

**ALY6050**

**Tableau Application Assignment**



**Lecturer: Mohsen Soltanifar, PhD, AStat**

**Data Subject: A Look at Canadian National Health  
Expenditure 1975-2019**

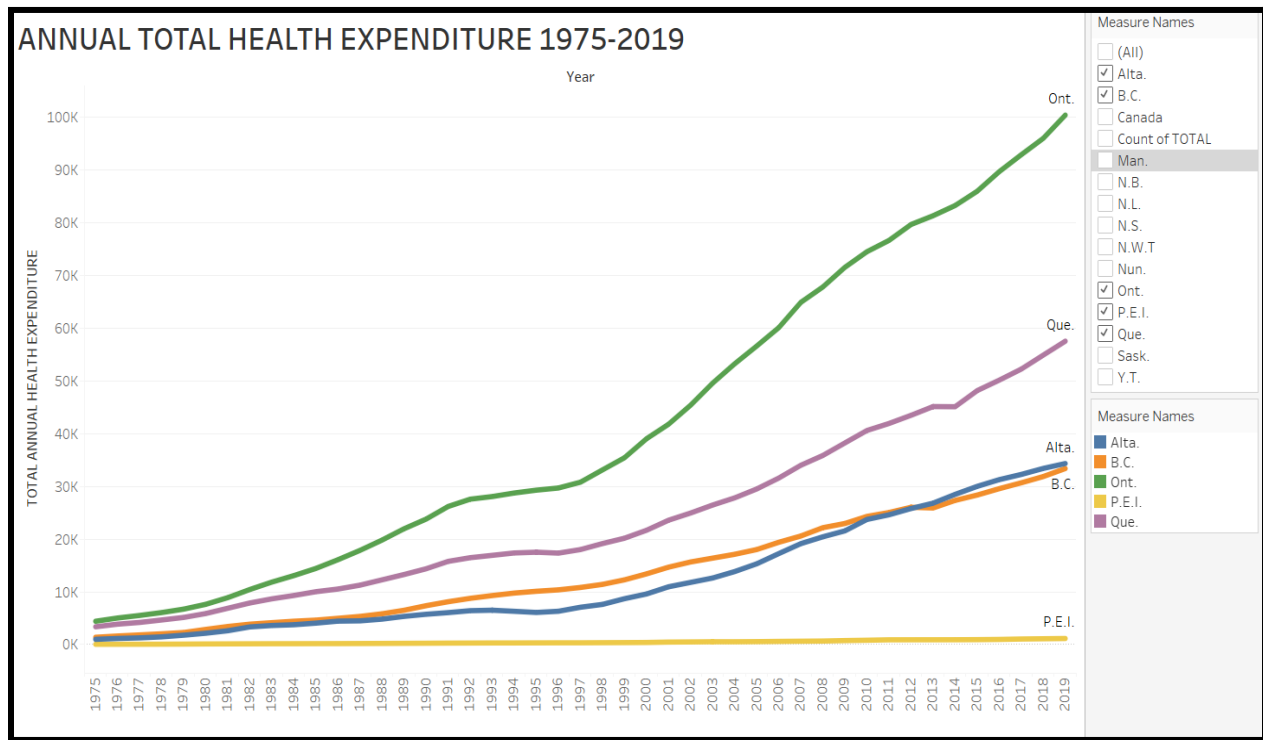
**Project Topic: Healthcare economy in Canada in different  
sectors for the period of 1975-2019.**

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## SECTION 1 - PLOT 1 ALL STATES

### Line Chart



#### Why did I choose the types of visualizations that you did?

The choice of line charts for representing the different provinces' annual health expenditure from 1975 to 2019 is suitable because line charts are commonly used to visualize trends and changes over time. Since the data spans a period of several years and involves multiple provinces, line charts can effectively show how the health expenditure of each province has evolved over time and allow for easy comparison between provinces.

#### How are the visualizations effective and address the gestalt and design principles discussed in the course?

- Proximity: Each province's line is placed near its corresponding name or legend, adhering to the principle of proximity, making it easier for viewers to understand the relationship between the lines and their respective provinces.

- Continuity: The smooth lines in the line charts represent the continuous nature of the data, allowing viewers to perceive the trends and patterns more easily, in line with the principle of continuity.

### **Design Principles:**

- Color and Contrast: Each province's line is depicted in a different color, ensuring clear differentiation between them and addressing the principle of color and contrast. This helps viewers identify and track individual provinces' expenditure trends.
- Labeling and Axes: The X-axis is labeled with years, and the Y-axis represents the total annual health expenditure scale. Clear labeling of the axes and inclusion of units of measurement help viewers understand the context of the data, adhering to the principle of labeling and axes.

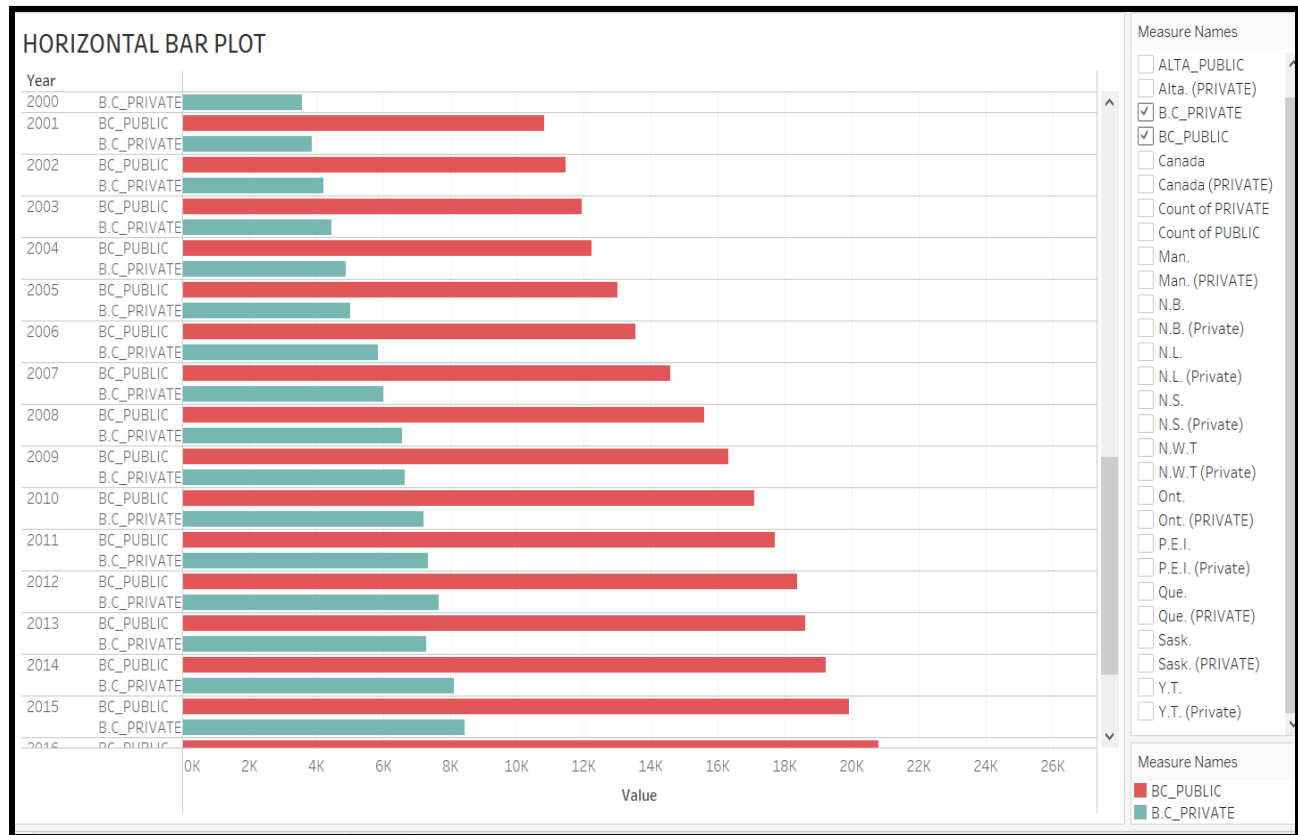
### **How do the visualizations answer the research/business question?**

The line charts address the research/business question by providing insights into the annual health expenditure of different provinces in Canada from 1975 to 2019. The visualizations allow for the following analyses:

- Trend Analysis: By observing the lines for each province, researchers or businesses can identify overall trends in health expenditure.
- Comparison: The line charts enable a visual comparison between provinces. Viewers can analyze the relative positions, slopes, and patterns of the lines to understand how the health expenditure of different provinces compares to each other.
- Outlier Detection: Unusual or anomalous behavior in the line charts, such as sharp spikes or sudden drops, may indicate outliers or noteworthy events. Researchers or businesses can investigate these outliers to gain insights into specific provinces' health expenditure patterns.
- Long-term Changes: By examining the overall direction of the lines, viewers can assess the long-term changes in health expenditure for each province. This information can be useful for understanding the evolving healthcare landscape and making informed decisions based on historical patterns.

## SECTION 2 - PLOT 2 ALL STATES

### Horizontal Bar chart



#### Why did I choose the types of visualizations that you did?

The choice of a horizontal bar chart for representing public and private health expenditure for different provinces of Canada from 1975 to 2019 seems appropriate for several reasons.

- **Comparison:** Horizontal bar charts are well-suited for comparing values across different categories or groups. In this case, the chart allows for easy comparison of public and private health expenditures for different provinces, facilitating insights into the relative contributions of each sector.
- **Data Representation:** The use of bars allows for a clear representation of the values for each category (public and private expenditure) and province, making it easier for viewers to understand and interpret the data.
- **Interactive Elements:** The availability of filter options to select specific states for comparison adds interactivity to the chart, enabling users to customize their analysis and focus on specific provinces or comparisons of interest.

**How are the visualizations effective and address the gestalt and design principles discussed in the course?**

**The visualizations are effective in addressing gestalt and design principles in the following ways:**

- **Proximity:** The bars representing the values of public and private health expenditure for each province are placed in close proximity to the respective province names, adhering to the principle of proximity. This allows viewers to quickly associate each bar with its corresponding province.
- **Visual Hierarchy:** The horizontal orientation of the chart aligns with the natural reading order for most languages (left to right), making it easy for viewers to scan and compare the values across provinces.

**Design Principles:**

- **Color and Contrast:** The use of different colors for public and private expenditures helps distinguish between the two categories. Additionally, contrasting colors can be used for the bars of different provinces, aiding differentiation and enhancing the visual appeal.
- **Data Labels:** Including labels on or near the bars with the values of public and private health expenditure for each province ensures clarity and helps viewers understand the specific values being represented.

**How do the visualizations answer the research/business question?**

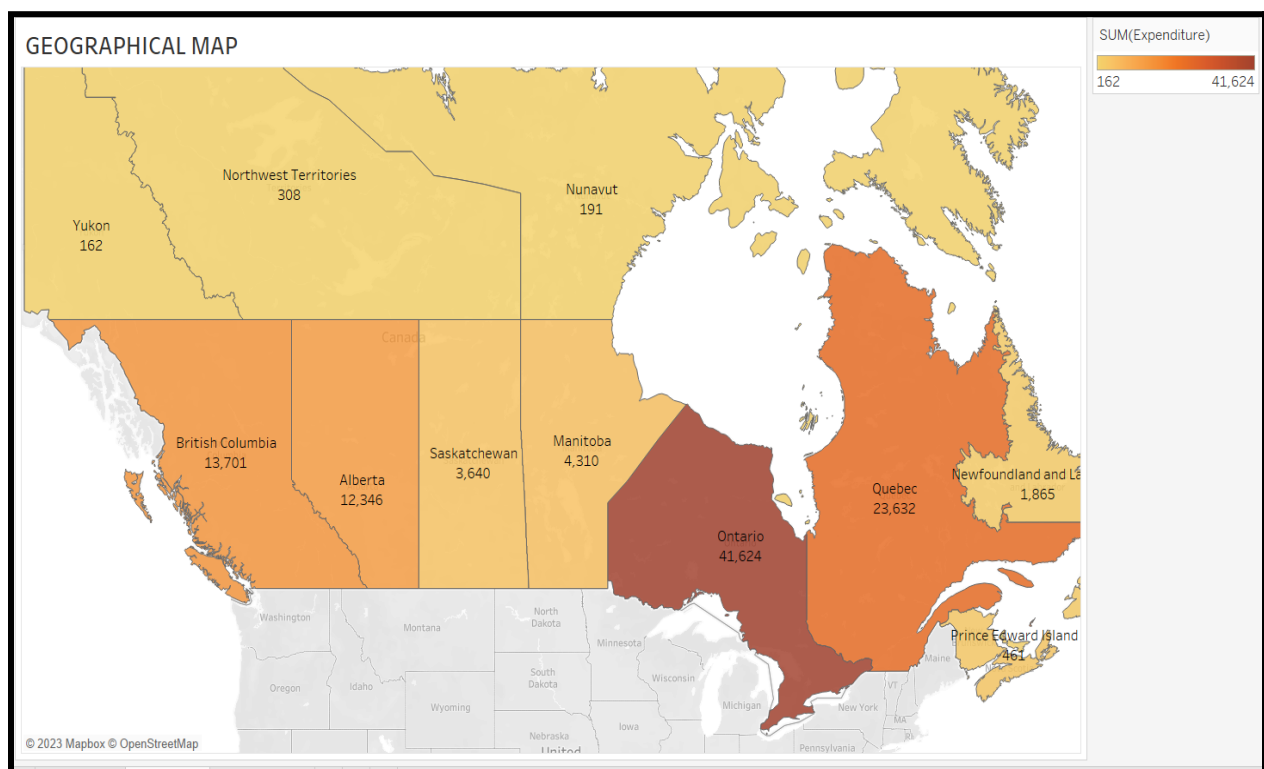
The interactive horizontal bar chart provides insights into the public and private health expenditure for different provinces of Canada from 1975 to 2019, addressing the research/business question. The visualizations allow for the following analyses:

- **Sector Comparison:** By comparing the lengths of the bars representing public and private health expenditures for each province, researchers or businesses can understand the relative proportions and contributions of each sector. This information can help assess the role of public and private funding in healthcare across provinces.
- **Provincial Comparison:** Users can select specific provinces using the filter option to compare the public and private health expenditures between different provinces. This allows for a deeper understanding of the variations in healthcare funding across provinces and facilitates comparisons based on specific research or business interests.

- **Historical Analysis:** By examining the values of public and private health expenditure over time, viewers can analyze trends and patterns within and across provinces. This information can be useful for understanding the changes in healthcare spending and identifying provinces that have experienced significant shifts in funding sources over the years.

Overall, the interactive horizontal bar chart provides a comprehensive and customizable view of public and private health expenditures for different provinces of Canada, enabling researchers and businesses to gain valuable insights into the healthcare landscape and make informed decisions based on the data.

## SECTION 3 - GEOGRAPHIC MAPS



### Why did you choose the types of visualizations that you did?

The choice of a geographical chart for representing the total Canadian health expenditure for different provinces of Canada seems appropriate for several reasons:

- **Geographic Representation:** A geographical chart allows for a visual representation of the data across different provinces on a map, providing a spatial context that can be easily understood.

- **Color Mapping:** The use of different colors or shades to represent the total health expenditure for each province allows for quick visual comparison and identification of provinces with varying levels of expenditure.
- **Highlighting Top Provinces:** By highlighting Ontario, Newfoundland, and British Columbia as the top three provinces with the highest health expenditure, the chart provides a clear emphasis on the provinces of interest.

## How are the visualizations effective and address the gestalt and design principles discussed in the course?

The visualizations are effective in addressing gestalt and design principles in the following ways:

- **Color and Contrast:** The use of different colors or shades to represent the total health expenditure addresses the principle of color and contrast. The color mapping allows viewers to distinguish between provinces based on their expenditure levels, with lighter colors representing lower expenditures and darker colors representing higher expenditures.
- **Visual Hierarchy:** By highlighting Ontario, Newfoundland, and British Columbia as the top three provinces with the highest health expenditure, the chart establishes a visual hierarchy, drawing viewers' attention to these provinces. **This adheres to the gestalt principle of visual hierarchy.**
- **Geographic Proximity:** **The chart's representation of provinces on a map adheres to the gestalt principle of proximity.** Provinces that are physically close to each other on the map are visually grouped together, making it easier for viewers to compare neighboring provinces' health expenditure levels.

## How do the visualizations answer the research/business question?

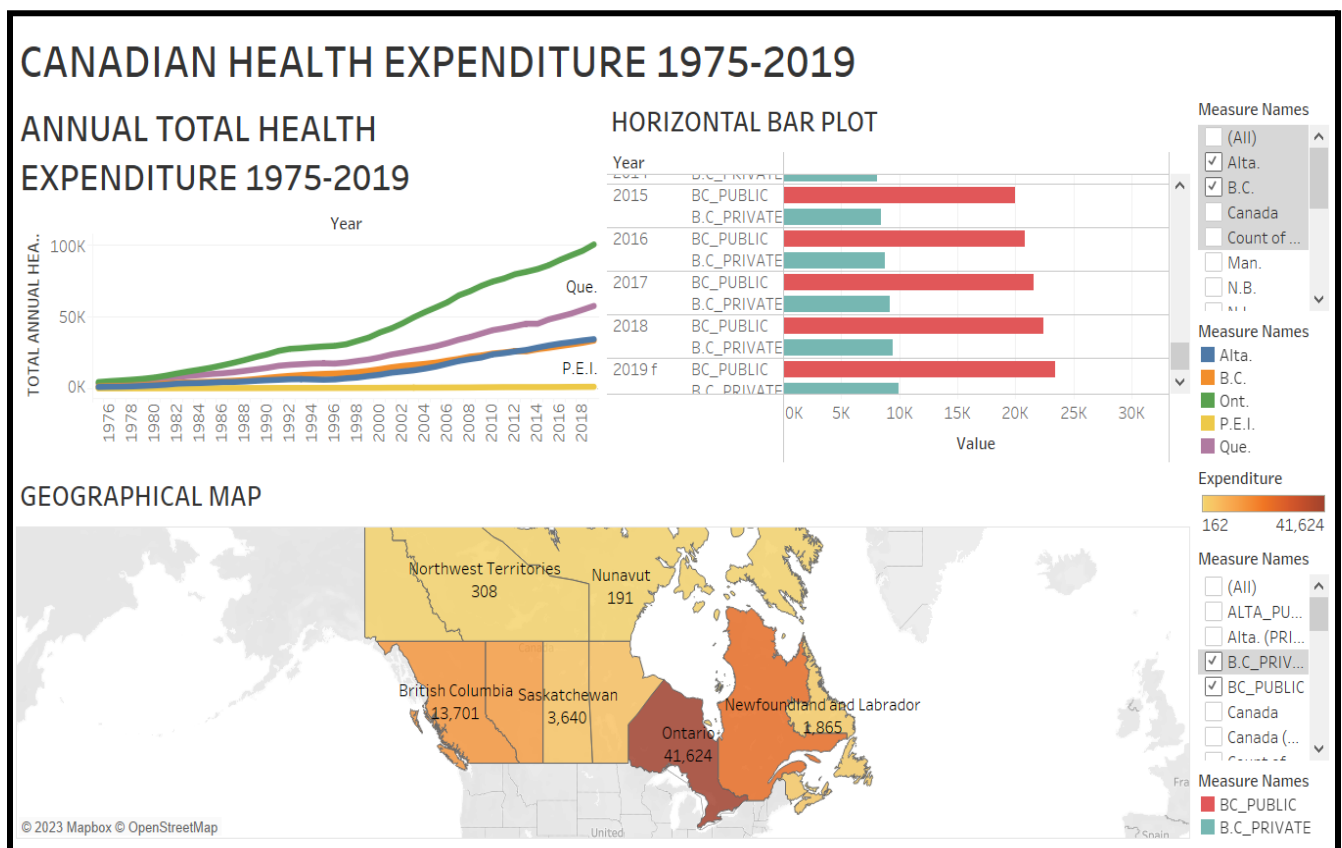
The geographical chart provides insights into the total Canadian health expenditure for different provinces of Canada, answering the research/business question. The visualizations allow for the following analyses:

- **Regional Comparison:** By examining the colors or shades of different provinces, viewers can compare the total health expenditure levels across regions. They can identify provinces with higher or lower health expenditure based on the color intensity, facilitating regional comparisons.

- **Top Provinces:** The chart specifically highlights Ontario, Newfoundland, and British Columbia as the top three provinces with the highest health expenditure. This information helps answer the question of which provinces have the highest healthcare spending and provides a quick overview of the top performers.
- **Spatial Analysis:** By visually representing the provinces on a map, the chart allows for spatial analysis. Researchers or businesses can observe patterns or clusters of provinces with similar or contrasting health expenditure levels, aiding in the understanding of geographical disparities in healthcare funding.

Overall, the geographical chart effectively presents the total Canadian health expenditure for different provinces, enabling researchers and businesses to gain insights into regional variations, identify top-performing provinces, and analyze spatial patterns in healthcare expenditure.

## What story do the above visualizations section tell us in common?





## Dashboard Publish Link

<https://prod-ca-a.online.tableau.com/#/site/shreyanshtableau/workbooks/106507/views>

The combination of the three visualizations tells a comprehensive story about the Canadian health expenditure for different provinces from 1975 to 2019. Here's the story that emerges from the visualizations:

The line charts in Section 1 showcase the annual health expenditure trends for each province over time. Viewers can observe how the health expenditure of each province has evolved, identify long-term patterns, and compare the expenditure trajectories between provinces. This provides an understanding of how healthcare spending has changed over the years.

In Section 2, the horizontal bar chart presents a comparison of public and private health expenditure across provinces. By examining the lengths of the bars, viewers can assess the relative contributions of each sector and identify provinces where one sector dominates over the other. The interactivity of the chart allows for personalized analysis by selecting specific provinces of interest.

The geographic maps in Section 3 provide a spatial perspective of the total health expenditure across provinces. The use of color mapping enables viewers to quickly identify provinces with varying expenditure levels. By highlighting Ontario, Newfoundland, and British Columbia as the top three provinces with the highest health expenditure, the maps emphasize the provinces of particular interest.

Combining these visualizations, the story that emerges is one of a dynamic and diverse healthcare landscape in Canada. The line charts show the temporal changes, the horizontal bar chart provides insights into the sectoral distribution, and the geographic maps offer a spatial understanding of health expenditure across provinces. This holistic narrative allows researchers and businesses to analyze trends, make regional comparisons, identify top-performing provinces, and gain a comprehensive overview of the Canadian healthcare system.

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