

Centers for Medicare and Medicaid Services (CMS) Data Report

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Part 1: CMS Data Exercise

The Centers for Medicaid and Medicare Services publish a quarterly report containing daily staffing data for all registered nursing homes in the U.S. This dataset is called Payroll Based Journal (PBJ) Daily Nurse Staffing and can be found [here](#). You can review the data dictionary to better understand the data that's available, but a few notes pertaining to this exercise:

- Nursing homes are staffed by both employees and contractors. Employees work for the nursing home full time, whereas contractors work for the nursing home on a temporary basis. Most nursing homes are staffed using some combination of full-time employees and contractors, but the proportions within each nursing home can vary substantially. All workers from Contractors in HealthCare Industry (and our competitors) are classified as contractors.
- There are a variety of other datasets that can be joined to this dataset, all found under the [nursing home data](#) section on CMS' website.
- As mentioned previously, the PBJ data is separated by quarter. For this exercise, please focus on the most recent quarter available (2024Q1).

PART 1: PROBLEM ANALYSIS AND RECOMMENDATIONS TO THE SALES ANALYSIS TEAM

Executive Summary

This report presents a strategic analysis of the long-term healthcare provider market for Contractors in HealthCare, with a focus on identifying competitive opportunities through staffing inefficiencies. Key areas of investigation include:

- **Understaffed Centers:** Identifying facilities with staffing levels below the CMS-required threshold of 3.48 hours per resident per day.
- **Contractor vs. Full-Time Employee Ratios:** Exploring the potential for increasing contractor usage in facilities with low contractor deployment.
- **Staff Turnover Trends:** Highlighting turnover rates and using these trends to forecast staffing needs for future market penetration. By targeting understaffed centers, increasing contractor presence, and leveraging turnover forecasts, Contractors in HealthCare Industry can secure a competitive advantage in the healthcare staffing market.

Problem Statement:

The long-term healthcare provider market faces significant staffing challenges, exacerbated by high staff turnover and a heavy reliance on full-time employees. Contractors, a healthcare staffing solutions provider, seeks to capitalize on these inefficiencies by offering flexible staffing solutions. This report analyzes the market to identify potential opportunities, including facilities that are understaffed, those with low contractor use, and those with high turnover rates, presenting a pathway for Contractors in HealthCare to increase market penetration and gain a competitive edge.

Recommendation #1: Finding Understaffed Centers

Findings:

According to CMS regulations ([Official CMS Webpage Article](#)), long-term care facilities are required to provide at least 3.48 hours of direct care per resident per day (HRPD). Facilities that fall below this threshold of **3.48 hours** are at risk of penalties and operational inefficiencies.

Supporting Data:

Fig. 1 shows the top 5 most understaffed facilities, highlighting their Provider & Affiliated Entity Name, and location.

Actionable Steps:

Contractors in HealthCare Industry should prioritize outreach to these facilities, offering contractor staffing solutions to fill the gap in HRPD.

Expected Outcome:

Improved staffing compliance for targeted facilities and increased business for Contractors in HealthCare Industry as a preferred staffing partner.

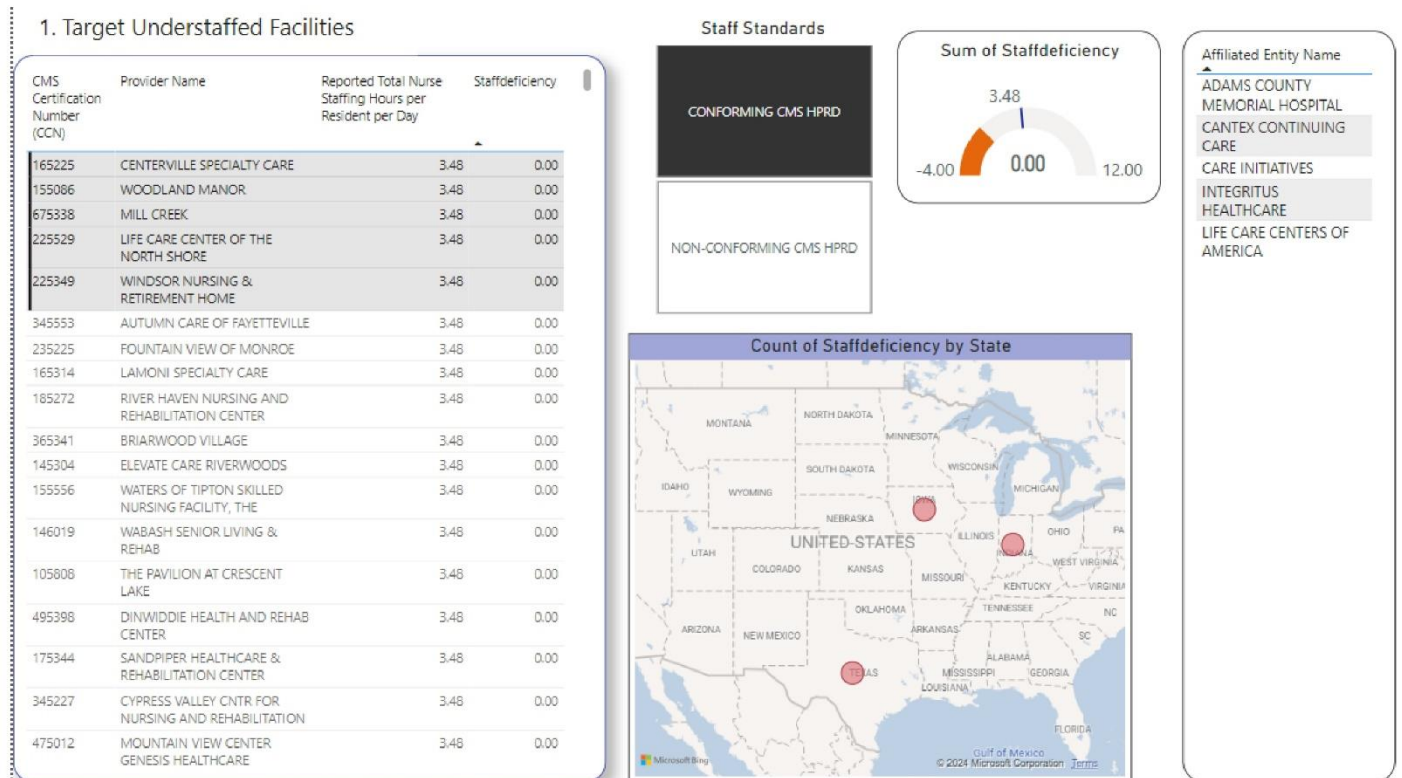


Fig.1 shows the Top 5 highlighted by Provider & Affiliated Entity Name and the location it is of the highly Understaffed

Recommendation #2: Increase Contractor Usage in Understaffed Centers

Findings:

Many long-term care facilities are heavily reliant on full-time employees, with little to no contractor engagement and staffing deficiency (less than 3.48 HRPD) or understaffed. This presents an opportunity for Contractors in HealthCare Industry to introduce contractors as a flexible solution, especially in facilities struggling with full-time staffing.

Supporting Data:

Fig. 2 illustrates a comparison between contractor and full-time employee work hours for the top 5 affiliated entities. It reveals that these entities have low contractor usage relative to their total staffing needs.

Actionable Steps:

Increase contractor engagement in these facilities by emphasizing the flexibility and cost-effectiveness of contractor staffing to manage workforce fluctuations.

Expected Outcome:

Greater adoption of contractors in understaffed facilities, resulting in higher staffing flexibility and reduced HRPD gaps.

Glossary: Employee (in Employee Type) refers to Full Time Employees.

2. Nursing Homes with Low Contractor Usage

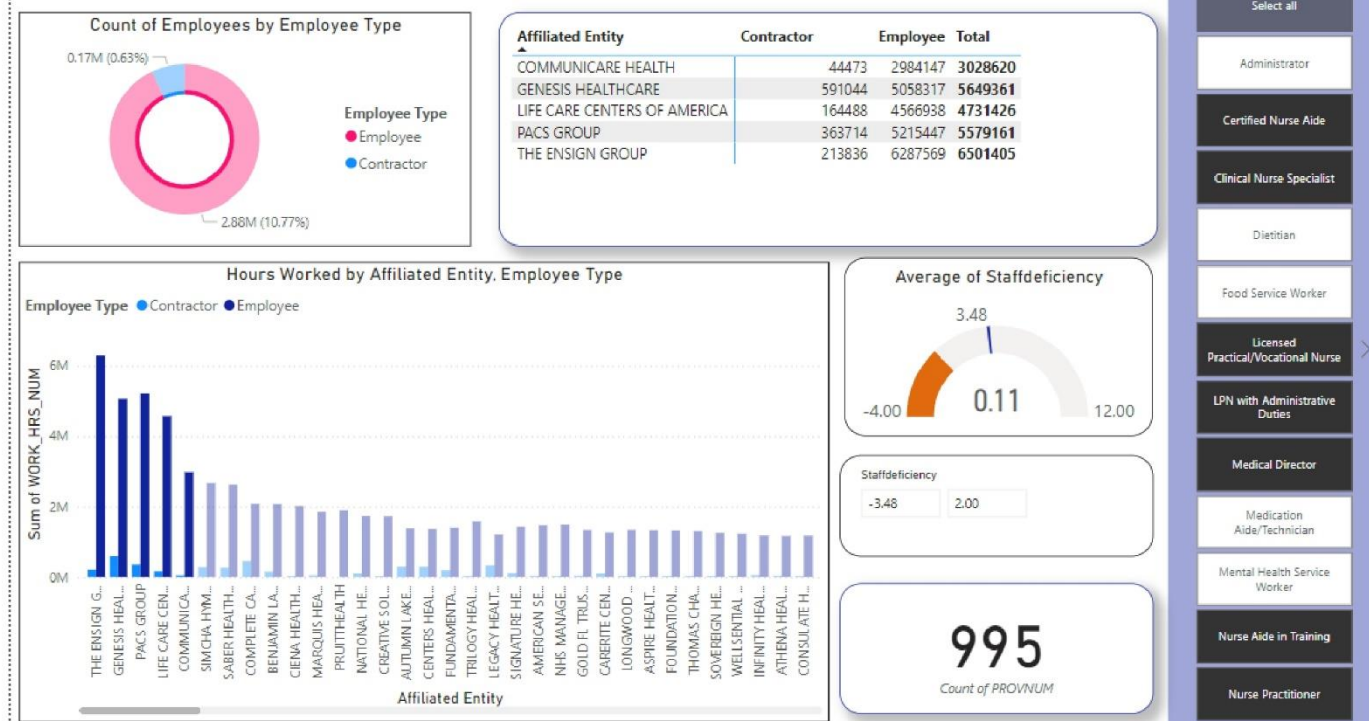


Fig.2 shows Dashboard of Contractor Vs Employee Work Hours Based on The Nursing Job Type and Top 5 Affiliated Entities with highest working Hours recorded for Q1, 2024.

Recommendation #3: Leverage High Turnover Rates for Market Penetration

Findings: High turnover rates among full-time employees in the long-term healthcare sector contribute to staffing challenges, making it harder for facilities to maintain adequate staffing levels.

Supporting Data:

Fig. 3 shows the average turnover percentages for top providers associated with A&M Healthcare Investments and Abby GL, LLC, demonstrating significant turnover issues.

Actionable Steps:

Contractors in HealthCare Industry should focus on partnering with facilities experiencing high turnover by positioning contractors as a reliable and stable staffing solution during periods of employee attrition.

Expected Outcome:

Increased contractor placements in facilities with high turnover, mitigating the negative impacts of staff attrition.

3. Employee Turnover By Affiliated Entity

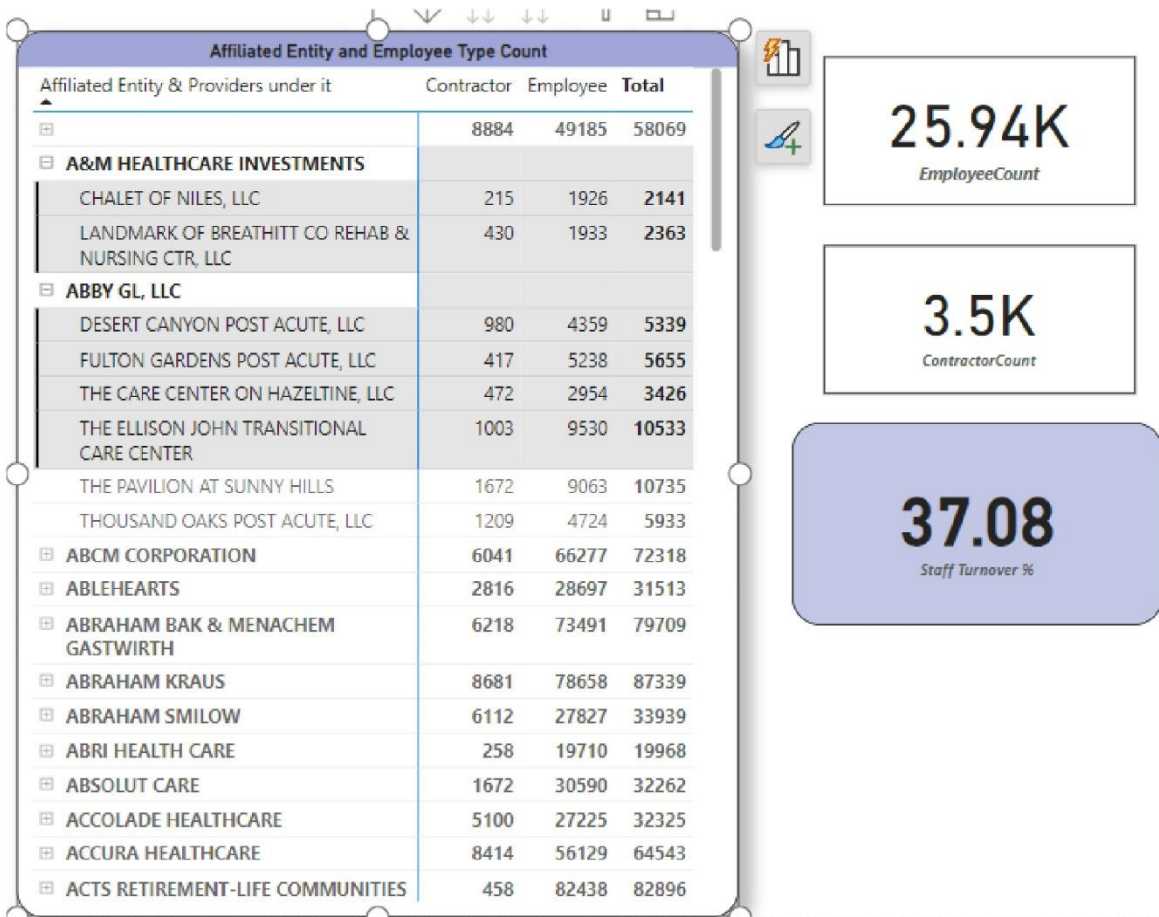


Fig. 3, shows the Average Staff Turnover Percentage for Top 5 Providers associated with the Affiliated Entities (Top 2, A&M Healthcare investments and Abby GL, LLC)

Recommendation #4: Forecasting Staff Turnover for Early Contractor Engagement

Findings:

Turnover trends indicate a gradual increase in staff attrition throughout CY 2024, especially among full-time employees. Forecasting these trends can help Contractors in HealthCare Industry anticipate staffing needs in the market.

Supporting Data:

Figs. 4-7 display projected staff turnover for each quarter of CY 2024, showing a clear increase in employee attrition rates across top providers.

Actionable Steps:

Use these forecasts to time contractor bids early, offering staffing solutions before attrition peaks.

Expected Outcome:

Contractors in HealthCare Industry gains a competitive edge by securing contractor placements in advance, preventing staffing shortages in facilities.

3. Employee Turnover By Affiliated Entity

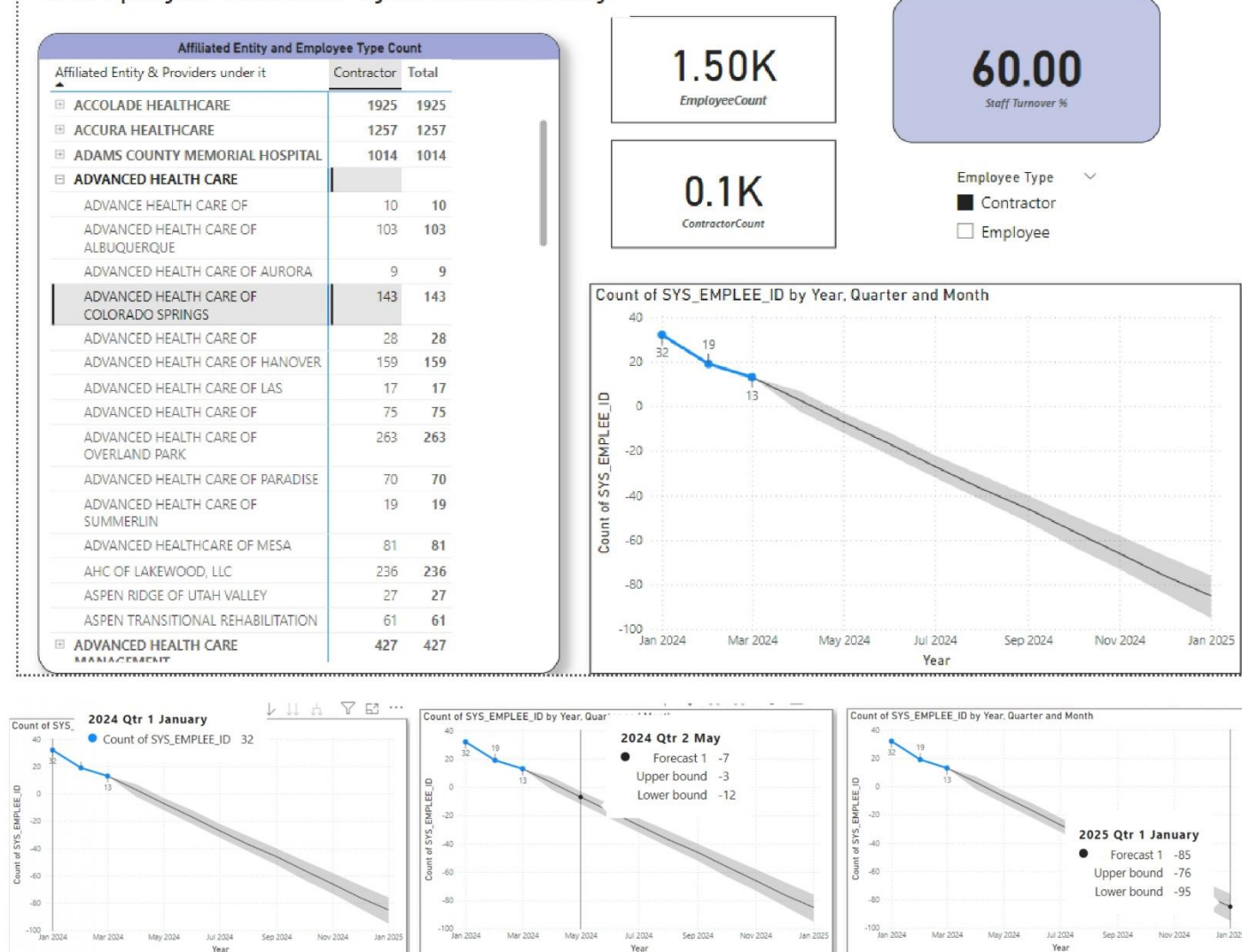


Fig. 4,5,6,7, showing gradual increase in employee turnover (decrease in number of employees) of the provider highlighted over the four quarters of CY'2024

Conclusion

This report identifies significant opportunities for Contractors in HealthCare Industry to expand its presence in the long-term healthcare provider market. By targeting understaffed centers, increasing contractor use, and leveraging high turnover rates, Contractors in HealthCare Industry can offer flexible, cost-effective staffing solutions to facilities struggling to meet staffing mandates. Forecasting turnover trends further enables Contractors in HealthCare Industry to proactively engage with potential clients, securing early bids and optimizing market penetration.

Appendix

Data Tables:

- Detailed data on staffing levels, contractor vs. full-time employee ratios, and turnover rates for top facilities and affiliated entities.

Glossary:

- **HRPD:** Hours per Resident Per Day
- **Turnover Ratio:** Percentage of staff leaving the facility during a specific period
- **CMS:** Centers for Medicare & Medicaid Services

Part 2: SQL Test

Instructions: Please write SQL queries for each of the following questions. You may assume that all tables follow typical database conventions unless otherwise specified.

Tables:

Assume you have the following tables in your database:

1. Sales

- `sales_id` (INT)
- `customer_id` (INT)
- `product_id` (INT)
- `sale_date` (DATE)
- `quantity` (INT)
- `total_amount` (DECIMAL)

2. Customers

- `customer_id` (INT)
- `customer_name` (VARCHAR)
- `sales_region` (VARCHAR)
- `sign_up_date` (DATE)

3. Products

- `product_id` (INT)
- `product_name` (VARCHAR)
- `category` (VARCHAR)
- `price` (DECIMAL)

Questions/Problem Statements To Be Answered:

1. To return the `customer_name`, `product_name`, and `total_amount` for each sale in the last 30 days.

-- Query to get customer sales and product details for the last 30 days

SELECT

 c.customer_name AS customer,
 p.product_name AS product,

```

    s.total_amount AS last_30_days_sales
FROM
    Sales s
JOIN
    Customers c ON s.customer_id = c.customer_id
JOIN
    Products p ON s.product_id = p.product_id
WHERE
    s.sale_date >= CURRENT_DATE - INTERVAL 30 DAY;

```

2. To find the total revenue generated by each product category in the last year. The output should include the product category and the total revenue for that category.

```

-- Total revenue per product category over the last year
SELECT
    p.category AS product_category,
    SUM(s.total_amount) AS total_revenue
FROM
    Sales s
JOIN
    Products p ON s.product_id = p.product_id
WHERE
    s.sale_date >= CURRENT_DATE - INTERVAL 1 YEAR
GROUP BY
    p.category;

```

3. To return all customers who made purchases in 2023 and are located in the "West" region.

```

-- Fetch distinct customers from the 'West' region for the year 2023
SELECT
    DISTINCT c.customer_name AS customer
FROM
    Sales s
JOIN
    Customers c ON s.customer_id = c.customer_id
WHERE
    c.sales_region = 'West'
    AND YEAR(s.sale_date) = 2023;

```

4. To display the total number of sales, total quantity sold, and total revenue for each customer. The result should include the `customer_name`, total sales, total quantity, and total revenue.

```

-- Summary of total sales, quantities, and revenue by customer
SELECT
    c.customer_name AS customer,
    COUNT(s.sales_id) AS total_sales,
    SUM(s.quantity) AS total_quantity,
    SUM(s.total_amount) AS total_revenue
FROM
    Sales s

```

```

JOIN
  Customers c ON s.customer_id = c.customer_id
GROUP BY
  c.customer_name;

```

5. To find the top 3 customers (by total revenue) in the year 2023.

```

-- Top 3 customers by total revenue in 2023
SELECT
  c.customer_name AS customer,
  SUM(s.total_amount) AS total_revenue
FROM
  Sales s
JOIN
  Customers c ON s.customer_id = c.customer_id
WHERE
  YEAR(s.sale_date) = 2023
GROUP BY
  c.customer_name
ORDER BY
  total_revenue DESC
LIMIT 3;

```

6. To rank products by their total sales quantity in 2023. The result should include the `product_name`, total quantity sold, and rank.

```

-- Ranking products by total quantity sold in 2023
SELECT
  p.product_name AS product,
  SUM(s.quantity) AS total_quantity_sold,
  RANK() OVER (ORDER BY SUM(s.quantity) DESC) AS product_rank
FROM
  Sales s
JOIN
  Products p ON s.product_id = p.product_id
WHERE
  YEAR(s.sale_date) = 2023
GROUP BY
  p.product_name;

```

7. Categorizing customers into "New" (if they signed up in the last 6 months) or "Existing" based on their `sign_up_date`. Include the `customer_name`, `region`, and category in the result.

```

-- Categorizing customers as 'New' or 'Existing' based on their sign-up date
SELECT
  c.customer_name AS customer,
  c.sales_region AS region,
  CASE
    WHEN c.sign_up_date >= CURRENT_DATE - INTERVAL 6 MONTH THEN 'New'
    ELSE 'Existing'

```



```

    END AS customer_category
FROM
    Customers c;

```

8. To return the month and year along with the total sales for each month for the last 12 months.

```

-- Monthly total sales for the last 12 months
SELECT
    DATE_FORMAT(s.sale_date, '%Y-%m') AS month_year,
    SUM(s.total_amount) AS total_sales
FROM
    Sales s
WHERE
    s.sale_date >= CURRENT_DATE - INTERVAL 12 MONTH
GROUP BY
    DATE_FORMAT(s.sale_date, '%Y-%m')
ORDER BY
    month_year;

```

9. To return the product categories that generated more than \$50,000 in revenue during the last 6 months.

```

-- Total revenue per product category over the last 6 months, filtered by revenue > 50,000
SELECT
    p.category AS product_category,
    SUM(s.total_amount) AS total_revenue
FROM
    Sales s
JOIN
    Products p ON s.product_id = p.product_id
WHERE
    s.sale_date >= CURRENT_DATE - INTERVAL 6 MONTH
GROUP BY
    p.category
HAVING
    total_revenue > 50000;

```

10. To check for any sales where the `total_amount` doesn't match the expected value (i.e., `quantity * price`).

```

-- Find sales with mismatches between total amount and expected calculated amount
SELECT
    s.sales_id AS sales_id,
    s.quantity AS quantity_sold,
    p.price AS unit_price,
    s.total_amount AS recorded_total_amount,
    (s.quantity * p.price) AS expected_total_amount
FROM
    Sales s
JOIN
    Products p ON s.product_id = p.product_id

```

WHERE

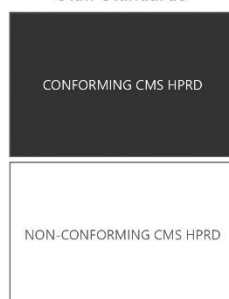
$s.total_amount \neq (s.quantity * p.price);$

** THE POWER BI ETL AND VISUALIZATION DATA AVAILABLE AS A .pbix FILE TYPE, I HAVE ATTACHED THE EXPORTED PDF BELOW. **

1. Target Understaffed Facilities

CMS Certification Number (CCN)	Provider Name	Reported Total Nurse Staffing Hours per Resident per Day	Staffdeficiency
165225	CENTERVILLE SPECIALTY CARE	3.48	0.00
155086	WOODLAND MANOR	3.48	0.00
675338	MILL CREEK	3.48	0.00
225529	LIFE CARE CENTER OF THE NORTH SHORE	3.48	0.00
225349	WINDSOR NURSING & RETIREMENT HOME	3.48	0.00
345553	AUTUMN CARE OF FAYETTEVILLE	3.48	0.00
235225	FOUNTAIN VIEW OF MONROE	3.48	0.00
165314	LAMONI SPECIALTY CARE	3.48	0.00
185272	RIVER HAVEN NURSING AND REHABILITATION CENTER	3.48	0.00
365341	BRIARWOOD VILLAGE	3.48	0.00
145304	ELEVATE CARE RIVERWOODS	3.48	0.00
155556	WATERS OF TIPTON SKILLED NURSING FACILITY, THE	3.48	0.00
146019	WABASH SENIOR LIVING & REHAB	3.48	0.00
105808	THE PAVILION AT CRESCENT LAKE	3.48	0.00
495398	DINWIDDIE HEALTH AND REHAB CENTER	3.48	0.00
175344	SANDPIPER HEALTHCARE & REHABILITATION CENTER	3.48	0.00
345227	CYPRESS VALLEY CNTR FOR NURSING AND REHABILITATION	3.48	0.00
475012	MOUNTAIN VIEW CENTER GENESIS HEALTHCARE	3.48	0.00

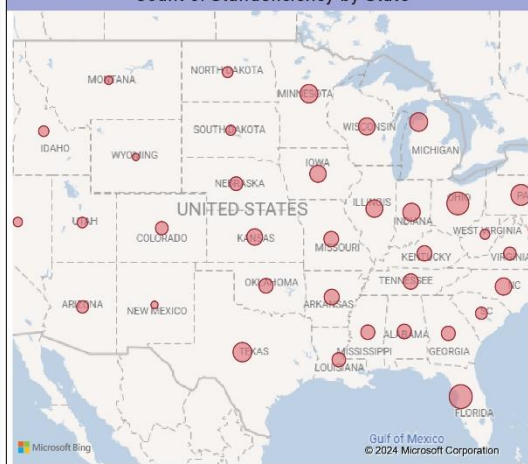
Staff Standards



Sum of Staffdeficiency



Count of Staffdeficiency by State



Affiliated Entity Name

A&M HEALTHCARE INVESTMENTS

ABBY GL, LLC

ABCM CORPORATION

ABLEHEARTS

ABRAHAM BAK & MENACHEM GASTWIRTH

ABRAHAM KRAUS

ABRAHAM SMILOW

ABRI HEALTH CARE

ABSOLUT CARE

ACCOLADE HEALTHCARE

ACCURA HEALTHCARE

ACTS RETIREMENT-LIFE COMMUNITIES

ADAMS COUNTY MEMORIAL HOSPITAL

ADVANCED HEALTH CARE

ADVANCED HEALTH CARE MANAGEMENT

ADVANCED HEALTHCARE SOLUTIONS

ADVENTIST HEALTH

ADVINIACARE

AHAVA HEALTHCARE

AHMC HEALTHCARE

AJC HEALTHCARE

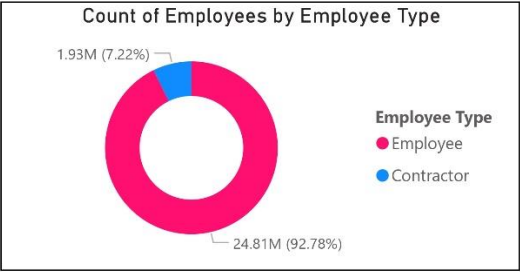
AKIKO IKE

ALARIS HEALTH

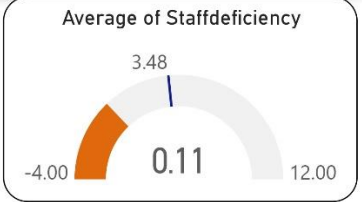
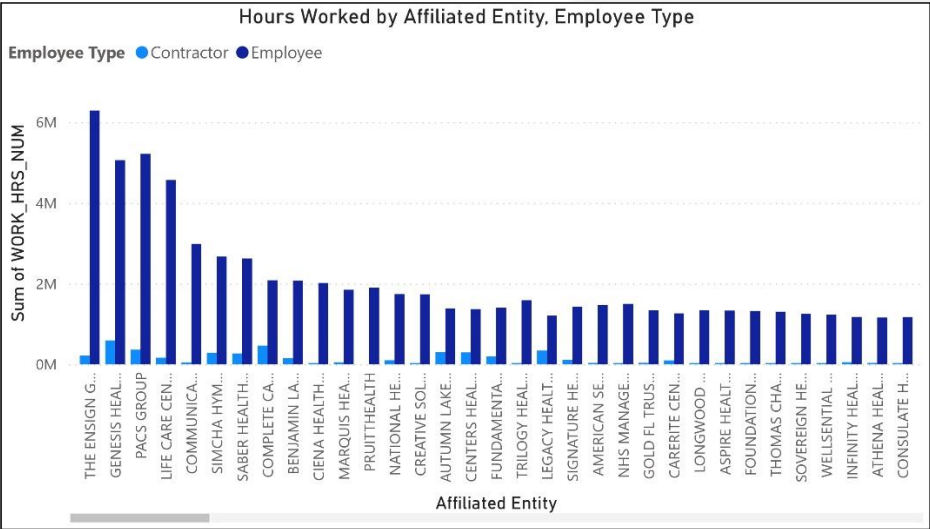
ALIYA HEALTHCARE

ALLAIRE HEALTH

2. Nursing Homes with Low Contractor Usage



Affiliated Entity	Contractor	Employee	Total
A&M HEALTHCARE INVESTMENTS	35	25228	25263
ABBY GL, LLC	5907	229787	235694
ABCM CORPORATION	1647	341356	343003
ABLEHEARTS	15551	159370	174921
ABRAHAM BAK & MENACHEM GASTWIRTH	3288	444370	447658
ABRAHAM KRAUS	59331	426768	486099
ABRAHAM SMILOW	34128	146116	180244
ABRI HEALTH CARE	148	114870	115018



Job Type

Select all

- Administrator
- Certified Nurse Aide
- Clinical Nurse Specialist
- Dietitian
- Food Service Worker
- Licensed Practical/Vocational Nurse
- LPN with Administrative Duties
- Medical Director
- Medication Aide/Technician
- Mental Health Service Worker
- Nurse Aide in Training
- Nurse Practitioner

3. Employee Turnover By Affiliated Entity

Affiliated Entity and Employee Type Count		
Affiliated Entity & Providers under it	Contractor	Total
⊕	4970	4970
⊕ A&M HEALTHCARE INVESTMENTS	11	11
⊕ ABBY GL, LLC	1108	1108
⊕ ABCM CORPORATION	280	280
⊕ ABLEHEARTS	2379	2379
⊕ ABRAHAM BAK & MENACHEM GASTWIRTH	492	492
⊕ ABRAHAM KRAUS	7760	7760
⊕ ABRAHAM SMILOW	5098	5098
⊕ ABRI HEALTH CARE	5	5
⊕ ABSOLUT CARE	1479	1479
⊕ ACCOLADE HEALTHCARE	1925	1925
⊕ ACCURA HEALTHCARE	1257	1257
⊕ ADAMS COUNTY MEMORIAL HOSPITAL	1014	1014
⊕ ADVANCED HEALTH CARE		
ADVANCE HEALTH CARE OF	10	10
ADVANCED HEALTH CARE OF ALBUQUERQUE	103	103
ADVANCED HEALTH CARE OF AURORA	9	9
ADVANCED HEALTH CARE OF COLORADO SPRINGS	143	143
ADVANCED HEALTH CARE OF	28	28
ADVANCED HEALTH CARE OF HANOVER	159	159
ADVANCED HEALTH CARE OF LAS	17	17



Employee Type

Contractor

Employee

