Modeling Healthcare Access in U.S. Counties: A Multivariate Analysis of Socioeconomic and Environmental Factors

1. Project Title

Modeling Healthcare Access in U.S. Counties: A Multivariate Analysis of Socioeconomic and Environmental Factors

2. Background

Across the United States, rising housing costs, uneven access to services, and regional disparities are making relocation decisions more complex. Households with varying needs—from young families to retirees—require tailored insights to make informed decisions about where to live. This project proposes a data-driven approach to identify suitable counties based on quality-of-life indicators.

This project will begin by focusing on healthcare accessibility, a crucial pillar of livability across demographic groups. The initial phase will construct a composite Healthcare Access Score and examine its relationships with socioeconomic indicators. The dataset is designed to be wide, flexible, and modular—positioned as the first installment of a broader portfolio exploring education, housing, climate resilience, and equity across U.S. counties.

3. Objectives

- To identify the most suitable U.S. counties for four distinct household types

- To integrate and analyze county-level data with a primary focus on healthcare access

- To construct a wide, reusable dataset as a foundation for future livability projects

- To segment counties into clusters based on healthcare and related livability factors

- To build an interactive Tableau dashboard for stakeholder exploration

4. Scope of Work

The project will include:

- Data sourcing and integration from at least seven public datasets

- Preprocessing and imputation for missing data

- Creation of a composite Healthcare Access Score

- Exploratory data analysis and clustering

- Predictive modeling and regression analysis

- Visualization of findings using Tableau

Excluded from scope:

- Individual-level predictions

- Data from private, paywalled, or restricted-access sources

5. Target Households

Young Families: 2 adults + 1 child | Needs: Safety, education, healthcare | Constraints: Affordability, crime rate

First-Gen Immigrants: 2 adults + 1 child | Needs: Diverse, inclusive areas | Constraints: Language, affordability

Young Professionals: 1 adult | Needs: Jobs, social life | Constraints: Income, commuting

Empty Nesters: Adults 50–65 | Needs: Calm, healthcare, affordability | Constraints: Fixed income, access to care

6. Methodology

1. Data Collection & Preparation:

   - Integrate datasets using FIPS codes

   - Validate and clean input data

2. Feature Engineering:

   - Normalize indicators

   - Construct composite indexes (e.g., Healthcare Access Score)

3. Analysis:

   - Conduct descriptive statistics and correlation analysis

   - Apply clustering to identify livability segments

   - Run regression models to explore predictor relationships

4. Visualization & Delivery:

- Build Tableau dashboard with filters by household group

- Produce summary briefs for each cluster type

7. Data Sources

- file_1 – Population and geography (U.S. Census)

- file_2 – Health and social metrics (County Health Rankings) – Main data source

- file_3 – Cost of Living Index (World Population Review)

- file_4 – Median Household Income (ACS)

- file_5 – Age, race, and ethnicity (ACS)

- file_6 – State/local tax rates (Tax Foundation)

- file_7 – Fair Market Rent (HUD)

8. Deliverables

- Cleaned and merged dataset (CSV or Excel format)

- Tableau Public dashboard with interactive filtering

- Exportable profiles for each cluster group

9. Ethical Considerations

All data used in the project will be sourced from public, open-access federal, and non-profit repositories. Care will be taken with sensitive variables such as crime rates, which may be underreported in certain counties. Metrics will be contextualized to avoid misrepresentation or unjustified comparisons.

10. Intended Users / Stakeholders

- Households considering relocation

- Public policy researchers

- Urban planners and nonprofits

- Data-driven platforms or apps offering relocation guidance