HCM
HEALTHCARE CLAIMS MANAGEMENT

Presentation on :-
"A Comprehensive Overview of Healthcare Utilization: Inpatient, Outpatient, and Provider Data Analysis"

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OBJECTIVE

To leverage the dataset for understanding healthcare utilization trends, evaluating provider performance, and identifying opportunities to improve patient outcomes while reducing costs across the healthcare system.

Q1. Retrieve the total amount reimbursed (InscClaimAmtReimbursed) for inpatient claims grouped by provider.

Ans

```
SELECT
    Provider,
    SUM(InscClaimAmtReimbursed) AS TotalReimbursedAmount
FROM
    inpatientdata
GROUP BY
    Provider
ORDER BY
    TotalReimbursedAmount DESC;
```

Q2. Identify the top 5 providers with the highest number of outpatient claims.

Ans

```
SELECT
    Provider,
    COUNT(*) AS ClaimCount
FROM
    outpatientdata
GROUP BY
    Provider
ORDER BY
    ClaimCount DESC
LIMIT 5;
```

Q3.Find the number of beneficiaries with claims associated with chronic conditions like diabetes (ChronicCond_Diabetes = 1).

Ans

```
SELECT COUNT(DISTINCT b.BeneID) AS NumBeneficiariesWithDiabetes
FROM inpatientdata id
JOIN beneficiarydata b ON id.BeneID = b.BeneID
WHERE b.ChronicCond_Diabetes = 1;
```

Q4. Calculate the average inpatient claim amount reimbursed (InscClaimAmtReimbursed) for each gender.

Ans

```
SELECT
    b.Gender,
    AVG(id.InscClaimAmtReimbursed) AS AverageReimbursementAmount
FROM
    inpatientdata id
JOIN
    beneficiarydata b
    ON id.BeneID = b.BeneID
GROUP BY
    b.Gender
ORDER BY
    AverageReimbursementAmount DESC;
```

Q5. Retrieve all claims (inpatient and outpatient) for a specific BeneID to analyze an individual beneficiary's history.

Ans

```
SELECT BeneID, ClaimID, ClaimStartDt, ClaimEndDt, Provider, InscClaimAmtReimbursed
FROM inpatientdata
WHERE BeneID = 'BENE11031'
UNION SELECT BeneID, ClaimID, ClaimStartDt, ClaimEndDt, Provider, InscClaimAmtReimbursed
FROM outpatientdata
WHERE BeneID = 'BENE11031';
```

Q6. Identify providers with claims where the admission date (AdmissionDt) is in 2009 and the reimbursed amount exceeds $10,000.

Ans

```
SELECT DISTINCT Provider
FROM inpatientdata
WHERE YEAR(AdmissionDt) = 2009
AND InscClaimAmtReimbursed > 10000;
```

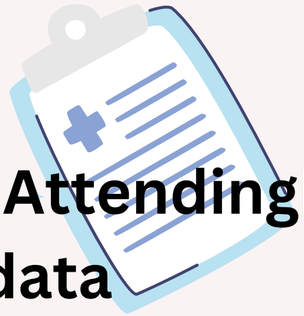
Q7. Combine beneficiary demographic information with inpatient claims to calculate the average deductible amount (IPAnnualDeductibleAmt) for beneficiaries aged 65+.

Ans

```
SELECT AVG(b.IPAnnualDeductibleAmt) AS AvgDeductibleAmount
FROM inpatientdata id
JOIN beneficiarydata b ON id.BeneID = b.BeneID
WHERE TIMESTAMPDIFF(YEAR, b.DOB, CURDATE()) >= 65;
```

Q8. List all claims involving more than one physician (AttendingPhysician, OperatingPhysician, or OtherPhysician are non-null).

Ans



```
SELECT claimid, AttendingPhysician, OperatingPhysician, OtherPhysician
FROM inpatientdata
WHERE (AttendingPhysician IS NOT NULL AND OperatingPhysician IS NOT NULL)
  OR (AttendingPhysician IS NOT NULL AND OtherPhysician IS NOT NULL)
  OR (OperatingPhysician IS NOT NULL AND OtherPhysician IS NOT NULL);
```

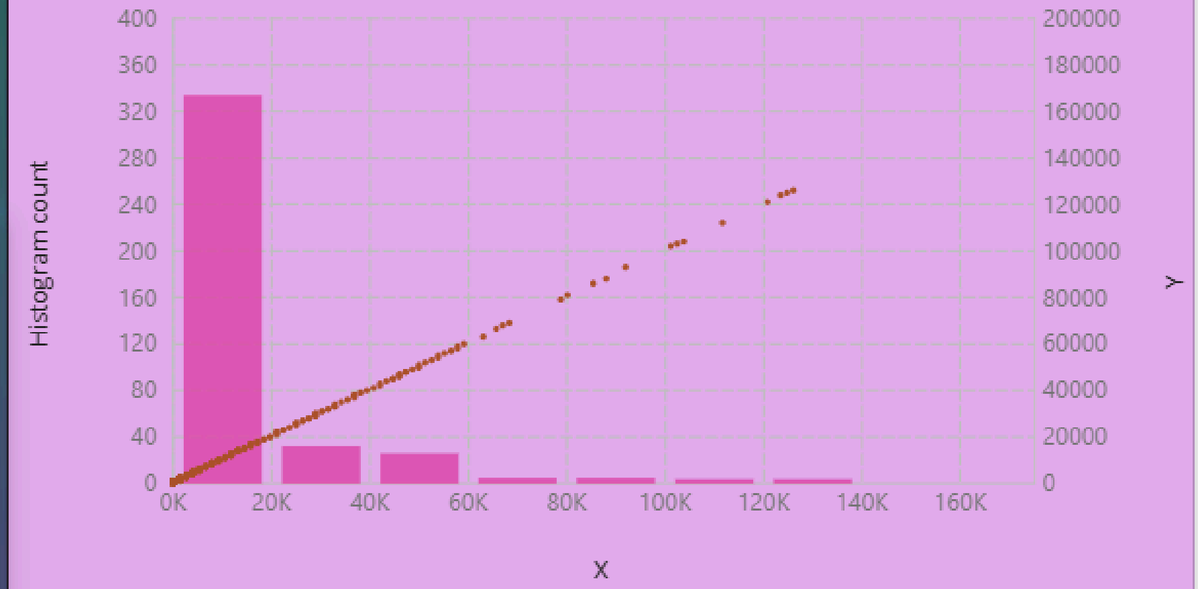
Claim Overview

Claim | Provider | Demographic | Trends

110K
Total Claims

1.24K
Average Claim Amount

Distribution of Claims Amount



Provider

All

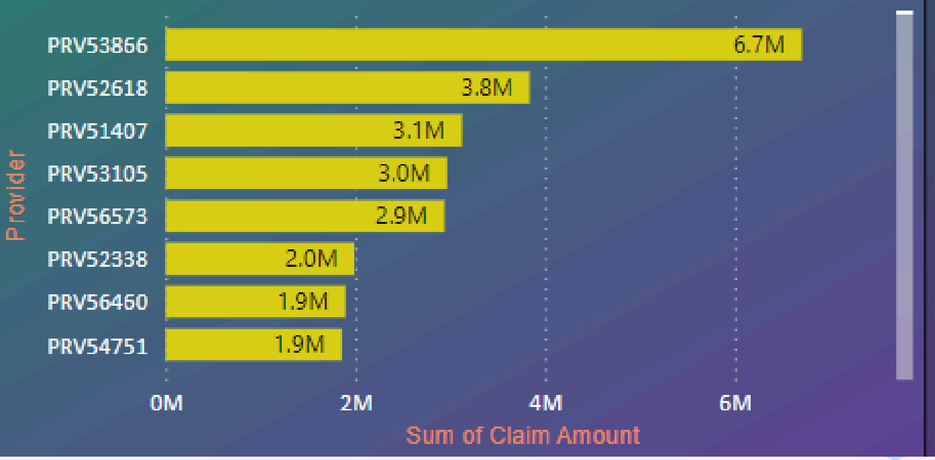
State

All

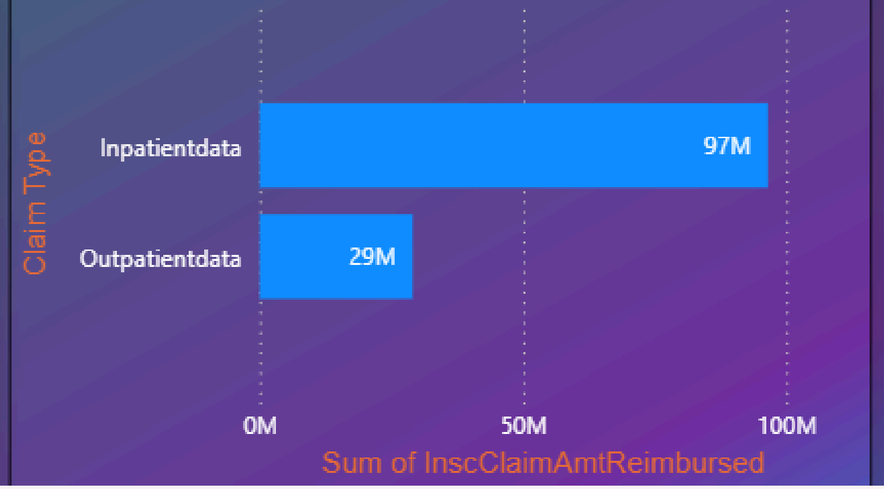
Claim Type

- Inpatientdata
- Outpatientdata

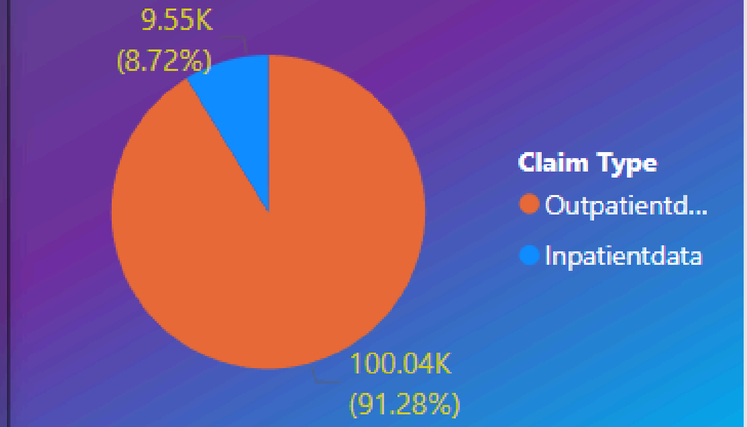
Total Inpatient Claim Amounts Reimbursed Across Providers



Total Reimbursement (Inpatient vs. Outpatient)



Inpatient vs. Outpatient Claims Count



Provider Analysis

Claim | Provider | Demographic | Trends

1340
Number of Providers

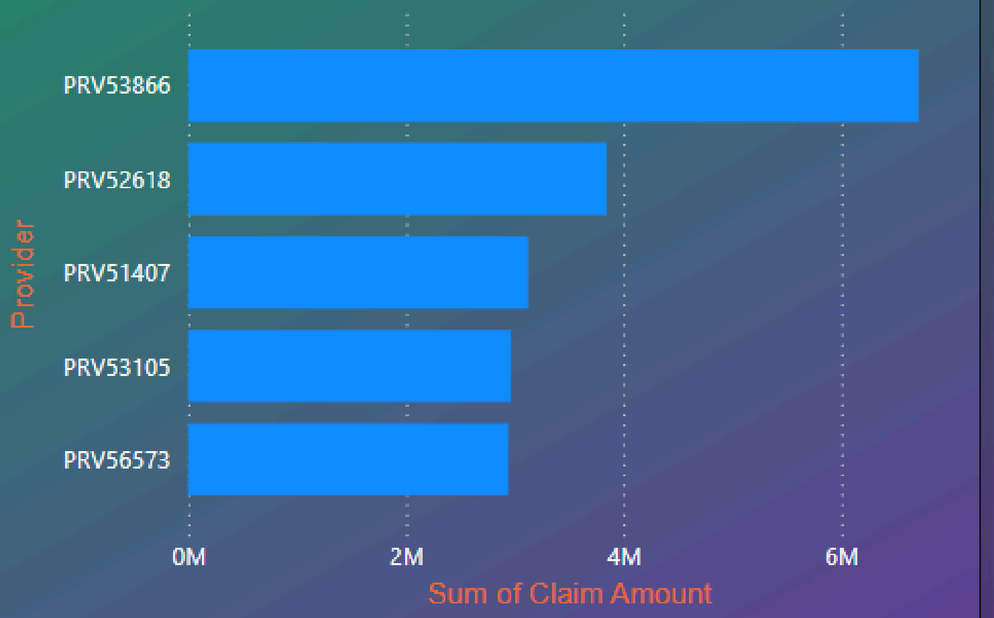
Provider
All

125.57M
Total Reimbursement by Providers

Year
All

State
All

Top 5 Providers (by Claim Count or Reimbursement Amount)



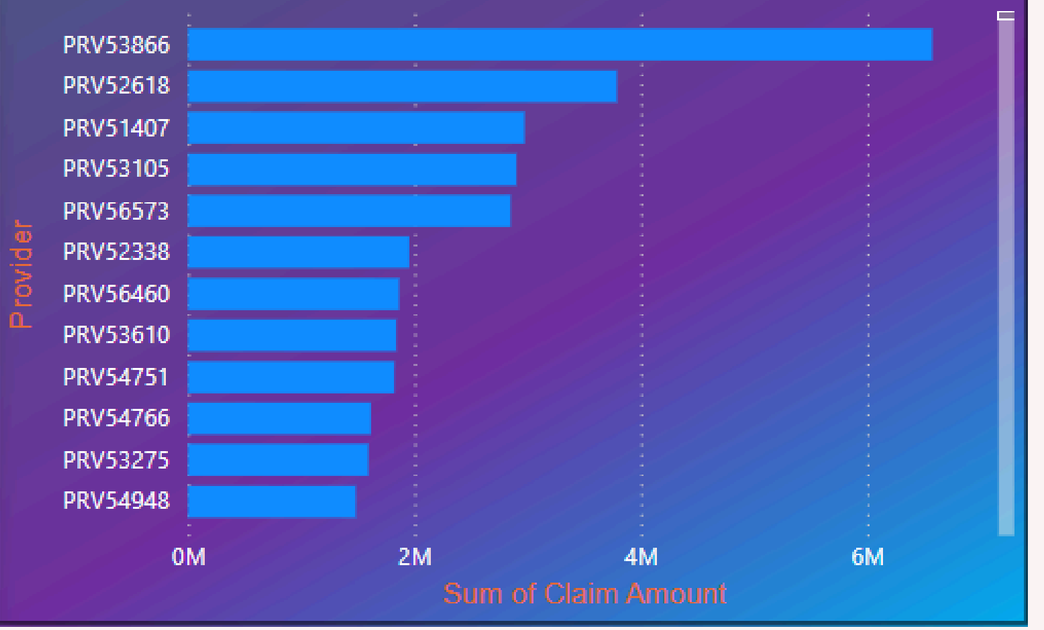
Highlight providers with the highest claim amounts in 2009.

Provider	Total Claim Amount
PRV53866	6575164
Total	**6575164**

Highlight providers with lowest claim amounts in 2009.

Provider	Total Claim Amount
PRV56085	0
Total	**0**

Highlight Providers with High-Value Claims (>$10,000 in 2009)



Demographic Insights

Claim | Provider | Demographic | Trends

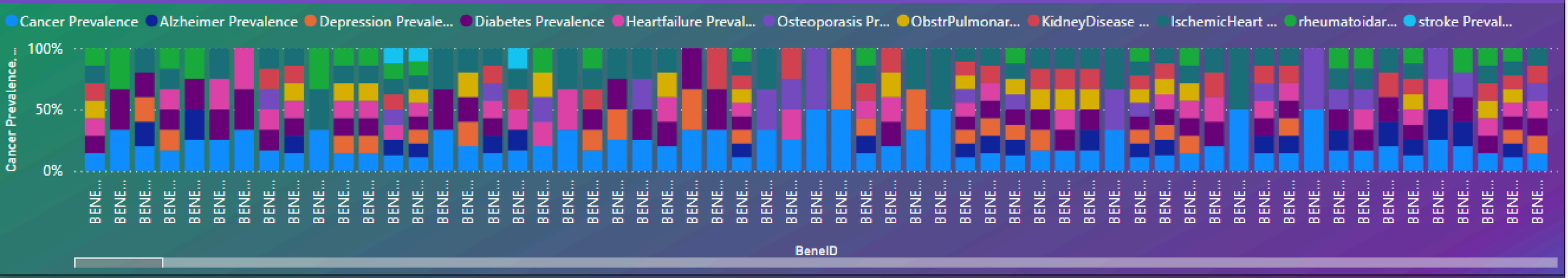
57K
Number of Beneficiaries

94
AvgDeductible65Plus

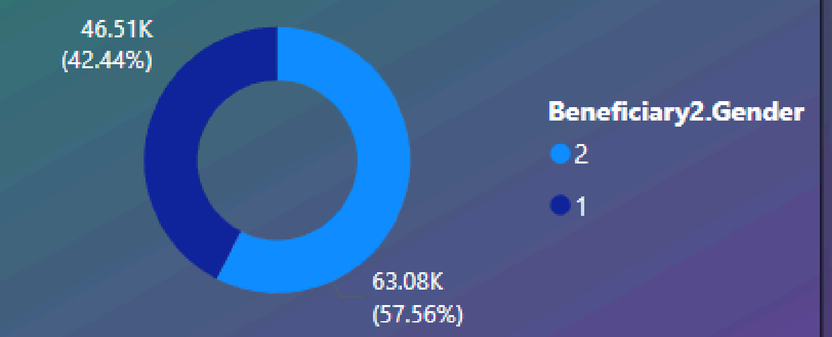
ChronicCond_Alzheimer
All

ChronicCond_Diabetes
All

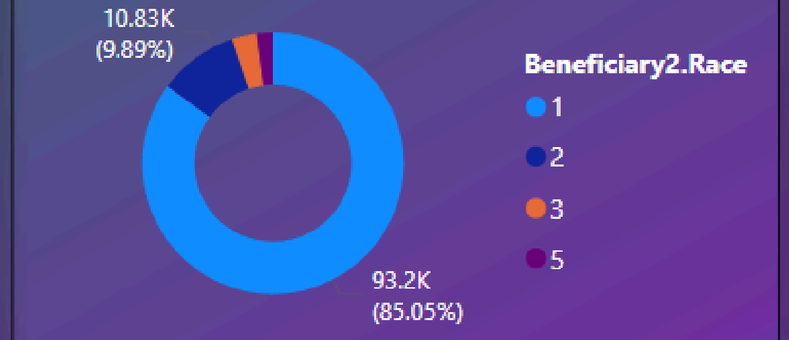
Chronic condition Breakdown



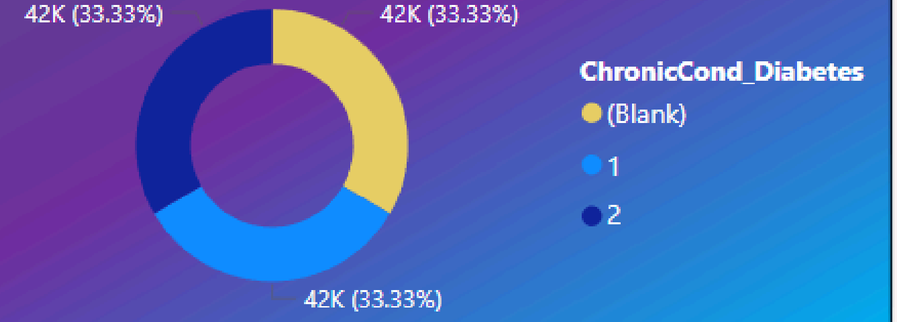
Beneficiary Gender Breakdown



Beneficiary Race Breakdown



Chronic Condition Prevalence(Diabetes)



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Trends Over Time

Claim | Provider | Demographic | Trends

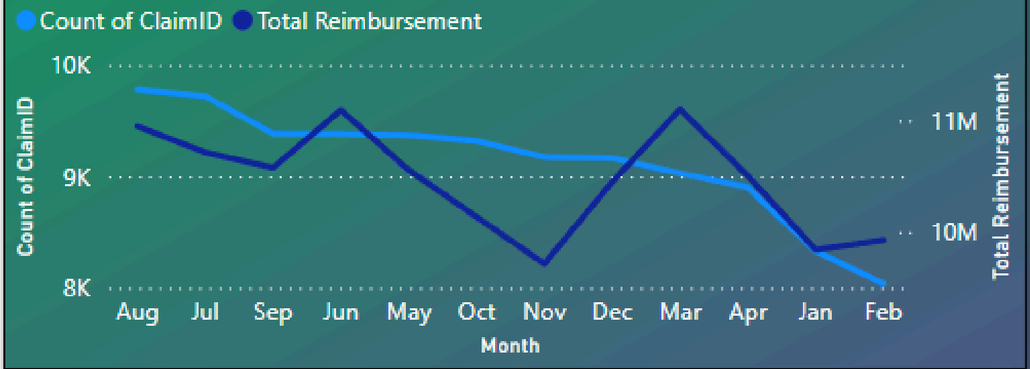
1.24K
Average Claim Amount (Monthly)

11M
HighestMonth

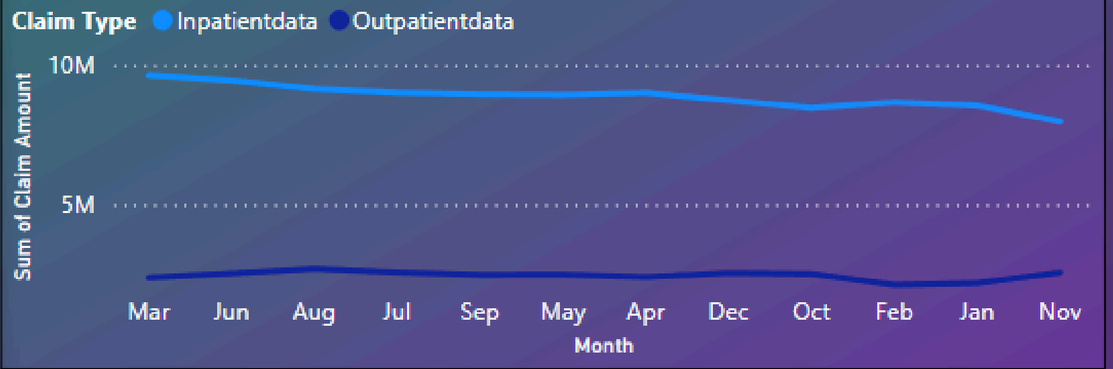
32M
HighestQuarter

Claim Type
All

Monthly Trends of Claims Count and Reimbursement Amount

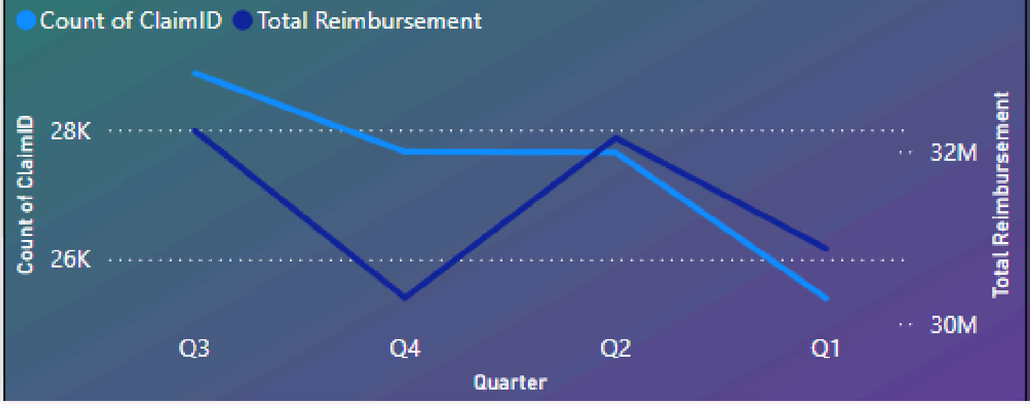


Comparison of Inpatient and Outpatient Claims Over Time By Month

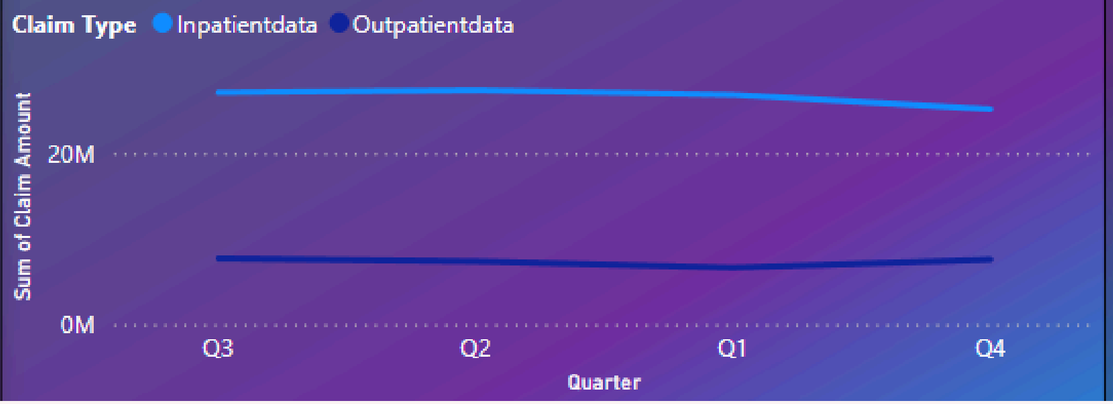


Month
All

Quarterly Trends of Claims Count and Reimbursement Amount



Comparison of Inpatient and Outpatient Claims Over Time By Quarter



Quarter
All

Key Insights

This is key insight and findings of SQL:-

- **Inpatient Reimbursement by Provider (Q1):**

a. Query Purpose: Identifies providers benefiting the most from inpatient reimbursements.

b. Additional Insights:

  - Detect regional patterns by combining provider information with location data.
  - Trend analysis: Use time-series data to see how reimbursements evolve over months or years.

- **Top Providers for Outpatient Claims (Q2):**

a. **Query Purpose:** Highlights providers with significant outpatient activity.

b. **Additional Insights:**

  - Compare the top providers with their inpatient activity to assess service diversity.
  - Measure claim-to-reimbursement ratios to evaluate cost efficiency.

- **Beneficiaries with Chronic Conditions (Q3):**

a. **Query Purpose:** Focuses on chronic diabetes-related claims.

b. **Additional Insights:**

  - Expand to include multiple chronic conditions (e.g., heart disease, hypertension).
  - Correlate chronic conditions with claim costs to understand financial impacts.

- **Gender-Based Reimbursement Trends (Q4):**
  a. **Query Purpose:** Understand gender disparities in healthcare reimbursements.
  b. **Additional Insights:**
    - Include age group segmentation within genders for more granular insights.
    - Evaluate trends over time to identify shifts in reimbursement patterns.

- **Beneficiary Claim History (Q5):**
  a. **Query Purpose:** Comprehensive claims history for a beneficiary.
  b. **Additional Insights:**
    - Analyze frequency of claims over time to identify patterns (e.g., high usage during a specific period).
    - Overlay with medical history for predictive insights on future healthcare needs.

- **High-Reimbursement Claims (Q6):**
  a. **Query Purpose:** Pinpoints providers involved in high-value claims from 2009.
  b. **Additional Insights:**
    - Analyze seasonal trends (e.g., more high-value claims in certain months).
    - Identify common medical procedures or diagnoses leading to high reimbursements.

- **Deductible Analysis for Elderly Beneficiaries (Q7):**
  a. **Query Purpose:** Evaluates deductible amounts for seniors.
  b. **Additional Insights:**
    - Compare average deductible amounts across different regions or plans.
    - Assess financial risk by examining claim patterns alongside deductible values.

- **Multi-Physician Claims (Q8):**

a. **Query Purpose:** Highlights claims requiring multiple physicians.

b. **Additional Insights:**

Analyze the types of procedures commonly involving multiple physicians.

Examine patient outcomes for multi-physician claims versus single-physician claims.

The following is the key insight of PowerBI:-

- **Claim Overview**
- **Total Claims:** The data indicates a significant volume of claims, with a total of 110,000 claims processed, and a total reimbursement amount of approximately $125.57 million.
- **Claim Distribution:** The distribution of claim amounts shows a notable concentration of claims, with a significant number of high-value claims (greater than $10,000).
- **Provider Analysis**
- **Top Providers:** The analysis highlights the top five providers by claim amount, with the highest claim amount recorded for PRV5386 at $575,164.
- **Provider Count:** There are 1,340 providers involved in the claims process, indicating a broad network of healthcare providers.
- Other notable providers include PRV5261 and PRV5140, indicating a competitive landscape among providers.

- **DEMOGRAPHIC INSIGHTS**
- **Chronic Conditions:** The data reveals a breakdown of chronic conditions among beneficiaries, with 57,000 cases of Alzheimer's and 94,000 cases of diabetes reported.
- **Beneficiary Gender Breakdown:** The prevalence of chronic conditions is also analyzed by gender, with 33.33% of beneficiaries affected by diabetes.
- **Race Gender Breakdown:**

1. **Percentage Representation**: Analyzing the percentage of different racial and ethnic groups (e.g., Caucasian, African American, Hispanic, Asian, Native American) among beneficiaries can highlight diversity in the patient population.
2. **Underrepresentation**: Certain racial groups may be underrepresented in claims data, which can indicate barriers to access healthcare services.

- **TRENDS OVER TIME**
- **Monthly Trends:** There are monthly trends in claims count and reimbursement, with peaks observed in certain months, suggesting seasonal variations in healthcare utilization.
- **Inpatient vs. Outpatient Claims:** The comparison of inpatient and outpatient claims over time indicates a trend that may reflect changing patterns in healthcare delivery and patient management.
- **Quarterly Trends:**
- A comparison of inpatient and outpatient claims over time shows distinct patterns. The data suggests that 91.28% of claims are outpatient, indicating a trend towards outpatient care.
- Quarterly analysis can reveal how the volume of claims changes with each quarter, potentially reflecting seasonal healthcare needs or changes in patient management strategies.

Conclusion

Overall, the findings suggest a complex landscape of healthcare claims characterized by a significant number of high-value claims, a diverse provider network, and notable trends in chronic conditions among beneficiaries. The data can be useful for identifying areas for improvement in healthcare delivery and reimbursement strategies.

Thank you for your attention