

HCAPS REPORT

INTRODUCTION

Dataset Description:

The HCAHPS (**Hospital Consumer Assessment of Healthcare Providers and Systems**) dataset contains information collected from patient surveys about their experiences in hospitals across the United States. It includes details like how patients rated the hospital, their satisfaction with different services, and some basic demographic information. The data is collected through a national survey, which makes it possible to compare the performance of different hospitals and track patient satisfaction over time.

SOURCE

The dataset has been sourced from Kaggle's HCAHPS Dataset, which compiles publicly available healthcare performance data.

Why it was chosen

This dataset was selected because it provides real and meaningful information about hospital performance and patient experiences. It can be used to develop key performance indicators (KPIs), identify trends, and compare hospitals over time. The data is well-organized and collected in a standard way, which makes it suitable for analysis, data modeling, and visualization in tools like Power BI. These insights can support better decision-making and help improve the quality of healthcare services.

KPIs(Key Performance Indicator)

1.National Average Top-Box Percentage

Shows the national average of patients giving the highest ratings. Comparing it to a 75% target helps track how well hospitals meet patient expectations over time.

2.Average Response Rate

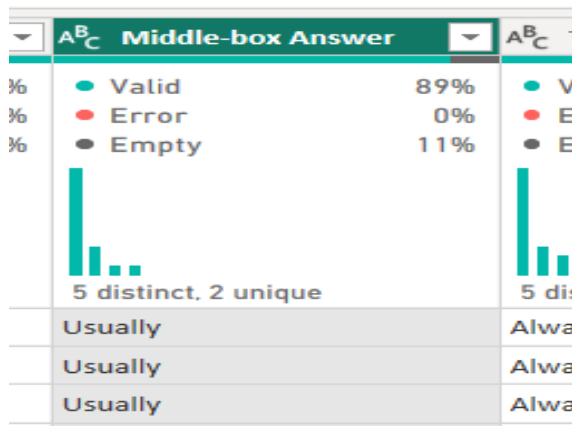
Shows the average percentage of patients who completed the survey. A higher rate means more reliable data, and a 50% target helps identify areas needing better patient engagement.

Added Cards such as **total number of hospitals**, **number of states**, **national average Top-Box score**, and **average response rate** provide a quick and clear overview of the dataset. It helps decision-makers understand hospital performance and patient feedback to support data-driven improvements.

Data Cleaning

Data cleaning is the process of fixing mistakes and removing wrong or messy information from a dataset so it can be used correctly

1)Getting empty values in the QuestionTable replace it by Unkown.



Replace Values

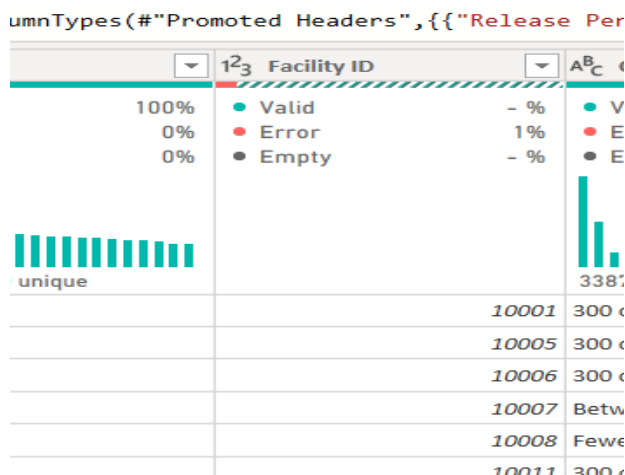
Replace one value with another in the selected columns.

Value To Find:

Replace With:

[Advanced options](#)

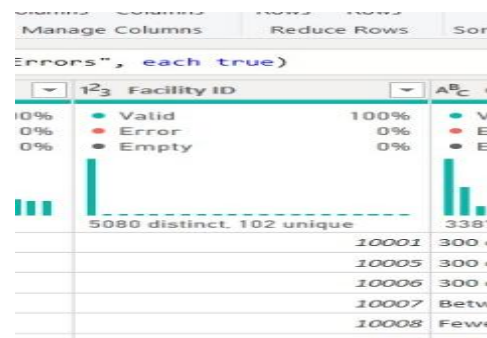
2) Response Table get error in Facility Id and replace error by 0



Replace Errors

Enter the value which will replace errors in the selected columns.

Value:



3)Change Data type and replace error by 0

Transform		Combine
i4. Type}}		
irveys	i2_3	Response Rate (%)
100%	Valid	- %
0%	Error	13%
0%	Empty	- %
5 unique		
		27
		37
		25
299		30
		28
		31
		33
		27
		45
		26
299		30
		34
		30
		28
		29
299		38
		25
		34
		37
		28
		24

Replace Errors

Enter the value which will replace errors in the selected columns.

Value

0

OK

Cancel

	10019	300 or more	26
	10021	Between 100 and 299	30

fx		= Table.ReplaceErrorValues("#"Changed Type1", {	
A8_C	Release Period	A8_C	State
100%	Valid	100%	Valid
0%	Error	0%	Error
0%	Empty	0%	Empty
1 distinct, 0 unique		11 distinct, 0 unique	
1	07_2015	AL	
2	07_2015	AL	
3	07_2015	AL	
4	07_2015	AL	
5	07_2015	AL	
6	07_2015	AL	
7	07_2015	AL	
8	07_2015	AL	
9	07_2015	AL	
10	07_2015	AL	
11	07_2015	AL	
12	07_2015	AL	
13	07_2015	AL	
14	07_2015	AL	
15	07_2015	AL	
16	07_2015	AL	
17	07_2015	AL	
18	07_2015	AL	
19	07_2015	AL	
20	07_2015	AL	
21	07_2015	AL	
22	07_2015	AL	
nfilling based on top 1000 rows			

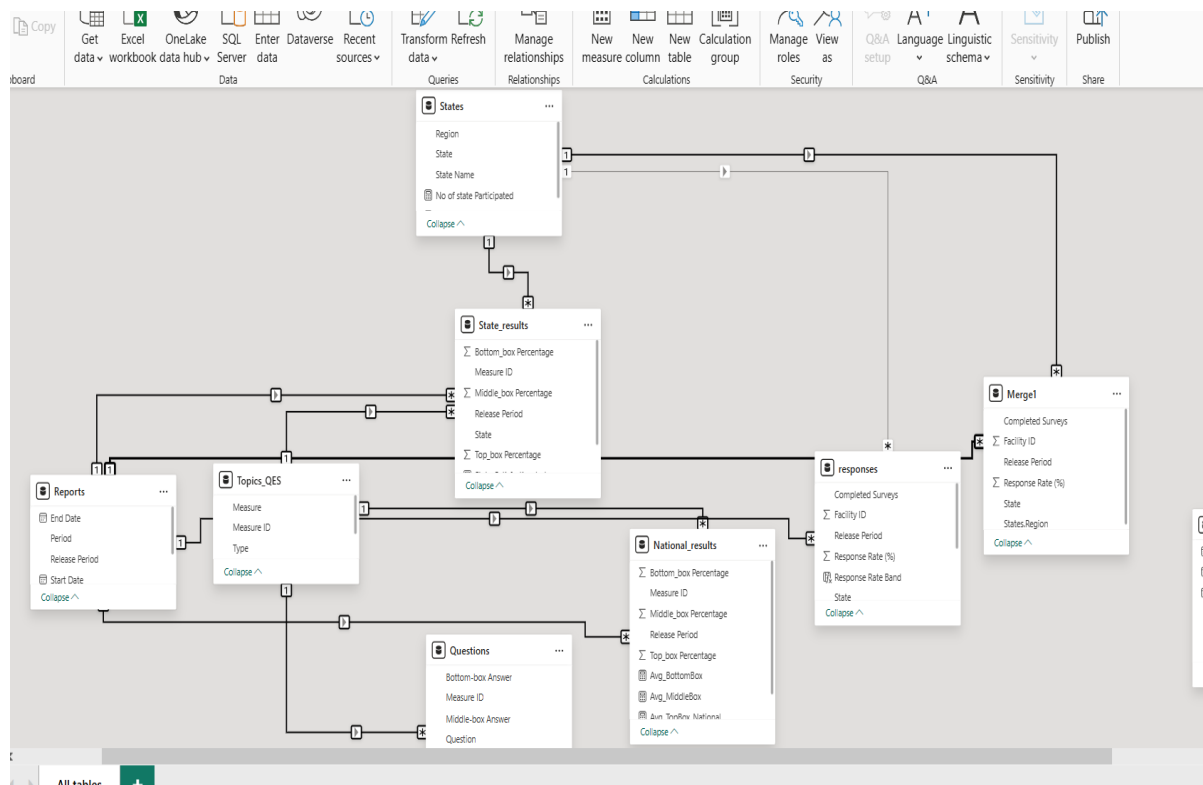
Data Modeling

Building a relationship between tables

Star Schema- A **star schema** is a method of organizing data within a database to facilitate easier understanding, reporting, and analysis. At the center of this schema lies the **fact table**, which stores the key numerical data or measurements. Surrounding the fact table are **dimension tables**, which provide descriptive context for the data

Dimension Tables:- Reports, States, Measures, Questions

Fact Tables:- National Results, State Results, Responses



DAX Formulas

1)Response Rate Band (Calculated Column)

Response Rate Band =

```
SWITCH(  
    TRUE(),
```

```

ISBLANK(Responses[Response Rate (%)]) || NOT ISNUMBER(Responses[Response Rate (%)]), "Not
Available",
Responses[Response Rate (%)] < 20, "< 20% Response Rate",
Responses[Response Rate (%)] >= 20 && Responses[Response Rate (%)] < 40, "20–40% Response
Rate",
Responses[Response Rate (%)] >= 40 && Responses[Response Rate (%)] < 60, "40–60% Response
Rate",
Responses[Response Rate (%)] >= 60, "> 60% Response Rate",
"Not Available"
)

```

Categorizes each facility's survey response rate into meaningful bands for easier analysis.

2)Average Response Rate (Measure)

Average Response Rate :=

```
AVERAGE(Responses[Response Rate (%)])
```

Provides a quick overview of overall survey participation and Can be filtered by state, facility, or report period for more detailed insights.

3)State_Satisfaction_Index(Measure)

State_Satisfaction_Index =

```

CALCULATE(
    AVERAGE(State_Results[Top_box Percentage]) -
    AVERAGE(State_Results[Bottom_box Percentage])
)

```

State_Satisfaction_Index shows how happy patients are in a state. It takes the **average Top-box %** (most positive responses) and **subtracts the average Bottom-box %** (least positive responses).

Higher numbers → more satisfied patients.

Lower numbers → more dissatisfaction.

This gives a **single number per state or period**, making it easy to **compare states, track trends, and spot problem areas**.

4)Facilities_Response

```

Facilities_Response_Above_50 :=CALCULATE(
    DISTINCTCOUNT('Responses'[Facility ID]),
    'Responses'[Response Rate (%)] > 50
)

```

Low-response hospitals can get extra support or reminders to improve participation used to identify specific hospitals underperforming needs training and also what to visit what improvement they want.

M Query

1) Takes the Region column from tables and adds it as a **normal column** in your main table called States.Region. By using Merge query This way, each row now shows the region for that state, and you can easily use it in charts, calculations, or filters.

= **Table.ExpandTableColumn**(Source, "States", {"Region"}, {"States.Region"})

2) This step changes the Response Rate (%) column to a **whole number**, making it easier to do calculations and use in charts.

Table.TransformColumnTypes(#"Filtered Rows",{{"Response Rate (%)", Int64.Type}})

3) This step adds a new column Period that combines the Start Date and End Date into a single text like "01-10-2015 - 30-09-2016" for each row.

= **Table.AddColumn**(#"Changed Type", "Period", each Text.From([Start Date]) & " - " & Text.From([End Date])).

AI VISUAL

The AI feature implemented is a **Q&A button** that enables users to interact with the dataset using natural language queries. By typing questions, users can receive immediate, relevant answers without manually filtering data or constructing visualizations. It improves the better understanding get deep knowledge about visuals.

Visualizations

1) Funnel Chart: "Facility Response Rate Distribution"

- Created a range of response using DAX as response rate band and stages of funnel and it shows counts the no. of facilities are in that band range.
- **Annotations:** Each stage is labeled with the **number of facilities** in that response rate band.
- Shows how many hospitals fall into low, medium, or high response rate ranges.
- Narrow parts of the funnel highlight fewer hospitals reaching higher response rates.
- Helps quickly spot areas with low patient engagement.

2) Heat Map: Patient Satisfaction by State and Measure

- States on rows, survey measures on columns, and the average top-box percentage as color intensity.
- **Annotations:** Darker colors mean higher patient satisfaction, lighter colors mean lower satisfaction.

- Easy to spot which states or measures are performing well or poorly. Helps find patterns and focus on areas that need improvement. And from measure id we can detect in which areas want training like doctors, staff .

3) Tree Map: “Number of Hospitals by Region and State”

- Hierarchy = Region → State, Values = **Count of Facility ID**.
- **Annotations:** Each box represents a state, and bigger boxes mean more hospitals.
- Helps to manage region wise survey data which region are getting more survey and in which state also.

4) Gauge Chart: “State-wise Satisfaction Index vs Target”

- Value = State_Satisfaction_Index (DAX: Average Top-box % - Average Bottom-box %), Target = 50, Tooltip = Average Top-box %, Average Bottom-box %.
- **Annotations:** The gauge shows **current satisfaction index** against the target and tooltip gives more details.
- Quickly identifies states that are above or below the satisfaction target. Helps track performance and focus on areas needing improvement.

Findings and Recommendations

Insights

- National Top-Box % below target (69.40% vs 75%) — Indicates room for improvement in overall patient satisfaction.
- South Atlantic is the region where maximum number of hospitals are participated. Some regions have far more hospitals, which can impact national averages.
- 14096 Hospitals Still getting less than 20 % responses
- Average of Bottom box % is 8.39%
- 07_2016 release period getting the lowest response.
- State Satisfaction Index at 62.94 — Some states are performing well, but others are pulling the average down.
- Discharge information getting most average top_box %.

Recommendations

- **Increase Patient Participation:**
Help hospitals with low response rates through training, reminders, or small rewards.
Run simple awareness drives so more patients fill out the surveys.
- **Improve Weak Areas:**
Pay extra attention to “Care Transition” and “Communication about Medicines,” where scores are low.
Use successful practices from “Discharge Information” to lift weaker areas.
- **Check State Performance:**
Identify states that are not doing well and give them focused support.
Acknowledge high-performing states to motivate others.

- **Watch Trends Closely:**

Regularly review response rates and satisfaction scores to catch problems early.
Adjust strategies based on how results change over each period