

## Using Data Science to Analyze Healthcare Consumption Trends

The increasing costs of healthcare in the United States and its impact on individuals, policymakers, and healthcare providers have made understanding consumption patterns critical. With personal consumption expenditures (PCE) data available through the Bureau of Economic Analysis (BEA), analyzing historical trends and predicting future spending provides an invaluable opportunity to support better resource allocation and decision-making across the healthcare sector.

This analysis focuses on consumption trends within key healthcare divisions—outpatient services, hospital services, nursing home services, and more—and aims to reveal the evolution of expenditures over time. Insights from this analysis will not only illuminate patterns in healthcare consumption but also assist stakeholders in identifying areas of growing demand and aligning resources accordingly.

### The Deliverable

In alignment with these objectives, the BEA seeks an analyst to perform a comprehensive data analysis of healthcare consumption trends. Your task is to:

1. **Analyze Historical Data:** Conduct exploratory data analysis (EDA) to uncover spending patterns across healthcare sectors over the past two decades. Include visualizations such as moving averages to observe trends and identify outliers or anomalies.
2. **Generate Insights and Recommendations:** Based on your analysis, highlight sectors with the fastest growth in spending and identify the potential economic factors influencing these trends. Provide actionable recommendations for stakeholders, including policymakers and healthcare providers, on resource allocation.

### Impact of Your Work

The deliverable will be a comprehensive report that:

- Explains historical trends in healthcare consumption.
- Accurately demonstrate the alignment of moving averages across sectors to better understand how spending in different areas is correlated over time
- Identifies growth areas in healthcare spending and potential drivers behind these trends.

By creating this analysis, you will contribute to enhancing the understanding of healthcare consumption patterns and ensuring informed decision-making in an industry that directly impacts the well-being of millions. The results will enable stakeholders to allocate resources effectively to meet growing demands and address challenges within the healthcare sector.

GitHub Repository: <https://github.com/tracyhua2/DS4002-CS3.git>