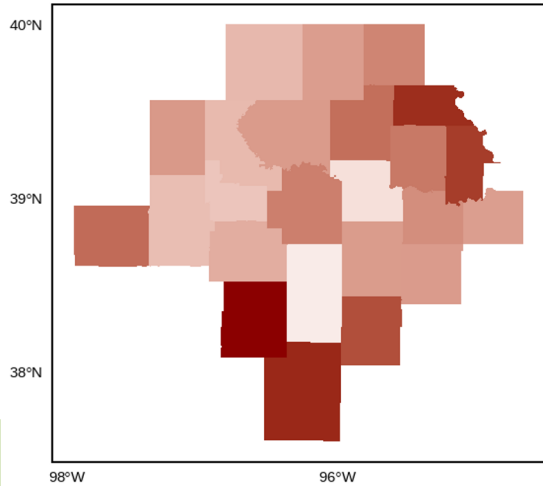
Ratio of White Americans reported in US Census to reported in Patient Data — Kansas
 Source: Stormont Vail Health data and 2020 US Census



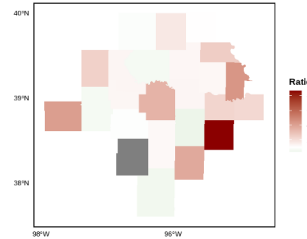
Ratio of African Americans reported in US Census to reported in Patient Data — Kansas
 Source: Stormont Vail Health data and 2020 US Census



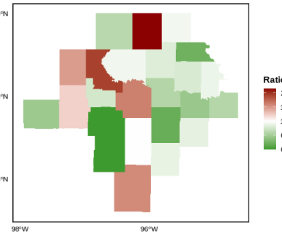
Ratio of Hispanic/Latino Americans reported in US Census to reported in Patient Data — Kansas
 Source: Stormont Vail Health data and 2020 US Census



Ratio of Asian Americans reported in US Census to reported in Patient Data — Kansas
 Source: Stormont Vail Health data and 2020 US Census



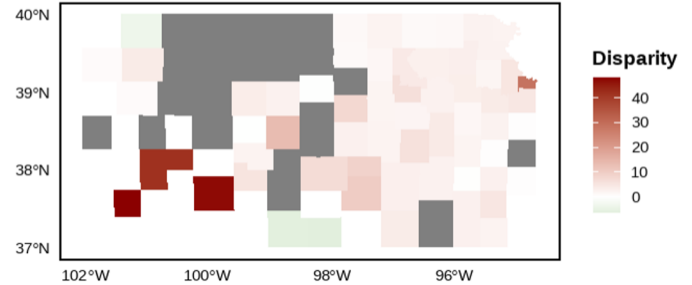
Ratio of Native Americans reported in US Census to reported in Patient Data — Kansas
 Source: Stormont Vail Health data and 2020 US Census



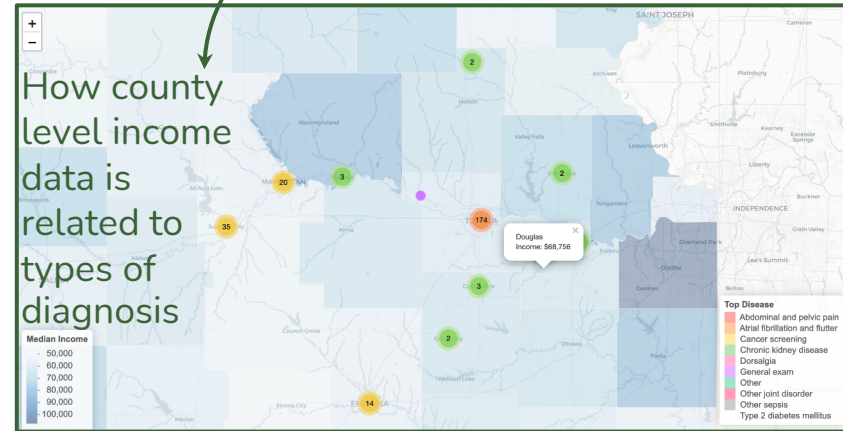
Visualizations

Difference in Percentage of Hispanic/Latino Americans between US Census and Patient Data — Kansas

Source: Stormont Vail Health data and 2020 US Census



(Interactive map demonstration)



US census block group ids -> map to tiger with FIPS

Model

Statistics for model

Term	Estimate	Statistic	p-value
Intercept	0.592	3.951	0
Income (by 10k)	0.048	2.204	0.031
American Indian or Alaska Native	0.027	1.339	0.184
Asian	0.088	1.347	0.182
Black or African American	0.006	0.544	0.588
White	-0.001	-0.610	0.543
Native Hawaiian or Other Pacific Islander	-0.043	-1.068	1.068
Hispanic or Latino	-0.009	-1.042	0.301
Average Age	0.006	2.999	0.004

Steps all:

1. Identify **significant relationships** between **income and rate of chronic disease**
2. **Chronic disease** as **Chronic Not Chronic**
3. **Validation with 10 Rate for a RMSE**
4. **Conducted a linear regression** **geographic data is a weak predictor** **of disease per county** **validation data and other sources of predictors!**