SOC 4650/5650: Lab-09 - Health Insurance Rates by County

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Directions

Using data accessed from the `lecture-10` repository, `USHealth`, and the `USBoundary.gdb` geodatabase, create the maps below related to health insurance rates by county for all fifty states. Your entire project folder system, including data and notebook output, should be uploaded to GitHub by **Monday, April 2nd** at 4:15pm.

Part 1: Analysis Development (Review from Lectures 01 and 02)

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. Make sure to include all relevant directories, a well formatted notebook, and a 'README' that traces the changes you make to all of your data.

Part 2: Data Preparation

1. Add the following data to a subfolder of `data/` named `rawData/` in your lab's folder hierarchy:

    (a) In `ArcCatalog`, open the `USBoundary.gdb` geodatabase in the course data release and export the U.S. county boundary data to a shapefile.

    (b) Copy-and-paste the file `US_HEALTH_noIns.csv` from the `US_HEALTH` folder in the course data release.

    (c) Copy-and-paste the `stateCapitals.csv` data from the `lecture-10` repository.

2. 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 `leaflet` before exporting the data. The resulting data should be exported as a shapefile with the `NAD 1983` geographic coordinate system applied.

(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.

Part 3: Mapping Health Insurance Data for the Contiguous United States

3. In a new map document, add both the county health insurance estimate and state capital shapefiles created in the previous section. Also add the state boundary data from `USBoundary.gdb` to your map.

4. 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.

5. Create a thematic choropleth map for that shows variation in the number of individuals without health insurance. Make sure to use a Color Brewer palette as well as Jenks Natural Breaks with 5 data classes for your symbology.

6. 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.

7. Export the map image as a `pdf` at `300dpi`,

Part 4: Mapping Health Insurance Data for Alaska

8. In a new data frame, copy the data from the previous section and change the extent of the map so that it shows only Alaska. Notice the counties that are white - these are the counties that had missing data that we managed in our query in the first section.

9. Change the projected coordinate system of this second data frame so that it is appropriate for mapping Alaska - the Albers state system for Alaska.

10. Re-position your map image to accommodate any changes to the shape of your data.

11. Export the map image as a `pdf` at `300dpi`.

Part 5: Mapping Health Insurance Data for Hawaii

12. In a new data frame, copy the data from the previous section and change the extent of the map so that it shows only Hawaii.

13. Change the projected coordinate system of this third data frame so that it is appropriate for mapping Hawaii - the Albers state system for Hawaii.

14. Re-position your map image to accommodate any changes to the shape of your data.

15. Export the map image as a `pdf` at `300dpi`.