

How to create Power BI Dashboard on CMS Healthcare Data via ChatGPT



Step: 1

1. Asking how to analyze CMS data in Power BI



I have CMS SynPUF data in healthcare and I want to do analysis on this data using power BI, how can we do this?



To analyze CMS Synthetic Public Use File (SynPUF) data in Power BI, you need to perform the following steps:  

1. Import the data: You can import the SynPUF data into Power BI by using the "Get Data" option in the Home tab. You can select the appropriate data source such as CSV, Excel, or SQL Server and then import the data into Power BI.
2. Data Cleaning: Clean the data and remove any irrelevant or missing values, standardize column names, and convert data types if necessary.
3. Create Visualizations: Create interactive and informative visualizations using the Power BI Desktop to gain insights into your data. You can create bar charts, pie charts, line charts, scatter plots, etc.
4. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.
5. Interact with Data: In the Power BI Service, you can interact with your visualizations and create drill-through actions, filters, and bookmarks.

Note: Before you start your analysis, make sure you have the correct license and access to the Power BI Desktop and Power BI Service.



Implementation Review: ChatGPT gave a list of steps on how we can approach the required analysis using Power BI.

Step: 2

2. Asking ChatGPT how we can create a data model from given tables



CMS SynPUF data contains 5 files Beneficiary_Summary, Inpatient_Claims, Outpatient_Claims, lcd_Code_Condition, State_and_Code. Can you explain steps to create data model?



To create a data model from CMS Synthetic Public Use File (SynPUF) data, follow these steps:

1. Import the Data: Import the five SynPUF data files (Beneficiary_Summary, Inpatient_Claims, Outpatient_Claims, lcd_Code_Condition, State_and_Code) into Power BI Desktop using the "Get Data" option.
2. Clean and Transform the Data: Clean the data by removing any irrelevant or missing values, standardize column names, and convert data types if necessary. Transform the data to meet your analysis requirements by using the Power BI Query Editor.
3. Create Relationships: Create relationships between the data tables by creating join operations based on common columns. For example, you can join the Beneficiary_Summary table with the Inpatient_Claims table on the Beneficiary ID column.
4. Define Calculated Fields: Define calculated fields by creating DAX expressions that perform calculations based on your data. For example, you can create a calculated field that calculates the average length of stay for inpatient claims.
5. Create a Data Model: Create a data model by using the "Manage relationships" option in the Home tab. You can define the relationships between the tables and create calculated fields as calculated columns or calculated tables.
6. Create Visualizations: Create interactive and informative visualizations using the Power BI Desktop to gain insights into your data. You can create bar charts, pie charts, line charts, scatter plots, etc.
7. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.



Implementation Review: Although ChatGPT was able to give brief idea on how we create a functional data model using the mentioned tables, Proper understanding at field level is required to implement the data model in Power BI.

Step: 3

3. Asking for a card that show the count of beneficiaries



Beneficiary_Summary table has the field DESYNPUF_ID & I want the unique count of beneficiaries in the card



To get the unique count of beneficiaries in the CMS Synthetic Public Use File (SynPUF) Beneficiary_Summary table in Power BI, follow these steps:



1. Load the Beneficiary_Summary table: Load the Beneficiary_Summary table into Power BI using the "Get Data" option.
2. Create a measure: In the Power BI Desktop, create a new measure to count the unique values of beneficiaries by using the DAX expression "`=DISTINCTCOUNT(Beneficiary_Summary[DESYNPUF_ID])`".
3. Create a Card visualization: To display the unique count of beneficiaries, create a Card visualization in the Power BI Desktop by dragging the measure you created to the Value field in the visualization.
4. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.



Implementation Review: ChatGPT was able to provide the correct DAX which was working (verified in Power BI).

Step: 4

4. Asking logic to compute death ratio of beneficiaries via DAX.



we have beneficiaries death dates in BENE_DEATH_DT and repetitive beneficiaries in DESYNPUF_ID. we want the death ratio of beneficiaries.



To calculate the death ratio of beneficiaries in the CMS Synthetic Public Use File (SynPUF) Beneficiary_Summary table in Power BI, follow these steps:



1. Load the Beneficiary_Summary table: Load the Beneficiary_Summary table into Power BI using the "Get Data" option.
2. Create a measure for the number of deaths: In the Power BI Desktop, create a new measure to count the number of beneficiaries who have a death date recorded. You can use the DAX expression `"=COUNT(Beneficiary_Summary[BENE_DEATH_DT])"`.
3. Create a measure for the total number of beneficiaries: In the Power BI Desktop, create another measure to count the total number of beneficiaries, regardless of whether they have a death date recorded. You can use the DAX expression `"=DISTINCTCOUNT(Beneficiary_Summary[DESYNPUF_ID])"`.
4. Calculate the death ratio: Create a third measure to calculate the death ratio by dividing the number of deaths by the total number of beneficiaries. You can use the DAX expression `"=[Number of Deaths] / [Total Number of Beneficiaries]"`.
5. Create a Card visualization: To display the death ratio, create a Card visualization in the Power BI Desktop by dragging the death ratio measure you created to the Value field in the visualization.
6. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.



Implementation Review: After many attempts of rephrasing our problem statement ChatGPT was able to provide correct DAX which was working (verified in Power BI).

Step: 5

5. Asking for a unique inpatient count



In Inpatient_Claims table DESYNPUF_ID is beneficiaries id field. give me unique patient count.



To get the unique count of patients in the CMS Synthetic Public Use File (SynPUF) Inpatient_Claims table in Power BI, follow these steps:



1. Load the Inpatient_Claims table: Load the Inpatient_Claims table into Power BI using the "Get Data" option.
2. Create a measure: In the Power BI Desktop, create a new measure to count the unique values of patients by using the DAX expression
"`=DISTINCTCOUNT(Inpatient_Claims[DESYNPUF_ID])`".
3. Create a Card visualization: To display the unique count of patients, create a Card visualization in the Power BI Desktop by dragging the measure you created to the Value field in the visualization.
4. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.

Note: Before you start your analysis, make sure you have the correct license and access to the Power BI Desktop and Power BI Service.



Implementation Review: ChatGPT was able to provide correct DAX which was working (verified in Power BI).

Step: 6

6. Asking for unique outpatient count



In Outpatient_Claims table DESYNPUF_ID is beneficiaries id field. give me unique patient count.



To get the unique count of patients in the CMS Synthetic Public Use File (SynPUF) Outpatient_Claims table in Power BI, follow these steps:



1. Load the Outpatient_Claims table: Load the Outpatient_Claims table into Power BI using the "Get Data" option.
2. Create a measure: In the Power BI Desktop, create a new measure to count the unique values of patients by using the DAX expression "`=DISTINCTCOUNT(Outpatient_Claims[DESYNPUF_ID])`".
3. Create a Card visualization: To display the unique count of patients, create a Card visualization in the Power BI Desktop by dragging the measure you created to the Value field in the visualization.
4. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.

Note: Before you start your analysis, make sure you have the correct license and access to the Power BI Desktop and Power BI Service.



Implementation Review: ChatGPT was able to provide correct DAX which was working (verified in Power BI).

Step: 7

7. Asking for a pie chart to show the gender percentage



In Beneficiary_Summary table BENE_SEX_IDENT_CD is the gender column, DESYNPUF_ID column has ids for beneficiaries who might be repeating. we want a pie chart for gender that has unique beneficiaries.



To create a pie chart for gender in the CMS Synthetic Public Use File (SynPUF) Beneficiary_Summary table in Power BI that shows the unique count of beneficiaries, follow these steps:



1. Load the Beneficiary_Summary table: Load the Beneficiary_Summary table into Power BI using the "Get Data" option.
2. Create a measure for the unique count of beneficiaries: In the Power BI Desktop, create a new measure to count the unique values of beneficiaries by using the DAX expression `"=DISTINCTCOUNT(Beneficiary_Summary[DESYNPUF_ID])"`.
3. Create a pie chart visualization: In the Power BI Desktop, create a pie chart visualization by selecting the "Pie chart" option in the "Visualizations" pane.
4. Group the data by gender: In the Fields pane, drag the "BENE_SEX_IDENT_CD" field to the "Legend" field and the measure you created to the "Values" field.
5. Format the chart: Format the chart as desired to make it visually appealing and easy to understand.
6. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.

Note: Before you start your analysis, make sure you have the correct license and access to the Power BI Desktop and Power BI Service.



Implementation Review: ChatGPT was able to give a basic idea on how we can implement the solution but it is not efficient enough to understand the differences between each field values mentioned in individual graph/item in Power BI. There were multiple instances of confusion between values, legends, tooltip, etc.

Step: 8

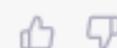
8. Asking for a pie chart to show the gender percentage



In Beneficiary_Summary table BENE_RACE_CD is the race column, DESYNPUF_ID column has ids for beneficiaries who might be repeating. we want a column chart for race that has unique beneficiaries.



To create a column chart for race in the CMS Synthetic Public Use File (SynPUF) Beneficiary_Summary table in Power BI that shows the unique count of beneficiaries, follow these steps:



1. Load the Beneficiary_Summary table: Load the Beneficiary_Summary table into Power BI using the "Get Data" option.
2. Create a measure for the unique count of beneficiaries: In the Power BI Desktop, create a new measure to count the unique values of beneficiaries by using the DAX expression "`=DISTINCTCOUNT(Beneficiary_Summary[DESYNPUF_ID])`".
3. Create a column chart visualization: In the Power BI Desktop, create a column chart visualization by selecting the "Column chart" option in the "Visualizations" pane.
4. Group the data by race: In the Fields pane, drag the "BENE_RACE_CD" field to the "Axis" field and the measure you created to the "Values" field.
5. Format the chart: Format the chart as desired to make it visually appealing and easy to understand.
6. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.



Implementation Review: ChatGPT was able to give a basic idea on how we can implement the solution but it is not efficient enough to understand the differences between each field values mentioned in individual graph/item in Power BI. There were multiple instances of confusion between values, legends, tooltip, etc.

Step: 9

9. Asking for a column chart for given age range bins



In the Beneficiary_Summary table BENE_DEATH_DT is the death date column, CLAIM_YEAR column has the year information. we want a column chart as per age bins



To create a column chart for age bins in the CMS Synthetic Public Use File (SynPUF) Beneficiary_Summary table in Power BI that shows the death count of beneficiaries, follow these steps:



1. Load the Beneficiary_Summary table: Load the Beneficiary_Summary table into Power BI using the "Get Data" option.
2. Create a calculated column for age: In the Power BI Desktop, create a calculated column for age by subtracting the "BENE_BIRTH_DT" field from the "CLAIM_YEAR" field.
3. Create a measure for death count: In the Power BI Desktop, create a new measure to count the death dates of beneficiaries by using the DAX expression "`=COUNT(Beneficiary_Summary[BENE_DEATH_DT])`".
4. Create a column chart visualization: In the Power BI Desktop, create a column chart visualization by selecting the "Column chart" option in the "Visualizations" pane.
5. Group the data by age bins: In the Fields pane, drag the calculated column you created for age to the "Axis" field and the measure you created for death count to the "Values" field. You can also use the "bin" feature to group the age data into age bins, such as 0-10, 11-20, etc.
6. Format the chart: Format the chart as desired to make it visually appealing and easy to understand.
7. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.



Implementation Review: ChatGPT was able to give correct logic for how to create calculated column, and how we can implement the solution.

Step: 10

10. Asking for a map chart as per states and number of beneficiaries



In State_and_Code table SP_STATE_CODE is the state column which has a relationship with Beneficiary_Summary, DESYNPUF_ID column has ids for beneficiaries who might be repeating. we want a shape map chart for states that has unique beneficiaries.



To create a shape map chart for states in the CMS Synthetic Public Use File (SynPUF) State_and_Code table in Power BI that shows the unique count of beneficiaries, follow these steps:



1. Load the State_and_Code and Beneficiary_Summary tables: Load both the State_and_Code and Beneficiary_Summary tables into Power BI using the "Get Data" option.
2. Create a relationship between the two tables: In the Power BI Desktop, create a relationship between the two tables by right-clicking on the "State_and_Code" table, selecting "Manage relationships", and creating a new relationship based on the "SP_STATE_CODE" field in both tables.
3. Create a measure for the unique count of beneficiaries: In the Power BI Desktop, create a new measure to count the unique values of beneficiaries by using the DAX expression `"=DISTINCTCOUNT(Beneficiary_Summary[DESYNPUF_ID])"`.
4. Create a shape map visualization: In the Power BI Desktop, create a shape map visualization by selecting the "Shape map" option in the "Visualizations" pane.
5. Group the data by state: In the Fields pane, drag the "SP_STATE_CODE" field to the "Location" field and the measure you created to the "Values" field.
6. Format the chart: Format the chart as desired to make it visually appealing and easy to understand.
7. Publish Report: Once you have created your visualizations, you can publish your report to the Power BI Service. This allows you to share your report with others and collaborate on your data.

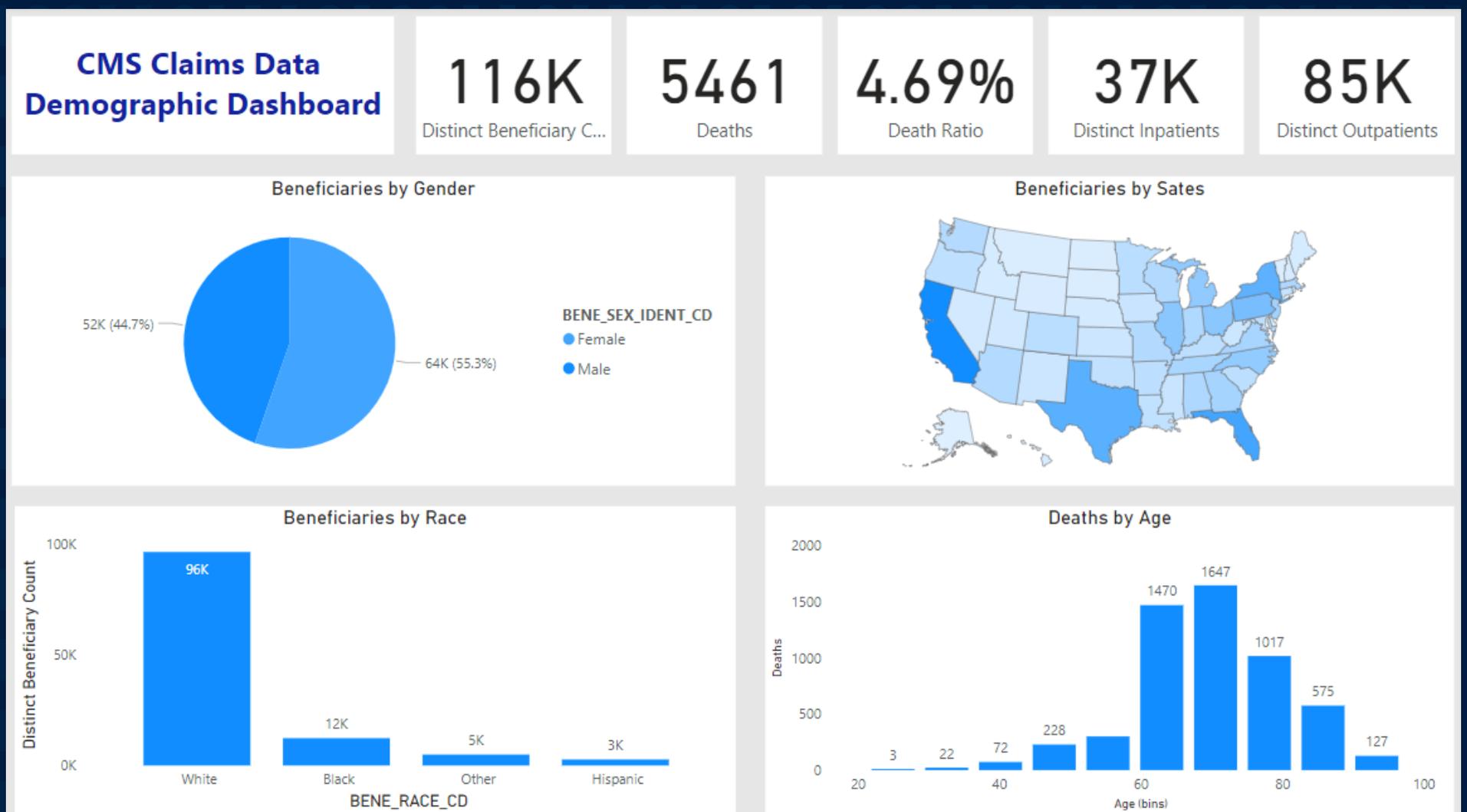


Implementation Review: ChatGPT was able to give a basic idea of how we can implement the solution but it is not efficient enough to understand the differences between each field value mentioned in individual graph/items in Power BI. There were multiple instances of confusion between values, legends, tooltips, etc.

Conclusion:

While ChatGPT provided an overview of steps and proved to be very useful in creating basic DAX logic for measures and columns in PowerBI but when we dived into visualization the answers provided were ambiguous and not detailed enough for a beginner to put into practice. The below snip depicts the final Dashboard after we combined all the solutions obtained from the above steps.

Final result dashboard using ChatGPT



ChatGPT efficiency in Power BI:

- Process summary
- Basic idea of the data model
- Easy DAX
- Simple M code
- Basic chart
- Suggestion general metrics & visuals

Efficient

Partially
Efficient

- Comprehensive journey in one shot
- Entire procedure of the data model
- Detailed DAX
- Complex M code
- Advanced chart
- User-required metrics & visuals



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