**Project Title: HCAHPS Survey Results Analysis**

**Project Description:**

The project required taking on the role of a Data Analyst representing the American Hospital Association (AHA). In this capacity, the main objective was to analyze data from nine years of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) surveys.

The goal was to understand patients' perspectives on hospital care and identify opportunities for improving quality. Throughout the challenge, the project involved thoroughly examining trends in HCAHPS scores, recognizing strong points, pinpointing opportunities for improvement and developing practical recommendations for hospitals to enhance the overall patient experience.

The following steps were undertaken to achieve this goal:

**The project steps included:**

1. **Data Acquisition:** The initial step involved downloading the dataset from Maven Analytics website followed by an initial exploration in MS Excel.
2. **Data Connection**: A connection was established to the data file within Microsoft Power BI, enabling an access and integration of the dataset.
3. **Exploratory Data Analysis**: Applied Exploratory Data Analysis techniques in the Query Editor to gain insights into the data quality and structure.
4. **Data Cleaning:** Ensured data integrity by cleaning, addressing inconsistencies and handling mixed data (numerical and categorical).
5. **Data Modeling:** Within the Data Model, created meaningful relationships between dimension tables (Reports, Survey Measures, States, Questions) and fact tables (National Results, State Results, Responses), resulting in an interactive analytical environment.
6. **Comprehensive Analysis**:Employed Data Analysis Expressions (DAX) measures to generate new data insights and enhance analytical capabilities.
7. **Detailed Report:** Concluded the project with a multi-tab report, including "Overview", "National Results", "State Results I" and "State Results II" offering specialized perspectives on HCAHPS Survey Results and valuable insights.

**Terminology employed in the project:**

* **Top Box %:** Percentage of Positive Responses
* **Middle Box %:** Percentage of Neutral Responses
* **Bottom Box %:** Percentage of Negative Responses

**Key findings from the data analysis are as follows:**

**Participation and Response Rates:**

Over a span of 9 releases, the project involved 4,799 hospitals and collected around 23.4 million completed surveys. The average response rate across all years was 26.6%. However, it's important to note that the average response rate has been declining over the past 9 years, dropping from 30.8% in 2015 to 22.7% in 2023.

**Response Rates by State:**

Response rates varied significantly by state. Nebraska had the highest average response rate

at 36.3%, while the District of Columbia had the lowest at 20.6%. The top-performing states in terms of response rate included Nebraska, Wisconsin, Minnesota, Iowa, North Dakota, South Dakota and Kansas. Conversely, the lowest response rates were observed in the District of Columbia, New Mexico, Georgia, New Jersey, Alaska, Maryland and Nevada.

**National and State-Level Sentiment Overview:**

**At the national level**, the average Top Box % stands at 71.4% over nine years, with Middle Box % at 20.2% and Bottom Box % at 8.4%. The most recent data reveals a slight decline in Top Box % to 69.4% compared to the previous period at 70.7%. The Bottom Box % has increased by 4.35% from 9.2% to 9.6%. Notably, Top Box % had been steadily increasing since 2015 but saw a significant drop in 2021, reaching its lowest point in 2023. Bottom Box % showed minor drops in 2017, 2018 and 2021 but started rising in 2022, continuing into 2023.

**On the state level**, the nine-year average Top Box % is 71.3%, Middle Box % is 20.3% and Bottom Box % is 8.4%. Similar to the national trend, the latest data shows a slight decline in Top Box % to 69.4% from 70.6%. The Bottom Box % increased by 5.66% from 9.1% to 9.6%. Like the national level, Top Box % had been consistently rising since 2015 but experienced a decline in 2021, reaching its lowest point in 2023. Bottom Box % showed small drops in 2017, 2018 and 2021 but began to rise in 2022 and continued into 2023.

**A Closer Look at Key Measures:**

Upon conducting an in-depth analysis, several significant trends have emerged across all 10 measures. Notably, Top Box % has decreased while Bottom Box % has shown an increasing trend since 2021, based on 2020 year data. The most substantial shifts have been observed in the domains of **Cleanliness of Hospital Environment**, **Communication about Medicine** and **Responsiveness of Hospital Staff**, both at the national and state levels.

**Cleanliness of Hospital Environment:**

**National Level:**

* The Top Box % reached its peak at 76% in 2021 but declined to 72% in 2023.
* Simultaneously, the Bottom Box % displayed a noteworthy increase, climbing from 7% in 2021 to 10% in 2023.

**State Level:**

* Similar to the national trend, the Top Box % at the state level reached its zenith at 75.6% in 2021 but dipped to 71.7% in 2023.
* In parallel, the Bottom Box % exhibited a comparable increase, rising from 7.5% in 2021 to 9.8% in 2023.

**Communication about Medicine:**

**National Level:**

* The Top Box % experienced growth, peaking at 66% in 2021, but subsequently declined to 61% in 2023.
* Conversely, the Bottom Box % increased from 17% in the period spanning 2017-2021 to 20% in the years 2022-2023.

**State Level:**

* At the state level, the Top Box % mirrored the national pattern, reaching its highest point at 66.1% in 2021 but decreasing to 61.5% in 2023.
* Similarly, the Bottom Box % exhibited a parallel increase, ascending from 16.7% in 2021 to 20% in 2022-2023.

**Responsiveness of Hospital Staff:**

**National Level:**

* Top Box % experienced a significant decrease, falling from 70% to 65% between 2021 and 2023.
* In contrast, the Bottom Box % increased from 8% in 2021 to 10% and 11% in subsequent years.

**State Level:**

* On the state level, Top Box % followed a similar trajectory, decreasing from 70.4% to 65.5% between 2021 and 2023.
* The Bottom Box % concurrently increased from 8.1% in 2021 to 9.9% and 10.4% in subsequent years.

For the remaining measures, namely **Care Transition**, **Communication with Doctors**, **Communication with Nurses**, **Discharge Information**, **Overall Hospital Rating** and **Willingness to Recommend the Hospital**, Top Box % declined to a lesser extent, with a minor rise in Bottom Box % observed both at the national and state levels.

In the realm of **Quietness of Hospital Environment**, Top Box % and Bottom Box % remained relatively stable, showcasing minimal fluctuations at both the national and state levels.

**Throughout the various states:**

**Communication about Medicines:** Across states, the highest Top Box % were observed in South Dakota, Louisiana, Maine, Wyoming, Wisconsin and Nebraska. In contrast, the highest Bottom Box % were recorded in the District of Columbia, New Jersey, Maryland, New York, Florida, Nevada and California.

**Cleanliness of Hospital Environment:** States with the highest Top Box % in this category included Nebraska, Iowa, Wisconsin, Idaho and South Dakota. Conversely, the highest Bottom Box % were found in the District of Columbia, Maryland, Florida, Nevada, Arizona and New Jersey.

**Responsiveness of Hospital Staff:** High-performing states for this measure included South Dakota, Nebraska, Minnesota, Wyoming and North Dakota. On the other hand, the highest Bottom Box % were registered in the District of Columbia, Maryland, New Jersey, New York, Florida, California and Nevada.

**Conclusion:** The findings underscore the need for hospitals to take proactive steps in addressing these concerns. Several key takeaways emerge:

1. **Encouraging Patient Participation:** Hospitals must actively encourage patient participation in surveys, as the Average Response Rate has declined in recent years. It is imperative to understand patient perspectives and experiences to drive improvements.
2. **Focusing on Low-Performing Areas:** Attention should be particularly directed towards regions with lower performance. The District of Columbia stands out as a concern with not only the lowest Response Rate but also the highest Bottom Box % across the three key measures. This indicates a loss of patient interest in survey participation, possibly due to a perceived lack of improvement in healthcare quality over time.
3. **Addressing Specific Issues:** Hospitals should prioritize addressing issues related to Communication about Medicines, Cleanliness of Hospital Environment and Responsiveness of Hospital Staff. These aspects are pivotal in patient satisfaction and overall quality of care.
4. **Targeted Improvement in Challenging States:** Special attention is needed in states like the District of Columbia, New Jersey, Maryland, New York, Florida, Nevada and California, where multiple areas of healthcare quality exhibit lower performance.

In conclusion, healthcare facilities should take a holistic approach to improve patient experiences and the quality of care. By focusing on these key measures and regions, hospitals can work towards enhancing patient satisfaction and ensuring that healthcare services consistently meet or exceed expectations.