SOC 4650/5650: PS-05 - Population Health and Health Care Resources in Missouri

Christopher Prener, Ph.D.

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Directions

Using data accessed from the course data release and a mini data release in the `lecture-09` repository, create the maps below related to health outcomes and resources in Missouri. Your entire project folder system, including data and notebook output, should be uploaded to GitHub by **Monday, March 26th** 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: Mapping Low Birth Weight by County

The goal of this section is to be able to create a county-level map in `R` that shows how low birth weight rates vary across Missouri.

1. Load the Missouri county shapefile from `tigirs` and the file `MO_HEALTH_lowBirth.csv`, which can be found in the course data release under `DataLibrary/CourseData/MOHealth`.
2. Complete a table join of the birth weight data to the county geometry after checking to make sure that the identification variables are properly formatted.
3. Normalize the count of low birth weight babies by the total number of children born in each county.
4. Create a well-formatted preview map of low birth weight rates in Missouri by count. Make sure to include all necessary additions and to use an appropriate color palette. Export the map as a `.png` file at 300 dpi.

5. Export these data as a shapefile and open them in ArcGIS. Recreate the map in ArcGIS in a new map document.

Part 3: Mapping Hospitals Offices

The goal of this section is to be able to create a map showing the density of hospitals per square mile in Missouri by county.

6. Using the same county data in `R`, convert the `ALAND` variable to a measure of square miles per county. Export these data so that they can be mapped in ArcGIS.
7. Load the county data you've just created into a *new data frame* of the map document you've already created. Also add the hospitals point data from the `lecture-09` mini data release.
8. Complete a spatial join to calculate the number of hospitals per county for each county in Missouri.

Part 4: Final Map Production

The goal of this section is to combine both the low birth weight data and the hospital data into a single map product.

9. Create a map layout that has both the low birth weight data and the data on the number of hospitals normalized by square miles on the same map layout. Make sure to add all necessary titles, labels, notes, and legends. Export the map as a `.pdf` file at 300 dpi.

Part 5: Finding the Closest WIC Office

The goal of this section is to be able to create a new shapefile that contains the closest WIC office to each hospital in Missouri.

10. Load both the hospital point data and the WIC office data from the `lecture-09` mini data release into a *new data frame* of the map document you've already created.
11. Complete a spatial join to identify the closest WIC office to each hospital. The final feature should have a row for each hospital with the data on the closest WIC office appended to it.
12. Export these data to a shapefile that we can inspect as we grade this assignment.