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G5063: Data Visualization

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Group G Project Proposal: Health and Nutrition Patterns in the United States

Final group project (30%): A final group project (3-4 students) presented in the form of a website and accompanying project book. You will analyze data of your own choosing and report the results using (1) static images based on ggplot2, (2) maps using geospatial data, (3) visualizations of text analyses, and/or (4) network visualizations AND (5) prepare a hosted, interactive display of some of your visualizations. There will be in-class presentations of the final projects (if class size allows).

Summary

Our group aims to use the skills developed from this data visualization course to focus on an array of narratives pertaining to health and nutrition data in the United States. We intend to explore, analyze, and visually present the following:

1. Explore the current state and relationship of health and nutrition in the United States (comparisons by state, race, etc)
2. Analyze how the trend has changed over time (time series)
3. Identify the challenges to fixing malnutrition and obesity in the United States
4. Display the potential health outcomes for increased spending in the healthcare and education sector in the United States

5. Recommendations to improve longevity and well-being for people in the United States

Sections

1. **The current problem** – Obesity epidemic spreading across the U.S (Interactive map of residents in the US getting plumper)
    a. Inter-state comparisons, i.e., 50 states
    b. Inter-race comparisons, i.e., Different races in the US
    c. International comparisons, i.e, US vs developed countries in G7, or US vs other countries in G20
2. **Time-series**
    a. How have people's health deteriorated (or improved in some respects) in the US over the years – line graphs, heat maps (interactive)
3. **Why is it so challenging to fix? What are the variables involved?**
    a. Fast food location geospatial maps
    b. People do not really know what to eat — the food pyramid and measure of healthy foods keep changing
    c. Ultra-processed food (UPF) consumption is very high due to its convenience and a large segment of the population does not know how it negatively affects their health
4. **Attempts at improving the health of the general public**
        i. Vegan / vegetarianism
        ii. Other health fads: paleo, intermittent fasting, etc
            1. Building graphs based on the number of Google searches

2. Studies pertaining to weight loss as a result of new diet plans

5. **Outcome (What are the potential solutions?)**
    a. Increased healthcare spending in the US vs. The healthcare spending in other developed countries in G7
    b. Comparisons between average body weight (sex, race, state, nationality)
    c. Mortality rates
        i. Inequality: The lifespan of top income decile in the US is probably high
6. **Education/Accessibility (location and prices)**
    a. Where to put healthier food options (interactive maps)
    b. Subsidies to fast food (interactive graphs with ggplotly)
    c. Education - How it starts with you (Data table of foods' nutritional information)

Visualizations

1. Static images based on ggplot2
    a. Line graphs with percentages of Americans with different health conditions across time
    b. Line graphs comparing the United States to other G20 countries on mortality across time
    c. Mortality rates in the US by income decile
    d. Flipped axes bar graph showing data for a panel of different health conditions by state
    e. Flipped axes bar graph showing data for a panel of different health conditions by race

    f. Something around the rise of vegan / vegetarianism
        i. Has it plateaued?

2. Maps using geospatial data
    a. Fast-food restaurant locations
    b. A map of the United States showing the percentage of fast food restaurants out of total restaurants in a given county or state (shade from blue to red by percentage)
    c. A panel of a map of the United States showing the percentage of a given health condition in a given county or state (shade from blue to red by percentage)
    d. [Knowledge in different parts of the country]
3. Visualization of text analyses
    a. Cities in America with the least healthy populations – the size of the text
        i. Across different metrics
    b. Panels with the most common fast food restaurant in a given state – size of text
    c. Foods with the greatest amount of saturated fat / [unhealthy substance]– the size of the text
4. Network visualizations
    a. [xx]
5. Hosted, interactive display of some visualizations
    a. Show the United States map getting plumper over time, i.e., inflating
    b. Something around the growth of UPFs over time
        i. It's a GIF and the food pops up in the year the product was released
    c. GIF of how the food pyramid has changed over time with food icons moving up and down the levels

d. Data tables with foods and columns give you nutritional information, i.e., calories, saturated fat, trans fat, vitamins, etc.

Data sources

- https://catalog.data.gov/dataset/u-s-chronic-disease-indicators-cdi
- https://www.americashealthrankings.org/explore/annual/measure/Obesity
- https://researchguides.dartmouth.edu/c.php?g=517073&p=6289098