SOC 4650/5650: Lab 3-1 - Health Insurance Rates by County

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Directions

Using data accessed from the `module-3-projections` repository, `USHealth`, and the `US_BOUNDARY_Counties` shapefile, create the maps below related to health insurance rates by county for all fifty states. Your entire project folder system, including data and RMarkdown output, should be uploaded to GitHub by **Monday, March 7th** at 4:15pm.

Analysis Development

The goal of this section is to create a self contained project directory with all of the data, code, map documents, results, and documentation a project needs. Please ensure **all** required elements are present. Make sure you rename instances of `Lab-05` to `Lab-2-2` in your assignments repository. You will need to add the `US_BOUNDARY_Counties` shapefile to your project. You will also need the `US_HEALTH_noIns.csv` and `stateCapitals.csv` files.

Part 1: Data Preparation

The goal of this section is to produce two shapefiles from the raw data provided. These shapefiles should illustrate the percent of individuals lacking health insurance by county in the United States as well as the point location of state capitals.

1. Using `R`, complete the following steps:

   (a) Import the `stateCapitals.csv` data and project it using the included `x,y` coordinate data. Check your projection using `mapview` before exporting the data. The resulting data should be exported as a shapefile with the `NAD 1983` geographic coordinate system applied. The shapefile should be saved to a subfolder of `data/` named `cleanData/` in your lab's folder hierarchy.

(b) Import both the county boundary data and the health insurance data, and complete a table join to combine both data sets.

(c) There are some values of `-1` in the insurance data. Those are "missing" counties that the CDC does not provide insurance rate estimates for. To remove them, subset your observations so that you only have observations remaining where the variable `noIns` is greater than or equal to `0`.

(d) The resulting data should be exported as a shapefile with the `NAD 1983` geographic coordinate system applied. The shapefile should be saved to a subfolder of `data/` named `cleanData/` in your lab's folder hierarchy.

(e) Calculate map breaks for the `noIns` variable.

(f) You should download the state geometric data from `tigris` and make a copy for mapping the contiguous United States (i.e. the "lower 48"), removing Alaska, Hawaii, and other territories. Additionally, make Hawaii and Alaska specific copies of these data.

(g) Also subset out Alaska and Hawaii from your state capital and health insurance data, creating both a "lower 48" version of these data as well as Hawaii and Alaska specific copies of these data.

Part 2: Mapping Health Insurance Data for the Contiguous United States

The goal of this section is to produce a stand-alone map of the contiguous United States (i.e. the "lower 48" states) that shows the percent of individuals lacking health insurance by county.

2. Select a projected coordinate system for this map that is appropriate for mapping the contiguous United States (i.e. the "lower 48") - either the Albers or Lambert projected coordinate systems, and set all of your data to that projection..

3. Using `ggplot2`, create a thematic choropleth map (with map breaks) for that shows variation in the number of individuals without health insurance. You should overlay the state boundaries (symbolized with a hollow fill) to make it easier to identify states that have not seen large decreases in the uninsured population since the introduction of the Affordable Care Act.

4. Export the map image as a `png` file.

Part 3: Mapping Health Insurance Data for Alaska

The goal of this section is to produce a stand-alone map of Alaska that shows the percent of individuals lacking health insurance by borough (the equivalent of counties in Alaska).

5. Change the projected coordinate system of your Alaska specific data so that it is appropriate for mapping Alaska - the Albers state system for Alaska.

6. Using `ggplot2`, create a thematic choropleth map (with map breaks) for that shows variation in the number of individuals without health insurance. As before, you should overlay the state capital of Alaska as well as the state boundary.

7. Export the map image as a `png` file.

Part 4: Mapping Health Insurance Data for Hawaii

The goal of this section is to produce a stand-alone map of Hawaii that shows the percent of individuals lacking health insurance by county.

8. Change the projected coordinate system of your Hawaii specific data so that it is appropriate for mapping Hawaii - the Albers state system for Hawaii or the appropriate UTM Zone.

9. Using `ggplot2`, create a thematic choropleth map (with map breaks) for that shows variation in the number of individuals without health insurance. As before, you should overlay the state capital of Hawaii as well as the state boundary.

10. Export the map image as a `png` file.