# **Nursing and Non-Nursing Contract Staffing Ratio Report**

## **1. Overview & Key Observations**

### **Key Findings:**

* **Nursing contract staffing ratios** are consistently **low** (~6-8%) across most facilities, indicating that **most nurses are full-time employees**.
* **Non-nursing contract staffing ratios** are significantly **higher** (~18-27%) and show **weekly fluctuations**, peaking on **Mondays** and dipping over weekends.
* A significant **anomaly** occurred on **June 1, 2024**, where multiple facilities reported **100% non-nursing contract staff usage** while nursing contract ratios remained near zero.

### **Variable Definitions:**

* **nursing\_ratio** = nurse\_directcare\_ctrnurse\_directcare\_emp+nurse\_directcare\_ctr\frac{nurse\\_directcare\\_ctr}{nurse\\_directcare\\_emp + nurse\\_directcare\\_ctr}
* **non\_nursing\_ratio** = non\_nurse\_ctrnon\_nurse\_emp+non\_nurse\_ctr\frac{non\\_nurse\\_ctr}{non\\_nurse\\_emp + non\\_nurse\\_ctr}

## **2. Statistical Distribution & Outliers**

### **Nursing Contract Hours Summary**

* **Mean:** ~1,946 contract hours per facility
* **Standard Deviation:** 4,270 hours
* **Median:** 144 hours (suggesting most facilities use **minimal contract nursing**)
* **Max:** 73,472 hours (indicating some facilities rely heavily on contract nurses)

### **Non-Nursing Contract Hours Summary**

* **Mean:** ~5,260 contract hours per facility
* **Standard Deviation:** 8,710 hours
* **Median:** 3,215 hours
* **Max:** 128,490 hours (suggesting a high reliance on contract workers in some facilities)

### **Outliers**

* **25% of facilities report ZERO contract nursing hours**, while others rely on contract nurses for **up to 25% of total staffing**.
* **Extreme values (nursing\_ratio > 0.5)** occur in **less than 1% of facilities**, indicating a few locations are heavily dependent on contract nurses.
* **The June 1, 2024, spike (100% non-nursing contract usage) is highly unusual** and requires further investigation.

## **3. Facility-Level Analysis**

### **Patterns in Nursing vs. Non-Nursing Staffing**

* Facilities are either **employee-dominant** (low contract usage) or **contract-dependent**, with few showing a balanced mix.
* Higher nursing contract ratios are correlated with **higher overall facility staffing levels** but not necessarily with lower employee hours.
* **Top facilities by contract staffing ratio:**
  + **Facility 015076:** 19.47% nursing contract ratio
  + **Facility 015113:** 23.12% nursing contract ratio
  + **Facility 015075:** 24.69% nursing contract ratio
  + **Facility 015032:** 100% non-nursing contract ratio (June 1 outlier)

## **4. Time-Series Analysis**

### **Weekly Trends**

* **Nursing contract staffing** rises on **weekends (Saturday & Sunday)**, indicating possible shift-based hiring or weekend staff shortages.
* **Non-nursing contract staffing** drops significantly on weekends but **spikes on Mondays**, suggesting a payroll or contract structure that favors weekday hiring.

### **June 1, 2024, Anomaly**

* **Multiple facilities reported 100% contract non-nursing staff.**
* **Potential Causes:**
  + **Data misclassification** (permanent employees mistakenly logged as contract workers)
  + **Payroll cycle adjustment** (end-of-month staffing changes)
  + **Operational shift** (seasonal hiring, regulatory change, or vendor contract shifts)
* **Next Steps:** Review facility-level data from previous Saturdays to check for similar patterns.

## **5. Key Insights & Recommendations**

### **Insights**

1. **Stable Nursing Staffing Model**
   * Most facilities use **employee-based nursing models** with **minimal reliance on contract staff**.
   * Facilities that use contract nurses tend to **maintain that model consistently**.
2. **High Non-Nursing Contract Dependence**
   * Non-nursing roles rely **far more on contract workers**, particularly for **administrative, therapy, and social work staff**.
   * The weekly pattern suggests **flexible labor scheduling** based on demand.
3. **Potential Payroll or Data Issues on June 1st**
   * The **100% non-nursing contract ratio** anomaly on **June 1, 2024**, needs further validation.
   * If confirmed as an error, data cleaning is necessary before modeling staffing trends.

## **6. Conclusion**

Our analysis confirms that **nursing contract staffing is minimal** in most facilities, while **non-nursing contract staffing is substantial and cyclical**. The **June 1st anomaly** needs further investigation, as it may be **a data error or an operational shift**. Future research should integrate **cost, penalty, and ownership data** to determine if contract-heavy facilities face additional challenges.

**Next Steps:**

* Validate the June 1, 2024, data.
* Investigate cost implications of contract-heavy facilities.
* Track future anomalies in contract staffing patterns.
* Segment facilities by staffing models and financial outcomes.