



About the Project

The intent of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) initiative is to provide a standardized survey instrument for measuring patients' perspectives on hospital care, and one of its main goals is to "create incentives for hospitals to improve their quality of care". In this analysis, I analyzed the results of the survey over the 9 years it took place (2014-2022) to understand the health care issues and trends and provided recommendations to hospitals nationwide on how to improve the patient experience.

Table of Contents:

1. About the Dataset
 - a. Background
 - b. Business Questions for the Dataset
2. Key Insights
 - a. Tools Used for Analysis
3. Detailed Analysis
 - a. Data Quality
 - b. Data Analysis (Answer Business Questions for the Dataset)

Links:

[Tableau Dashboard](#)

About the Dataset

Background

The dataset was acquired from Maven Analytics but the dataset is from the Centers for Medicare & Medicaid Services (CMS) and can be found [here](#). The dataset provides data on survey response rate(%) per hospital, measure ids, survey year, state of hospital, region, top-box percentage, middle-box percentage, and bottom-box percentage.

Business Questions for the Dataset

1. Have hospitals' HCAHPS scores improved over the past 9 years?
 2. Are there any specific areas where hospitals have made more progress than others?
 3. Are there any major areas of opportunity remaining?
 4. What recommendations can you make to hospitals to help them further improve the patient experience?
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Key Insights

1. On average, hospitals nationwide have seen a 2.82% decrease in all measures from 2014 to 2022. The response rate (%) has dropped nationally, as well, by 25.81% from 2014 to 2022.
2. Hospitals' strongest area of care was providing accurate and helpful discharge information for patients. Communication with doctors and nurses remained one of the hospitals' basis for premier care by displaying top box score averages of 80% and above, on average over the 9 years, for all the measures listed: Discharge Information, Communication with Doctors, and Communication with Nurses. The West North Central region embodies this progress and has shown consistent success in these areas of patient care through 2014-2022. They consistently had the highest response rate with an average of 33% over the 9 year survey period. The best performing state was South Dakota with all measures, except care transition, consistently displaying 70% top box averages and above between 2014-2022. Nebraska had the highest response rate average over the duration of the 9 year survey at 36% with 85 hospitals in the state.
3. Responsiveness of Hospital Staff, Communication about Medicines, Quietness of Hospital Environment, and Care transition measures showed consistent low top box averages nationwide over the last 9 years. Their average top box percentage for these measures were all 70% and below. Care transition fell as low as 51% nationwide in 2022. Nationwide, communication about medicines was the measure with the largest drop, 6.15%, in top box average from 2014 to 2022. Care transition averaged the lowest top box score of 51%-54% for all 9 years. The worst performing state was the District of Columbia(DC) with 7 measures falling below a 65% top box average for all 9 years. DC also had the worst response rate by state and reached an all-time low nationally in 2023 with a 14% response rate. A factor to consider is the state only has 7 hospitals.

4. To improve responsiveness of hospital staff, hospitals should implement staff training, efficient communication systems, and feedback mechanisms to ensure timely responses to patient needs and concerns.

For communication about medicines, hospitals should enhance patient experiences by providing comprehensive medication education, clear written instructions, and follow-up support to address medication-related queries.

To improve the quietness of hospital environments, hospitals should improve patient rest and recovery by implementing noise-reduction strategies and offering amenities for a quieter environment.

Lastly for care transition, hospitals should enhance care transitions through comprehensive discharge planning, medication reconciliation, and effective communication with primary care providers for seamless post-hospital care.

Tools Used for Analysis & Dashboard Design

1. Utilized excel functions(SUM, YEAR,TEXT,ISBLANK,COUNTIF) to clean, confirm accuracy of data, and extract data for analysis.
2. Tableau tables, charts, and graphs used in parallel with color, highlighting, and sizing to show greatest intensity of data.
3. Used Figma to graphically design dashboard color scheme. The icons in my dashboard were taken from Flaticon.

Detailed Analysis

Data Quality

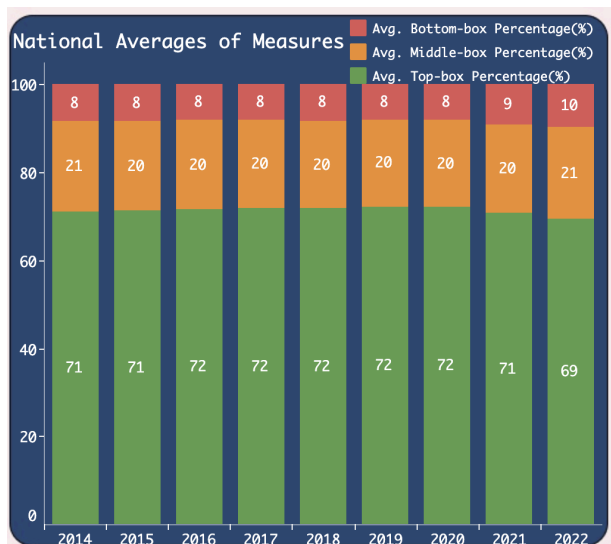
I downloaded all the csv files from Maven Analytics and read through the data dictionary csv file to break down and analyze the data contained in each file. Afterwards, I used Excel to perform quality checks for null values, duplicates, data types, and accurate percentage totals. I deleted null values from the survey responses csv file because the percentage of missing values was relatively small compared to the total dataset and imputation was not appropriate. The data set was identified as clean and able to be used for analysis after these checks and changes. I uploaded all the cleaned csv files to Tableau for analysis.

Data Analysis

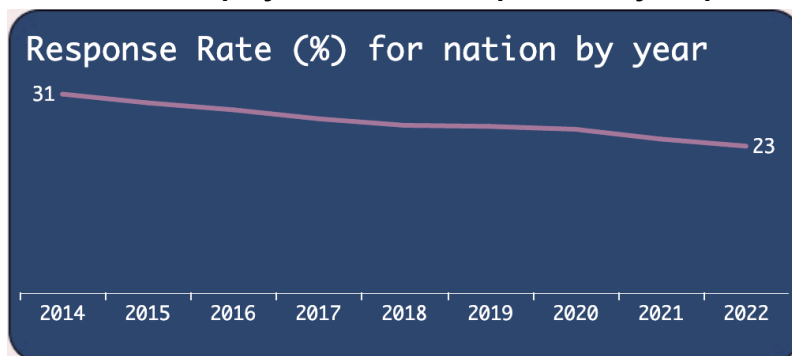
1. Have hospitals' HCAHPS scores improved over the past 9 years?

To begin analysis on how hospitals' HCAHPS scores have changed over the past 9 years, I chose the average top-box answers percentage as the metric to capture this change. In the survey, top-box answers represented positive responses equal to "Always" or "Strongly Agree." Middle-box answers indicated mild or neutral responses like "Usually" or "Agree". Bottom-box answers held negative responses, such as, "Sometimes or Never" or "Disagree or Strongly Disagree." The National Averages of Measures stacked bar graph on the national level tab of the dashboard displays the average top-box, middle-box, and bottom-box percentages by year for all hospitals. In

2014, hospitals had an average 71% top-box percentage but, in the final year of the survey, 2022, the top-box percentage dropped to 69%. **This was a 2.82% decrease nationwide in the patient experience while at hospitals.**



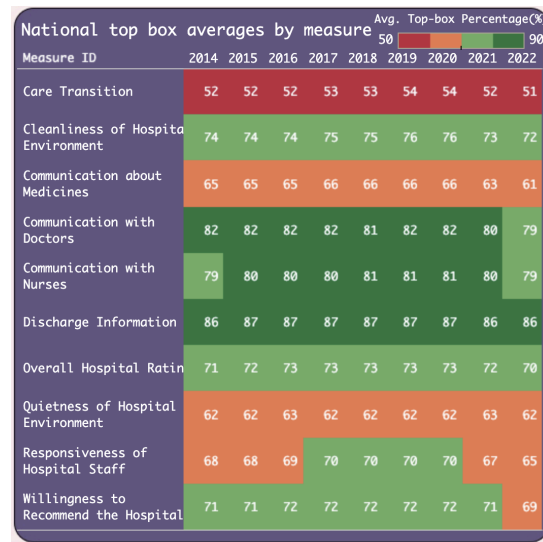
Another factor used to decipher the patient experience through HCAHPS scores was to plot the survey response rate(%) over the 9 years the survey took place. In 2014, the average response rate was 31% and by the last year of the survey, 2022, it had dropped to 23%. **This displays a national drop in survey response rate of 25.81%.**



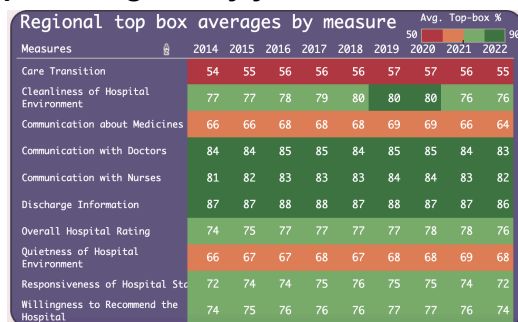
2. Are there any specific areas where hospitals have made more progress than others?

I wanted to get an overview of all measures included in the survey through the 9 year duration of the survey. I accomplished this by creating a table that visualizes each measure and its average top-box national percentage for all hospitals per year. I set a top-box benchmark of 70%-80% and I highlighted measures that met this standard, light green. Measures that exceeded this benchmark in the range of 80% and above were shaded dark green. Measures below the benchmark were either highlighted orange (60-69%) or red(50-59%). This visualization displays only one measure that was highlighted dark green for every year of the survey. **Nationwide, it is obvious that hospitals' best indicator of creating a pleasant patient experience was in the discharge information they provided patients as they left the hospital.** Secondary in performance were hospitals' great communication through their doctors and nurses.

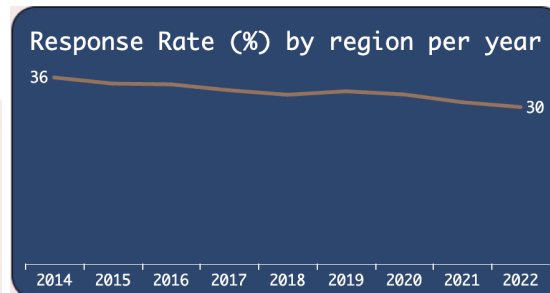
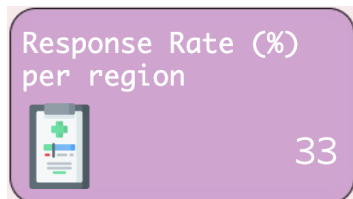
Both these measures touted average top-box percentages above 80% for the majority of the survey duration.



The next step I took to understanding the successes of hospitals was to view how hospitals performed at the regional level to analyze if there were certain regions who performed better and could provide insight to struggling regions. After analyzing each region, the West North Central region had the highest number of measures reaching the benchmark of 70% top-box percentage every year. **The West North Central region had 7 out of the 10 measures reach this benchmark for every year. 3 of those 7 measures exceeded the benchmark and stayed above an 80% average top-box percentage every year.**



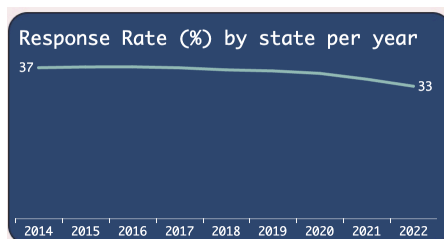
In addition to finding the region with the best performance in measures, I wanted to discover the region with the highest survey response rate (%) per year. I used the same line graph format from the national level tab to visualize survey response rate on the regional level. **The West North Central region consistently had the highest response rate with an average of 33% over the 9 year survey period.**



After examining on a regional level, I wanted to go further and examine the best performing state metric wise. I used the same type of visualizations, highlighted table and line graph, in regards to state top-box averages by measure and survey response rate. **According to the survey, South Dakota(SD) provided the best patient experience by consistently displaying 70% average top-box percentages and above between 2014-2022 for all measures, except Care Transition.**

State top-box averages by measure										Avg. Top-box %		
Measures	2014	2015	2016	2017	2018	2019	2020	2021	2022	90		
Care Transition	55	54	56	56	56	59	59	58	56			
Cleanliness of Hospital Environment	76	78	80	79	81	81	80	77	77			
Communication about Medicines	69	69	70	70	71	72	72	67	67			
Communication with Doctors	84	86	86	86	83	86	87	87	85			
Communication with Nurses	82	83	85	84	83	85	85	85	84			
Discharge Information	88	88	90	89	87	87	87	88	87			
Overall Hospital Rating	75	78	79	79	77	80	81	80	78			
Quietness of Hospital Environment	71	70	72	72	69	72	71	72	70			
Responsiveness of Hospital Staff	74	77	78	78	80	79	80	78	76			
Willingness to Recommend the Hospital	76	77	79	78	77	81	82	79	76			

Nebraska(NE) was the state with the highest response rate(%) average over the duration of the 9 year survey at 36% with 85 hospitals in the state.



3. Are there any major areas of opportunity remaining?

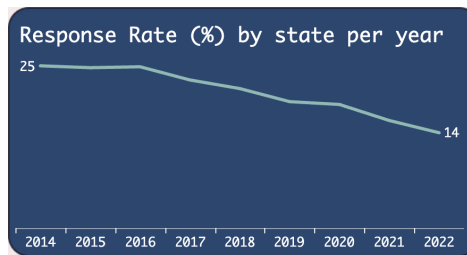
To start analyzing and visualizing the major areas of concern and opportunity for hospitals' nationwide, I viewed the national top-box averages by measure. 4 of the 10 measures were the worst-rated part of the hospital experience by patients and all fell below the benchmark of a top-box percentage of 70%. **Responsiveness of Hospital Staff, Communication about Medicines, and Quietness of Hospital Environment measures showed persistent low top-box averages nationwide from 2014-2022. These 3 measures averaged top-box percentages between 60-69%. Communication about Medicines was the measure with the largest drop, 6.15%, in**

top box average from 2014 to 2022. The fourth and worst performing measure nationwide was Care Transition. This measure averaged the lowest top-box score between the red highlighted range of 50%-59% for all 9 years and fell to an all-time low in 2022 with 51% average top-box percentage.

Measure ID	2014	2015	2016	2017	2018	2019	2020	2021	2022
Care Transition	52	52	52	53	53	54	54	52	51
Cleanliness of Hospital Environment	74	74	74	75	75	76	76	73	72
Communication about Medicines	65	65	65	66	66	66	66	63	61
Communication with Doctors	82	82	82	82	81	82	82	80	79
Communication with Nurses	79	80	80	80	81	81	81	80	79
Discharge Information	86	87	87	87	87	87	87	86	86
Overall Hospital Rating	71	72	73	73	73	73	73	72	70
Quietness of Hospital Environment	62	62	63	62	62	62	62	63	62
Responsiveness of Hospital Staff	68	68	69	70	70	70	70	67	65
Willingness to Recommend the Hospital	71	71	72	72	72	72	72	71	69

The worst performing state was the District of Columbia(DC) with 7 measures averaging a top-box percentage below 65% for the entire 9 year duration of the survey. DC also had the worst survey response rate(%) by state and reached an all-time national low in 2023 with a 14% response rate. A factor to consider in its poor performance was the state only has 7 hospitals.

Measures	2014	2015	2016	2017	2018	2019	2020	2021	2022
Care Transition	42	42	43	44	45	46	47	48	45
Cleanliness of Hospital Environment	63	61	61	64	65	65	67	65	63
Communication about Medicines	57	55	56	58	58	59	59	58	53
Communication with Doctors	77	77	77	76	76	76	77	78	78
Communication with Nurses	70	70	71	71	70	70	71	71	70
Discharge Information	79	81	82	82	83	83	84	84	82
Overall Hospital Rating	58	58	58	62	61	61	62	63	59
Quietness of Hospital Environment	54	54	53	56	55	56	56	57	54
Responsiveness of Hospital Staff	54	52	53	52	54	55	57	53	48
Willingness to Recommend the Hospital	61	60	60	63	61	61	62	62	59



4. What recommendations can you make to hospitals to help them further improve the patient experience?

Improving the patient experience is essential for hospitals to provide high-quality healthcare services and ensure patient satisfaction. Here are my recommendations for hospitals to enhance the patient experience in the lowest performing measures nationwide:

Responsiveness of Hospital Staff:

- **Training and Empowerment:** Ensure that hospital staff, including nurses, doctors, and administrative personnel, are trained in customer service skills and effective communication. Empower them to address patient needs promptly.
- **Clear Communication Channels:** Implement efficient communication systems, such as call buttons or electronic communication platforms, that allow patients to easily contact staff when assistance is needed.
- **Feedback Loop:** Establish a feedback mechanism where patients can provide real-time feedback on their experience, enabling staff to address concerns and recognize exceptional service promptly.

Communication about Medicines:

- **Education and Counseling:** Provide thorough medication education to patients and their families, explaining dosage, timing, potential side effects, and interactions.

Encourage open dialogue about any concerns.

- **Written Materials:** Offer clear written instructions and information about prescribed medications, including any potential complications or allergic reactions.

- **Follow-Up:** Schedule follow-up appointments or calls to ensure patients understand and are adhering to their medication regimen. Address any questions or issues that arise.

Quietness of Hospital Environment:

- **Noise Reduction Initiatives:** Implement noise-reduction strategies such as using sound-absorbing materials, providing white noise machines, and restricting noisy activities during certain hours.

- **Staff Training:** Train hospital staff to be mindful of noise levels and the impact of noise on patient recovery and rest. Encourage quiet behavior in patient areas.

- **Patient Comfort:** Provide amenities such as noise-canceling headphones, earplugs, and privacy curtains to help patients create a quieter and more comfortable environment.

Care Transition:

- **Comprehensive Discharge Planning:** Ensure that discharge planning begins early and involves the patient, family, and all relevant healthcare providers. Provide a clear written plan for post-hospital care.

- **Medication Reconciliation:** Verify the accuracy of a patient's medications upon admission, during the hospital stay, and at discharge to prevent errors during care transitions.

- **Communication with Primary Care Providers:** Maintain open communication with the patient's primary care provider to ensure a smooth transition, sharing necessary medical records and updates.

General Recommendations:

- **Patient-Centered Approach:** Always prioritize the patient's needs, preferences, and concerns in all interactions and decisions.

- **Continuous Improvement:** Regularly gather feedback from patients through surveys, focus groups, or one-on-one conversations to identify areas for improvement.

- **Employee Engagement:** Engage and motivate hospital staff by recognizing their contributions and providing opportunities for professional development.

- **Technology Integration:** Leverage technology to streamline communication, appointment scheduling, and educational resources for patients.

In addition, each hospital's approach should be tailored to its unique patient population, resources, and challenges. Hospitals should have a method in place to assess progress and adapt strategies as needed to ensure ongoing improvement in the patient experience.

Thank you so much for reading my comprehensive analysis of the HCAHPS Patient Survey Data and I hope you enjoyed it and learned something along the way.

Please feel free to check out my portfolio and more [Tableau dashboards!](#)