Project 1: A glance into​ US Healthcare Expenditures &​ Health Outcomes

Team: The Outliers

Objective: The relation between total population and enrollment in Medicare between 2010 to 2017 in the US.

The purpose of this report is to analyze the trends in total population and Medicare enrollment across U.S. states from 2010 to 2017. Utilizing data from the U.S. Census Bureau and Medicare enrollment statistics, this report seeks to understand how population changes correlate with Medicare enrollment eligibility and actual enrollment figures.

There were two data sets for this analysis one is the census data and the second is the Medicare data. Both data sets were cleaned in order to find reading usable for this data. The census data presented more challenged due to having nan characters, and the columns descriptions were improved changing larger description to more easy reading description for example: in the census data from ‘Acsst5Y2010.S0101-Data.1.2’ to ‘Year’, ‘Geographic Area Name’ to ‘State’ or ‘Total Estimate Total Population’ to ‘Total population’, ‘Total Estimate Selected Age Categories 65 Years and Over’ to ‘Age Categories 65 Years and Over’:

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*Table 1: Census\_data*

On the other dataset, the medicare\_data I applied the same cleaning process to change the description from ‘Y2010, Y2011, Y2012, Y2013, Y2014, Y2015, Y2016, Y2017’ to ‘Medicare 2010, Medicare 2011, Medicare 2012, Medicare 2013, Medicare 2014, Medicare 2015, Medicare 2016, Medicare 2017’:

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*Table 2: Medicare\_data*

Some of the main finding from these data sets are:

**Total population in the US from 2010 to 2017**

The purpose of this analysis is to investigate the total population trends in the United States over several years. Using census data, the population totals were grouped by year to identify changes and patterns in population growth. The results were visualized using a line chart, offering a clear representation of how the population has evolved over time.

The dataset used for this analysis contains population data from the U.S. Census, covering multiple years. The steps taken for the analysis are as follows:

Data Grouping: The data was grouped by year, and the total population for each year was calculated using the groupby() function.

Visualization: A line plot was created to display the total population for each year, with markers representing each year on the line.

Findings:

The plot clearly shows a steady increase in the U.S. population over the years. Each point on the graph represents the total population for a specific year.

The population growth appears to be gradual, with no sharp spikes or declines over the given time period, indicating consistent population growth.

The total population in the United States has been steadily growing over the analyzed period. This is consistent with historical population trends, driven by factors such as natural population growth (births exceeding deaths) and immigration. Understanding population trends is crucial for various policy decisions, including resource allocation, infrastructure development, and social services planning.

A graph with a line going up

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**Top ten States by Medicare Enrollment in 2010**

This report analyzes the top ten states with the highest Medicare enrollment in the United States for the year 2010. Medicare is a federal health insurance program that primarily serves individuals aged 65 and older, as well as certain younger people with disabilities. Understanding the distribution of Medicare enrollees by state provides insight into healthcare demands and resource allocation at both state and federal levels.

The analysis was performed using the new\_merged\_data dataset, which contains both population and Medicare data across different years. The following steps were taken:

Data Filtering: The dataset was filtered to include only records for the year 2010.

Top 10 States Selection: The nlargest() function was used to identify the top 10 states with the highest Medicare enrollment in 2010.

Visualization: A horizontal bar chart was created to visually represent the top 10 states by Medicare enrollment for that year.

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*Table 3: Top ten states by Medicare enrollment in 2010*

Key observations:

* The state with the highest Medicare enrollment in 2010 was California, with an enrollment figure of 4,747,000 people.
* The states at the top of the list, including Florida and Texas, have notably larger populations, which likely contributes to their higher Medicare enrollments.
* The chart shows a significant drop between the top few states and those ranked lower in the top 10, reflecting the varying levels of population across different states.
* The states with the highest Medicare enrollments tend to be those with larger populations and higher proportions of elderly residents. For example, states like Florida, Texas, and California often appear at the top of such lists due to their large elderly populations. These states may face higher healthcare demands, which could impact the allocation of Medicare funding and healthcare resources.

A graph of a number of states

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**The last ten states by Medicare Enrollment in 2010**

This report presents an analysis of the 10 states with the lowest Medicare enrollment in the United States for the year 2010. Medicare enrollment is an important metric, as it reflects the number of elderly or eligible individuals receiving healthcare coverage under the federal Medicare program. By identifying the states with the lowest enrollment, we can explore potential reasons for such low figures and the possible healthcare needs of these states.

The analysis was performed on the new\_merged\_data dataset, which contains population and Medicare data across various years. The specific focus is on the year 2010. The following steps outline the methodology used:

Data Filtering: The dataset was filtered to include only the records for the year 2010.

Lowest 10 States: The nsmallest() function was used to identify the 10 states with the lowest Medicare enrollments in 2010.

Visualization: A horizontal bar chart was created to display the bottom 10 states by Medicare enrollment for 2010, with the states ranked from lowest to highest.

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*Table 5: The least ten states in Medicare enrollment in 2010*

The analysis highlights the 10 states with the lowest Medicare enrollment in 2010, revealing significant variation in enrollment across different regions of the United States. Alaska and District of Columbia had the lowest enrollment numbers, while the gap between the lowest and the 10th state on the list is still substantial.

Understanding the factors behind these low enrollment figures could help policymakers and healthcare providers address potential disparities in access to healthcare resources in these states. Further research could explore how Medicare enrollment has changed in these states over time and how it compares to healthcare coverage trends at the national level.

A graph of a number of states

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**Comparison of Medicare Enrollment in 2010 and 2017 with changes over the years.**

This report presents a comparative analysis of the top 10 states with the highest Medicare enrollments for the years 2010 and 2017. Medicare, a critical federal healthcare program, is designed to provide health insurance to people aged 65 and older, as well as certain younger individuals with disabilities. The analysis highlights changes in Medicare enrollments over time and identifies trends in spending across states.

The analysis was conducted using a merged dataset containing population and Medicare data for both 2010 and 2017. The following steps outline the methodology:

Data Filtering: The dataset was filtered to include records from 2010 and 2017.

Top 10 States Selection: For both years, the top 10 states with the highest Medicare enrollments were identified using the nlargest() function.

Data Merging: The two dataframes containing the top 10 states for 2010 and 2017 were merged, allowing for a side-by-side comparison of Medicare enrollments in each state.

Visualization: A grouped bar chart was created to display Medicare enrollment in both years, along with a line plot to represent the change in Medicare enrollment from 2010 to 2017.

The green line in the chart above represents the change in Medicare enrollments between 2010 and 2017 for each state. This change provides valuable insights into the states where Medicare enrollment has increased or decreased the most over the seven-year period.

Significant Growth: Some states, such as California and Florida, experienced significant growth in Medicare enrollment, reflecting either an aging population or improvements in Medicare access.

Stable or Declining Enrollment: States like Ohio had relatively stable enrollments, with only minor changes between the two years.

Geographical Patterns: There may be regional differences contributing to the trends, with some regions showing higher increases in Medicare enrollments due to demographic shifts or state-specific policies related to healthcare.

The comparison of Medicare enrollments in 2010 and 2017 reveals significant variation across states in both absolute enrollment numbers and the rate of change over time. The analysis highlights states with the highest Medicare enrollments, such as Texas, and those with significant increases, such as California.

These trends may reflect demographic changes, such as an aging population in some states, or differences in state healthcare policies. Policymakers can use this information to better understand healthcare needs and resource allocation across states.

A graph of the number of states in the united states

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**Medicare Enrollment in the US per State**

This report provides a comparative analysis of Medicare enrollment by state for the years 2010 and 2017. Medicare, a vital healthcare program in the United States, supports millions of individuals over the age of 65 as well as certain younger individuals with disabilities. This analysis aims to illustrate how Medicare enrollments varied across states in these two years, providing insights into trends and potential regional differences.

The analysis was conducted using a merged dataset containing Medicare enrollment data from both 2010 and 2017 for each state. The following steps outline the methodology used:

Data Filtering: The dataset was filtered to select data from the specified years, 2010 and 2017, allowing for a direct comparison of Medicare enrollments per state.

Line Plot Visualization: Line plots were created to visualize Medicare enrollments per state in both 2010 and 2017. Each state’s enrollment is represented on the x-axis, while the y-axis displays the number of enrollees in thousands for both years.

The line plot comparison reveals distinct trends:

Rapid Growth in Enrollment: States like California, Florida, and Texas saw rapid growth in enrollments, which may reflect the states' growing elderly populations or healthcare expansion efforts.

Moderate or Minimal Changes: In contrast, smaller states such as Rhode Island and Montana experienced smaller or more gradual changes in Medicare enrollments.

Regional Differences

The differences in Medicare enrollment growth across states could be attributed to:

Population Aging: States with higher percentages of aging populations such as Florida naturally see more significant increases in enrollments.

State Healthcare Policies: Local policies and Medicare outreach programs may also influence the degree of growth in Medicare enrollments.

The analysis of Medicare enrollment data for **2010** and **2017** reveals substantial variability across states. Larger, more populous states, especially those with growing elderly populations, saw the greatest increases in enrollments, while smaller states experienced more stable trends.

These insights highlight the importance of understanding state-specific demographic shifts and healthcare policies when assessing future Medicare demands.

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**Top ten States by Medicare Enrollment in 2010, 2014 and 2017**

The purpose of this analysis is to compare the Medicare enrollment trends across the top 10 states in the years 2010, 2014, and 2016. By visualizing the Medicare enrollment for these years, we aim to identify patterns and changes in the enrollment numbers over time.

The dataset used contains Medicare enrollment data per state for the years 2010, 2014, and 2016. The code filters the data for each of these years and selects the top 10 states with the highest Medicare enrollment in each year.

Key steps in the analysis:

Filtering Data by Year: The dataset is filtered to extract data for the specific years (2010, 2014, and 2016).

Identifying Top 10 States: The nlargest() function is used to select the top 10 states by Medicare enrollment for each year.

Plotting the Data: A line chart is used to visualize Medicare enrollment for the top 10 states across the selected years. For each year, a line is plotted for each state showing its enrollment numbers.

Key Findings

State-Level Medicare Enrollment: The line plot for each year shows the top 10 states with the highest Medicare enrollments.

Enrollment patterns show variation from state to state, with some states consistently ranking high across multiple years.

Trend Over the Years: By plotting the data for three different years (2010, 2014, and 2016), the chart illustrates how Medicare enrollments have changed within the top 10 states over time.

Some states show steady growth, while others fluctuate in enrollment numbers across the three years.

Interpretation

Consistent States: States that consistently appear in the top 10 for all three years likely have large populations of eligible individuals for Medicare.

Year-on-Year Changes: The chart shows states with increasing or decreasing Medicare enrollments, which may indicate demographic shifts, changes in state healthcare policies, or other factors.

The visual comparison of Medicare enrollments in 2010, 2014, and 2016 highlights key states with high Medicare enrollments and reveals trends over time. This information can be useful for healthcare policymakers to assess the demand for Medicare services and plan resource allocation accordingly.

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