



Impact of Seasonal Turnover in Nursing Homes on Patient Health Outcomes

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Background

- **More than 200,000 nursing home residents have died due to COVID-19 - accounts for 23% of the national COVID death toll (KFF 2022)**
 - Underscores the deeper, systemic weakness that exist in institutional care settings in the US
- **Nursing home worker turnover is associated with poor health outcomes among residents**
 - Median annual nursing home worker turnover is 94% (Gandhi 2021)
 - Levers to reduce turnover exist: 10% increase in wages reduces turnover by 3-4% (Ruffini 2020)
- **Gap exists in whether a causal link between worker turnover and resident health outcomes exists**
 - This evidence can help guide policymakers towards reform that supports wellbeing for residents and workers

Objective

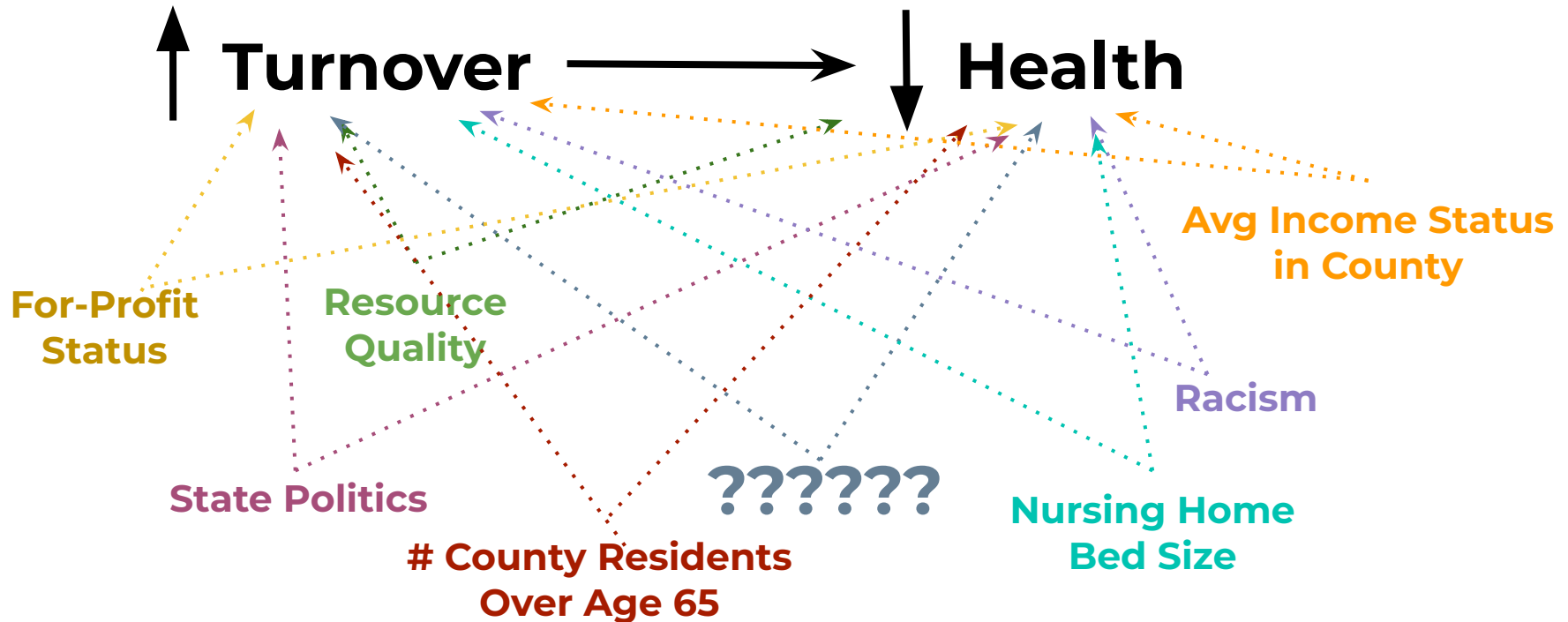
Explore the causal link between CNA worker turnover and resident health outcomes in nursing homes



Why is this hard?

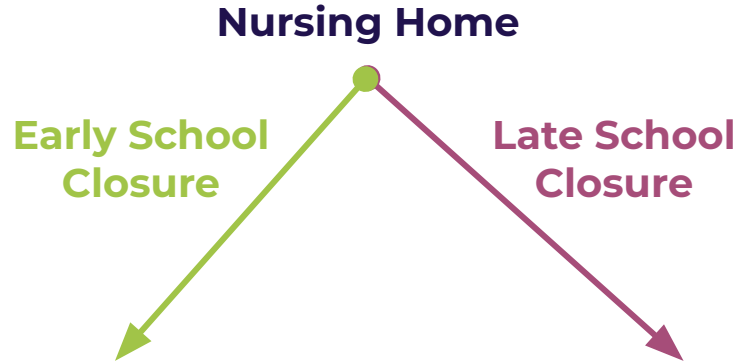


Why is this hard?



Methods: Instrumental Variable (IV)

Instrument

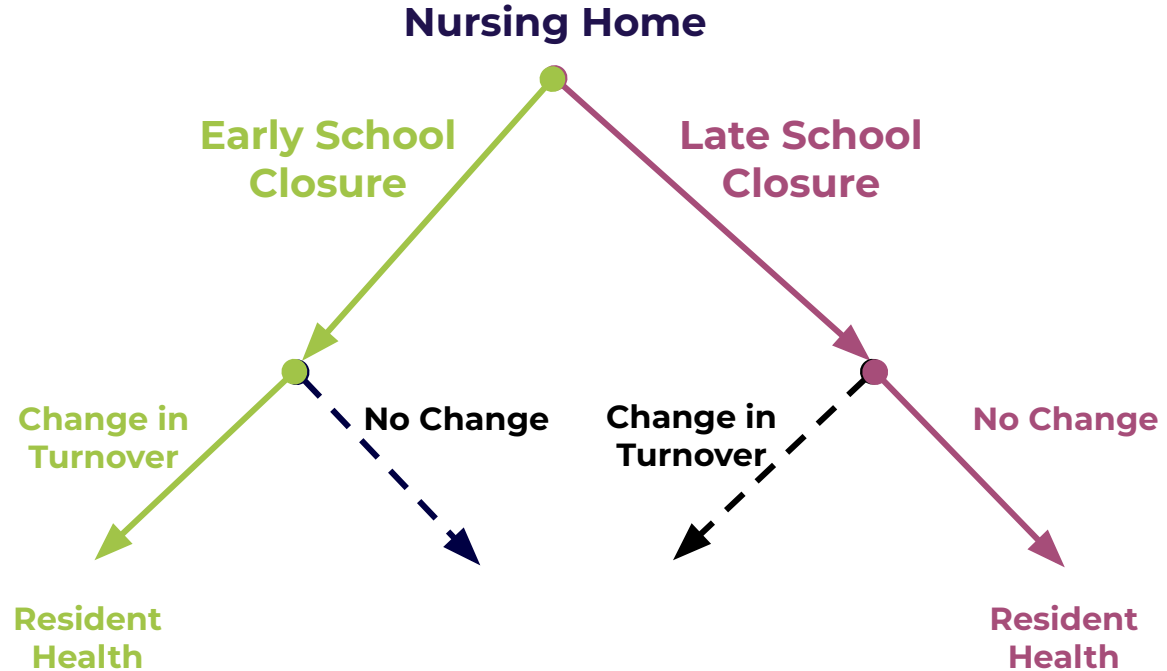


Methods: Instrumental Variable (IV)

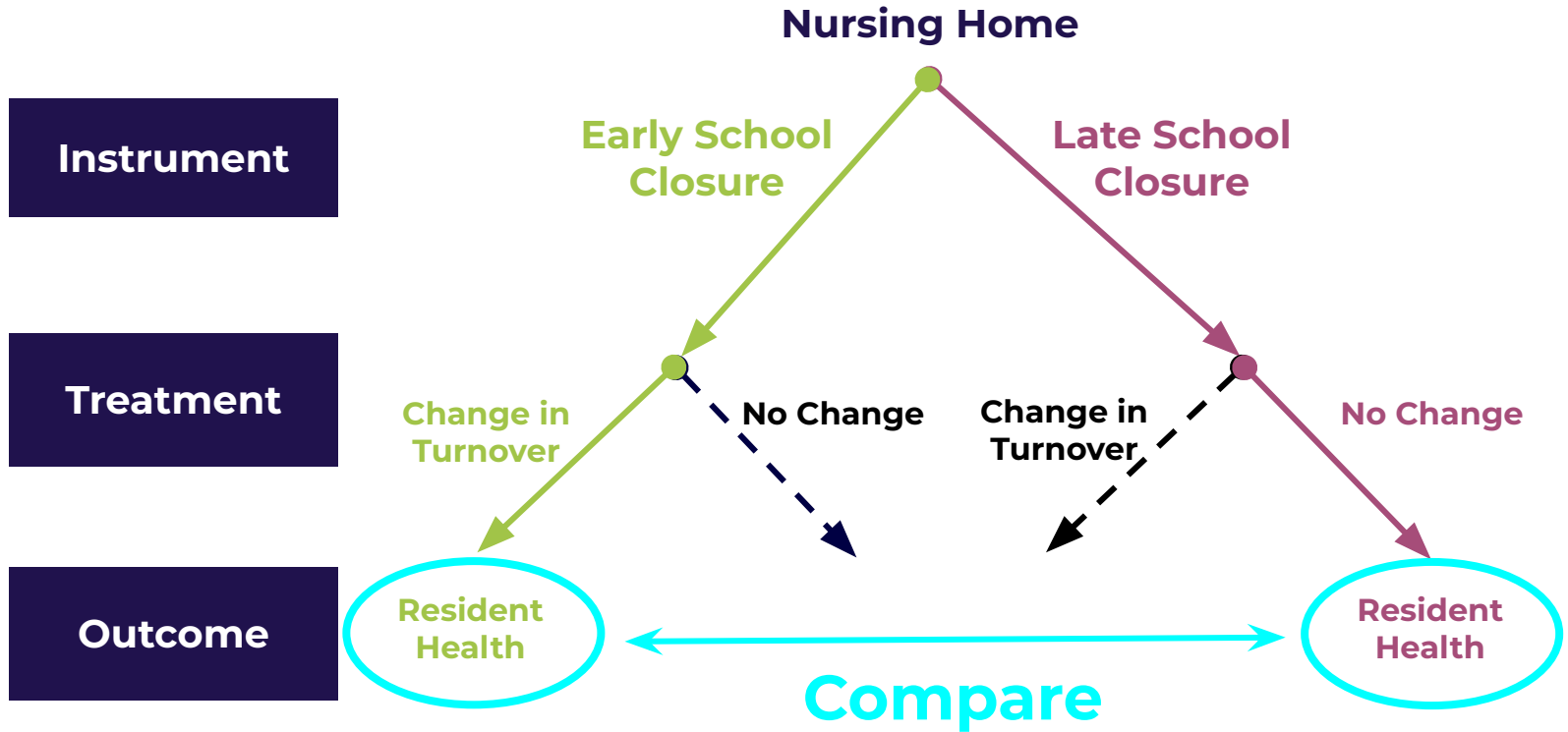
Instrument

Treatment

Outcome



Methods: Instrumental Variable (IV)



(Price and Wasserman 2022; US Bureau of Labor Statistics 2021)

Data Sources

PBJ (Payroll Based Journal)

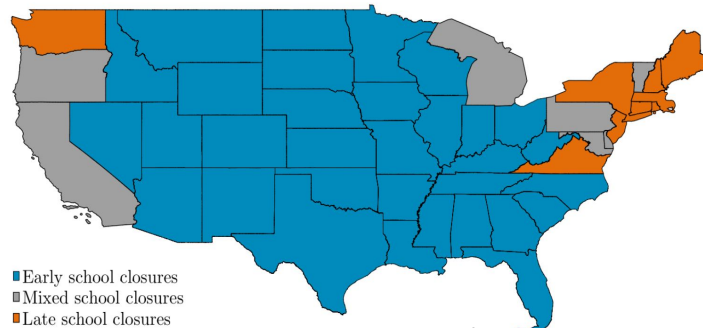
- Centers for Medicare and Medicaid Services
- Logs of CNA work logs by nursing home
- Oct 2016 - Sep 2021

LTC Focus (Long-Term Care Focus)
AHRF (Area Health Resource File)
Nursing Home Compare

- Characteristics of each nursing home
- Used to control for confounding factors

School Closure Data

Appendix Figure A.6: Classification of US states by the timing of K-12 school closures



(Price and Wasserman 2022)

Monthly Turnover

Traditional

Separated Workers

Total Workers

Monthly Turnover

Traditional

$$\frac{\text{\# Separated Workers}}{\text{Total Workers}}$$

Weighted

$$\text{Sum for each separated worker} \left[\begin{array}{c} \% \text{ total hours} \\ \text{worked in final} \\ \text{month} \end{array} \right]$$

Monthly Turnover

Traditional

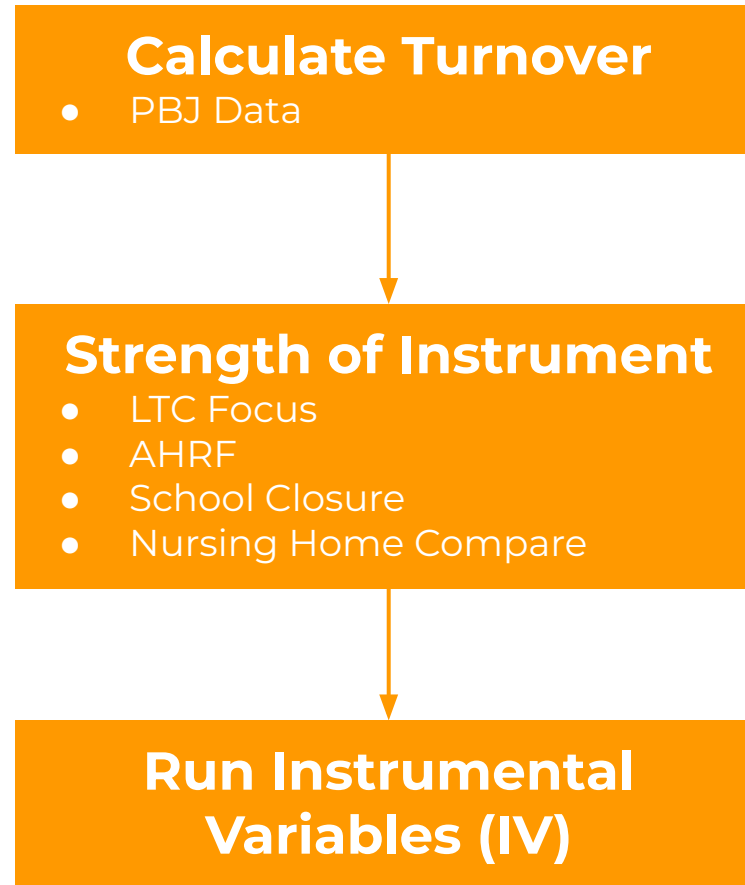
$$\frac{\text{\# Separated Workers}}{\text{Total Workers}}$$

Weighted

$$\text{Sum for each separated worker} \left[\begin{array}{c} \% \text{ total hours} \\ \text{worked in final} \\ \text{month} \end{array} \right]$$

Compute for each facility and month

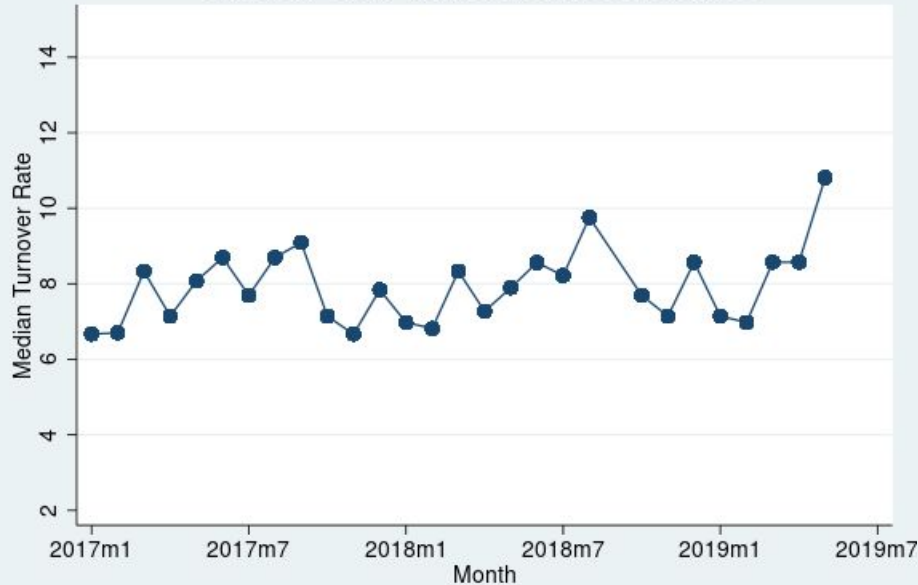
Methods Overview



Median Turnover Rates Over Time

- Median CNA turnover is about 8% per month [traditional]; Using the weighted metrics, turnover drops to about 4%
- Consistent with story that nursing homes have significantly high turnover rates
- Concerned that cyclical increase in turnover is due to quarterly reporting errors

Median CNA Turnover Across Facilities



Traditional

Median Weighted CNA Turnover

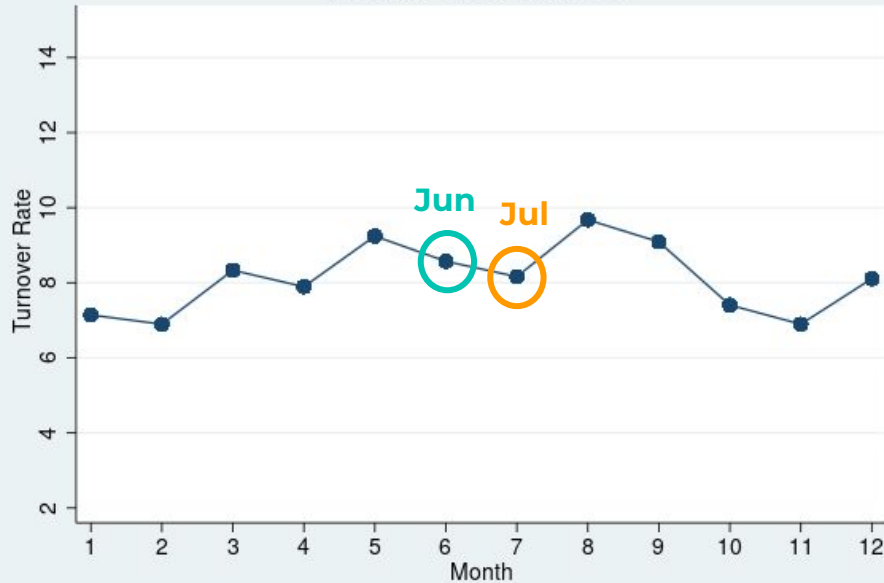


Weighted

Turnover Rates Aggregated By Month

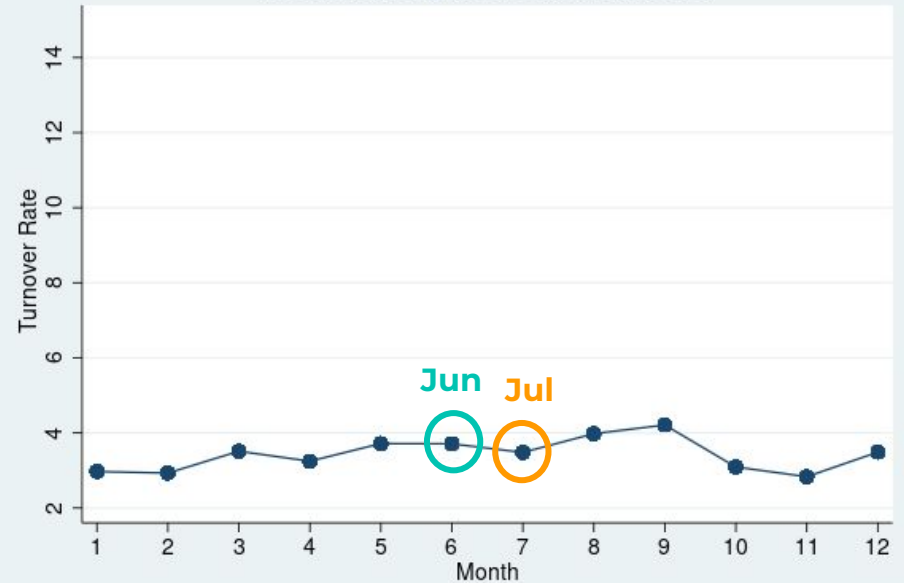
- Shows fluctuation in turnover by month for any given year
- Traditional turnover increases at the start and end of summer
- Doesn't clearly demonstrate whether time of the year predicts turnover

Median CNA Turnover



Traditional

Median Weighted CNA Turnover

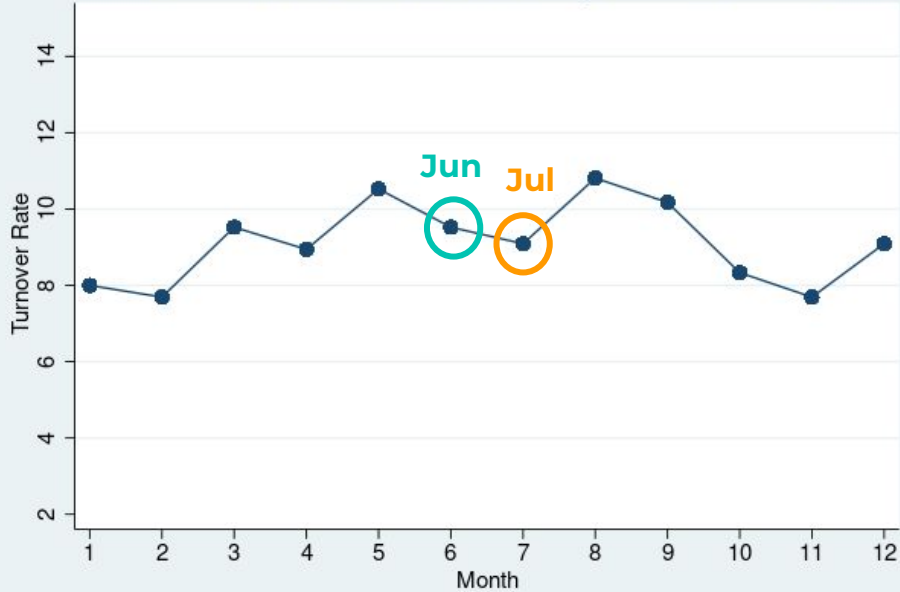


Weighted

Traditional Turnover Rates by Closure Status

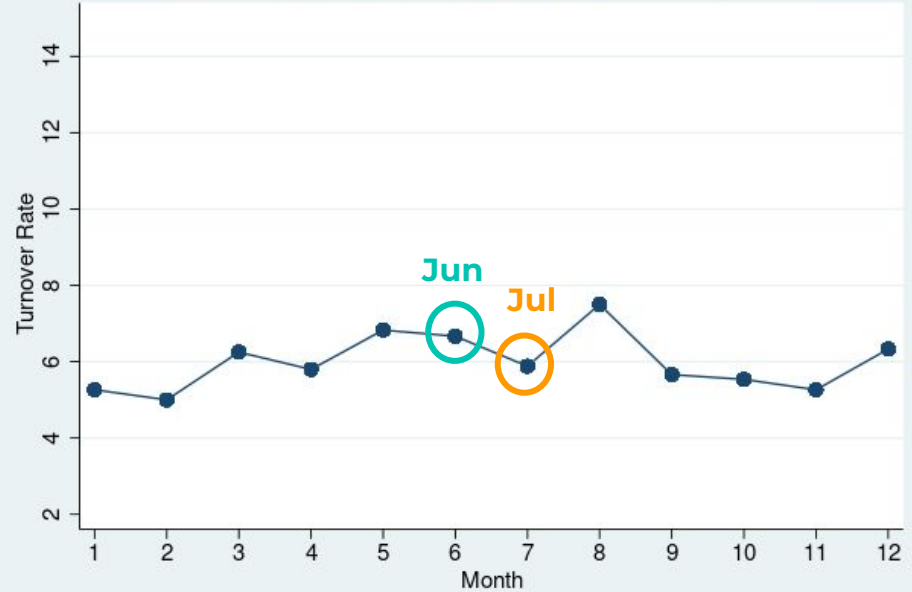
- We further separated the data based on facilities in early versus late closure states
- We observe differences in levels of turnover but the trend between the two is similar, which is unexpected

Median CNA Turnover in Early Closure States



Early

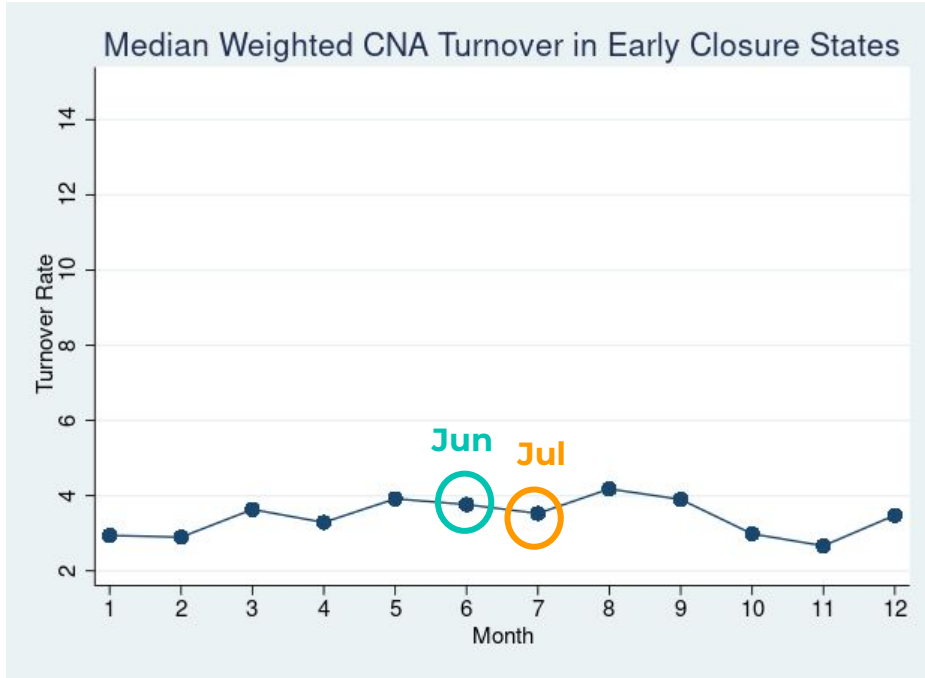
Median CNA Turnover in Late Closure States



Late

Weighted Turnover Rates by Closure Status

- Similar observations occur using the weighted turnover



Early



Late

Future Steps

Calculate Turnover

- PBJ Data

Strength of Instrument

- LTC Focus
- AHRF
- School Closure
- Nursing Home Compare

Run Instrumental Variables

Considerations

1. CMS data limitations
2. Instrument might not be strong

Lessons Learned

1. Not being afraid
2. Mentorship

Acknowledgements

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Questions?

LTC Focus

The website hosts data regarding the health and functional status of nursing home residents, characteristics of care facilities, state policies relevant to long term care services and financing, and data characterizing the markets in which facilities exist and, in the future, we plan to expand to include information about other sectors of the long-term care system. These data will allow researchers to examine the relationship between state policies and local market forces and the quality of long-term care.

Over 300 variables including:

Bed size

Demographics

Vaccinations

Patient Admit Types

Insurance Types

Worker Ratios