Healthcare Insurance & Hospital Prevalence In the United States:

An analysis of Healthcare Access and Availability

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Introduction

Of all high-income OECD nations, the U.S has the highest percentage of the population without health insurance. In 2021, 8.1% of the U.S population was living without health insurance (Gunja et al., 2023). This issue is exacerbated in the context of the privatised U.S healthcare system which is dependent on an individual's ability to pay. The high cost of medical services, medications and treatments often gatekeeps care from individuals in lower-income brackets, or leaves individuals in high levels of debt. This leads to numerous preventable deaths occurring every year in the U.S. For example, over 44,000 American's of working age die each year because they lack health insurance (PHNP)

Analysing the percentage of the population without health insurance on a County-by-County level can provide an insight into the areas that are most affected by healthcare inequality. From this we can construct recommendations to address these issues.

SDG3 – Good Health & Well-Being

My topic of choice is related to the third sustainable development goal. This goal aims to ensure healthy lives and promote well-being for all, at all ages.
In particular, my chosen topic related to the following sub-goals of SDG3.

SDG - target 3.8: "Achieve universal health coverage, including financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality, and affordable essential medicine and vaccines for all.

This subgoal is directly related to the contingency of American healthcare on an individual's income and ability to pay. The privatization of the healthcare system directly affects the low-income individuals and directly contradicts this sub-goal's incentive of affordable and accessible healthcare for all.

Analysis

Map 1 displays the percentage of each counties population that is living without healthcare insurance with the darker colours indicating a higher percentage of the population without healthcare insurance. From this map we can clearly identify the states that are most affected by a lack of coverage across the population. In some states there is only a particular county or cluster of counties with low healthcare coverage such as the western side of South Dakota and two counties in New Mexico. However in other cases, we can see that the majority of Counties in the state suffer from a high percentage of uninsured individuals such as Texas, Georgia, Idaho and Florida. For example, in Texas is a clear outlier in the fact that the high majority of counties have an uninsured population of 20% - 30%. The 34 counties with the highest uninsured population are all within Texas, with Duval County having the highest uninsured population percentage of 37.28%. The County with the lowest percentage of uninsured people is Norfolk County in Massachusetts with a percentage of 2.16% of individuals uninsured. Across all Counties, the average percentage of uninsured individuals is 12%.

Map 2 displays the State-by-State amount of hospitals normalised by the state population along with the point layer data of every hospital in the U.S. The states are coloured to display that a darker colour indicates a higher ratio of hospitals to individuals. The point layer data of hospitals are coloured to represent the number of rooms in each hospital. Across the United States, there are 89 hospitals with more than 750 rooms, these hospitals mainly comprise of capital city hospitals and university hospitals in densely populated areas. The mean number of rooms in hospitals across the U.S is 142, with Orlando Regional Medical Centre in Florida having the highest number of beds (1,738). From the map we can identify that mid-western States have the highest ratio of hospitals to State population. States with high populations on the other hand have a lower ratio of hospitals to population such as California and New York. However, as previously mentioned, hospitals in these states have much higher capacities, meaning that there is less need for a higher number of hospitals. This is also reflected when analysing and comparing the number rooms in hospitals in California and comparing that to the mid-western states such as Kansas and Nebraska. In major cities such as Los Angeles, there is a dense cluster of hospitals with rooms ranging from the 101-250 category up to the 750+ rooms category. Whereas in the dark blue mid-western states with a less dense and smaller population, the majority of hospitals fall into the 0 – 100 rooms categories.

Cross-Analysis: When comparing both maps to one another we can use the information gained by both to draw conclusions regarding which areas in the U.S suffer the most in regard to healthcare. In **map 1** we can see that counties in mid-western states such as Nebraska, Wyoming and Idaho have a high percentage of the population that do not have health insurance. In **map 2** we can see that these states have a high ratio of hospitals to the state's population, but upon further investigation we can identify that the hospitals within these states fall into the lower categories of 'rooms per hospital', with the majority of these hospitals having less than 100 rooms.

We also saw in **map 1** that **Texas** contains the counties with the highest rate of uninsured individuals. However, **Texas** ranks higher than other highly populated States on the ratio of hospitals to state residents.

References & Data

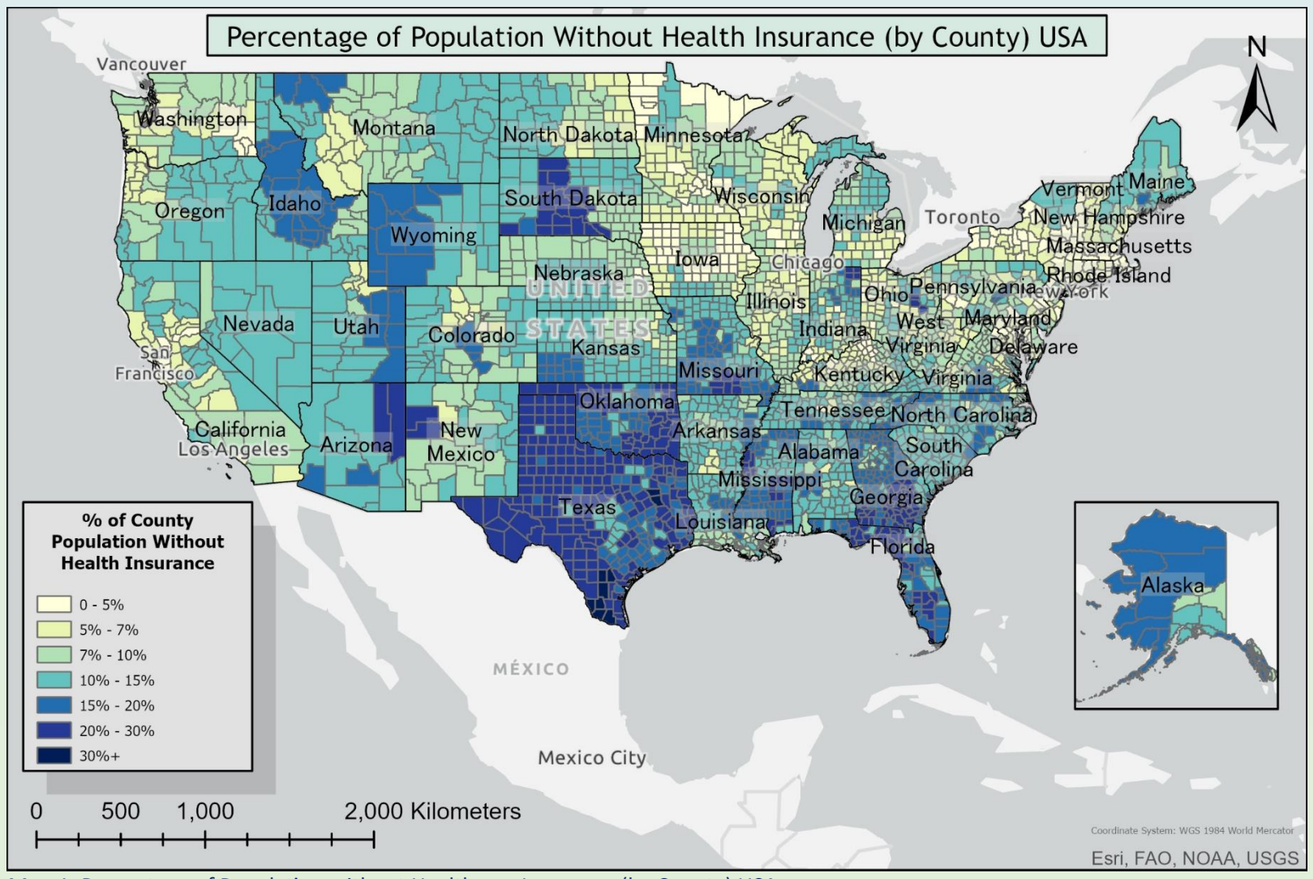
1. Gunja, M. Z., Gumas, E. D., & Williams II, R. D. (2023, January 31). *U.S. Health Care from a Global Perspective, 2022: Accelerating Spending, Worsening Outcomes*. Home | Commonwealth Fund.

2. *State, County, and Local Estimates of the Uninsured Population: Prevalence and Key Demographic Features*. ASPE.

3. Kansas Hospital Association (KHA)., Hospital-Specific Data: https://www.kha-net.org/DataProductsandServices/STAT/HospitalUtilization/Hospitals/

4. Open Data Soft (ODS)., US Hospitals Records: https://discovery.opendatasoft.com/explore/dataset/us-hospitals/map/?q=us&location=8,40.15789,-98.50616&basemap=jawg.light

5. The Assistant Secretary for Planning and Evaluation (ASPE)., State, County, and Local Estimates of the Uninsured Population: Prevalence and Key Demographic Features (2021/03/11): https://aspe.hhs.gov/reports/state-county-local-estimates-uninsured-population-prevalence-key-demographic-features



Map 1: Percentage of Population without Healthcare Insurance (by County) USA

Data & Methodology

Map 1

This map was created using data gathered from The Assistant Secretary for Planning and Evaluation (ASPE). The csv dataset featured State and County-level data for the uninsured population as well as key demographic features. The map was also made using a County-level shapefile. The csv data containing various attribute of the uninsured population was joined to the County boundaries shapefile. The join was made across the common attribute "FIPS code" (Federal Information Processing Standards) which uniquely identifies counties. The uninsured population percentage was then used to symbolise each county using graduated colours.

Map 2

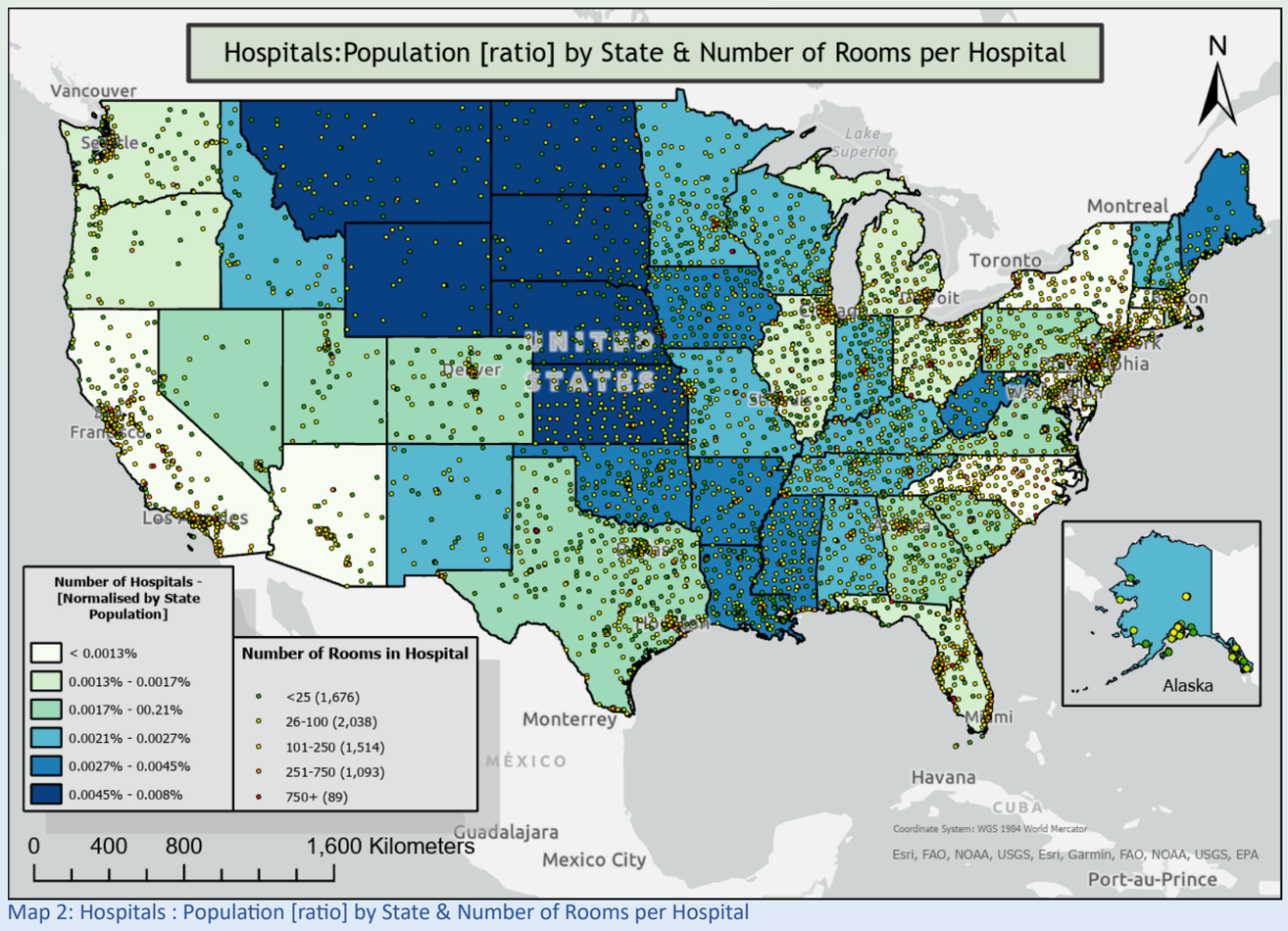
The data in map 2 for hospital coordinate data was gathered from OpenDataSoft. The dataset consisted of a csv file of all hospitals and a range of attributes, and a shapefile format of the point layer data of each hospital. This data set however, was missing some crucial data. Namely, the number of rooms in each hospital for the entire state of Kansas was null. To correct this error I used data from the Kansas Hospital Association (KHA) which has a dataset with the necessary data for each Kansas hospital. Unfortunately, due to a difference in naming scheme, the number of rooms in each Kansas hospital in the KHA dataset had to be manually imputed into the OpenDataSoft attribute table. I used manually assigned intervals to split the 'number of rooms' layer into five categories and used appropriate symbology to represent the layer accordingly. A State-level shapefile containing population information was gathered from the ArcGis Hub. The number of hospitals in each state was calculated and added to a new attribute of the shapefile using the 'select by location' feature selection tool. The ratio of hospitals : population was the calculated and added to a new attribute using the 'calculate field' function.

Conclusion

In conclusion, from the two maps we have seen that from a county-level prospective, the issue of people living without health insurance is a state-level issue. Although percentages of uninsured individuals varies from county-to-county, when crossing over a state line these percentages can change drastically. Areas such as **Texas, Georgia, Florida** and **South Dakota** have the highest rates of uninsured populations. This is a concerning reality when considering the U.S. healthcare systems' dependency on an individual's ability to pay for medicine or treatment. We have also seen that although states with higher populations have a lower ratio of hospitals to population, the hospitals within these states have much more rooms and resources. This highlights the need for the improvement and expansion of hospitals in areas such as the Midwest, where most hospitals have less than 100 rooms.

Impact & Recommendations

The high percentage of uninsured population in particular Counties in the U.S. may be indicative of the socioeconomic position of the individuals within that County. By expanding the U.S. public healthcare system "Medicare", thousands of preventable deaths can be prevented every year. The SDG's intend on ensuring equality and healthcare for all. This would be a step in the right direction for obtaining this goal. A portion of State and Federal budgets could be allocated to increasing the availability of the healthcare system. This could be done by expanding existing hospitals (which as we have seen is necessary in mid-western states) or building new hospitals which would increase the hospital : population ratio in high-population states like **California, Texas** and **New York**.



Map 2: Hospitals : Population [ratio] by State & Number of Rooms per Hospital