

# The Effect of COVID-19 Vaccinating Health Professionals Prior to Patients

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## Abstract

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## I. INTRODUCTION

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## II. METHODS

### I. Model Methods

General process of how the guys created the model. What they chose as parameters, why they chose specific set-up/ structure etc.

- software used
- Thought process, planning
- architecture of model chosen and why
- how/why parameters were chosen
- optimization methods
- 1-D model set up
- 2-D model set up

### II. Data Analysis Methods

Process and methods used to gather and then analyze the data. How we ruled out factors, how we ruled in factors, process of elimination etc.

\*A thank you or further information

- Where is data from
- How we got it
- Pipeline analysis set-up
- types of plots generated
- Analysis after plots– how we determined "significance" in event analysis
- What constitutes ruling in a parameter; ruling out a parameter
- What constitutes a likely conclusion

### III. RESULTS

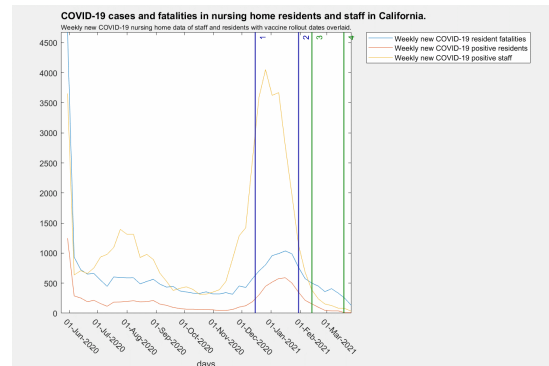
#### I. Model Results

##### I.1 Jake's Model Results

##### I.2 Ethan's Model Results

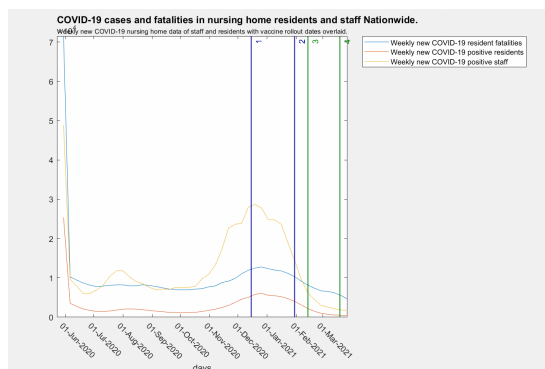
#### II. Data Analysis Results

#### II.2 State-Level Data Analysis Results

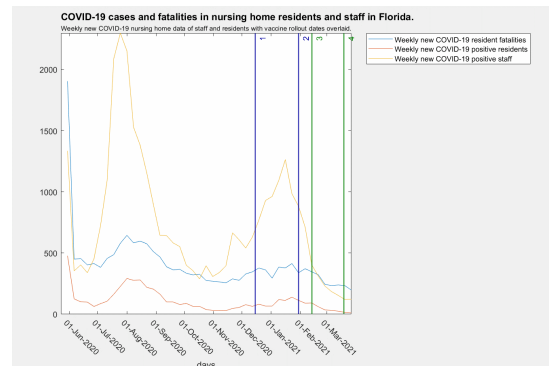


**Figure 2:** Roughly 2 weeks after release of the first COVID-19 vaccine, new COVID-19 cases in nursing home staff in California begins to decline, followed by a reduction in COVID-19 cases and fatalities in residents approximately 2 weeks later.

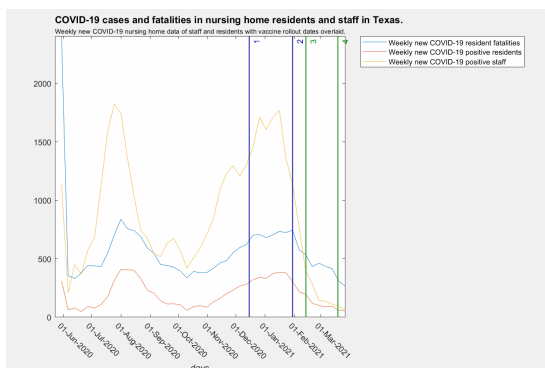
#### II.1 National-Level Data Analysis Results



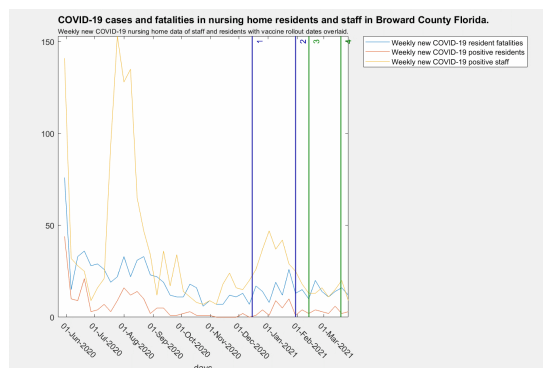
**Figure 1:** The distribution of the first COVID-19 vaccine immediately reduced new COVID-19 cases in nursing home staff Nationwide, followed by a similar reduction in nursing home residents approximately 2 weeks later.



**Figure 3:** Approximately 4 weeks after the distribution of the first COVID-19 vaccine, new COVID-19 cases in nursing home staff in Florida begin to decline, and COVID-19 cases and fatalities in nursing home residents remained constant for nearly 3 months after the first wave of vaccine distributions before declining.



**Figure 4:** Approximately 4 weeks after the release of the first COVID-19 vaccine, new COVID-19 cases in nursing home staff in Texas began to decline, followed by a decline in COVID-19 cases and fatalities in nursing home residents approximately 1 week later.

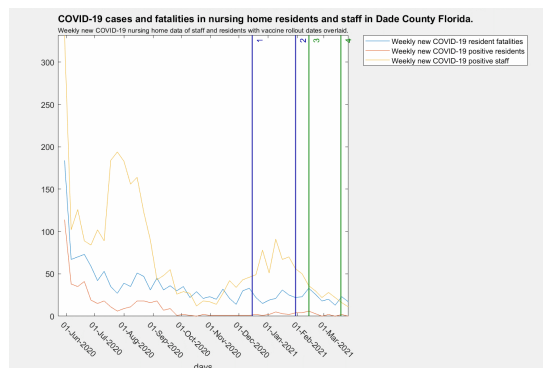


**Figure 6:** Approximately 2 weeks after COVID-19 vaccine distribution begins, new COVID-19 cases in nursing home staff begin to decline in Broward County Florida, while COVID-19 cases and fatalities in nursing home residents remain constant, displaying no change.

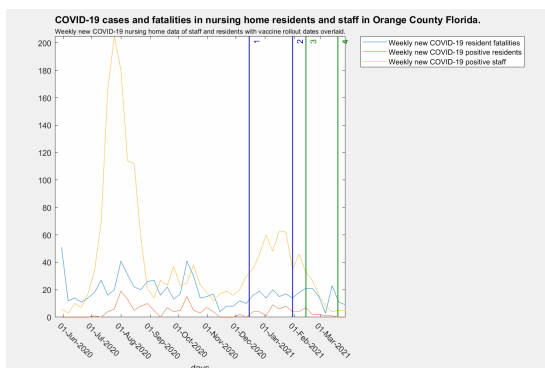
## II.3 County-Level Data Analysis Results



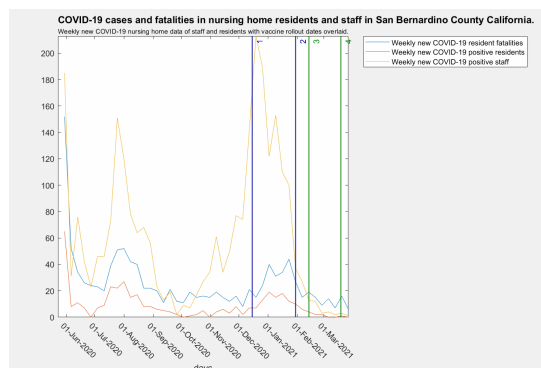
**Figure 5**



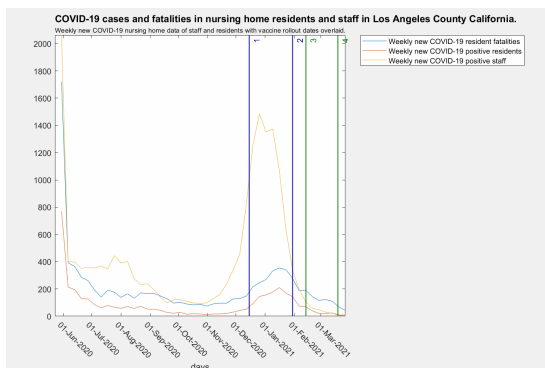
**Figure 7:** Nearly 4 weeks after COVID-19 vaccine distribution begins, new COVID-19 cases in nursing home staff begin to decline in Dade County Florida, while COVID-19 cases and fatalities in nursing home residents remain constant with a slight display in decline approximately 1 month after staff decline.



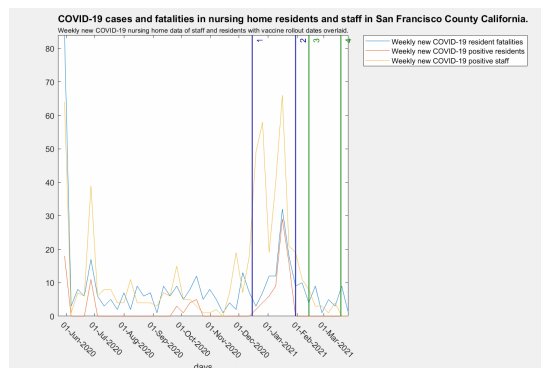
**Figure 8:** Approximately 5 weeks after the start of COVID-19 vaccine distribution, new COVID-19 cases in nursing home staff begin to decline in Orange County, Florida, while COVID-19 cases and fatalities in nursing home residents decline approximately 1 month after staff decline.



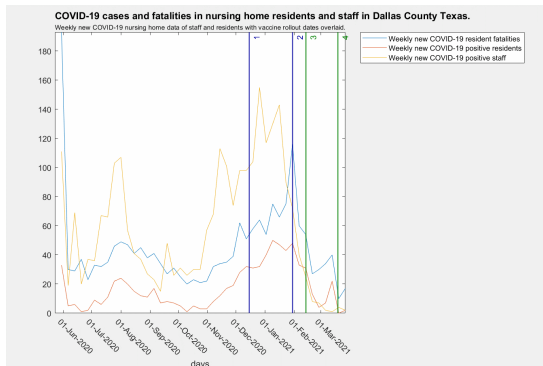
**Figure 10:** The release of the first COVID-19 vaccine is followed by a reduction in new COVID-19 cases in nursing home staff in San Bernardino County, California within 3 weeks, followed by a decline in COVID-19 cases and fatalities in nursing home staff approximately 1 week later.



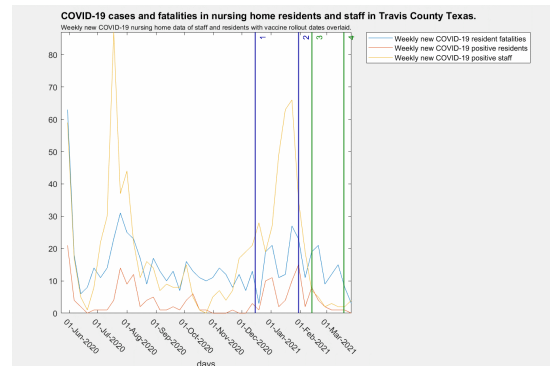
**Figure 9:** The release of the first COVID-19 vaccine is followed by a reduction in new COVID-19 cases in nursing home staff in Los Angeles County, California approximately 3 weeks after distribution; succeeded by a reduction in COVID-19 cases and fatalities in nursing home residents approximately 1 week later.



**Figure 11:** Approximately 4 weeks after the distribution of the first COVID-19 vaccine, new COVID-19 cases in nursing home staff in San Francisco County, California begin to decline, followed by a decline in COVID-19 cases and fatalities in nursing home residents less than one week later.

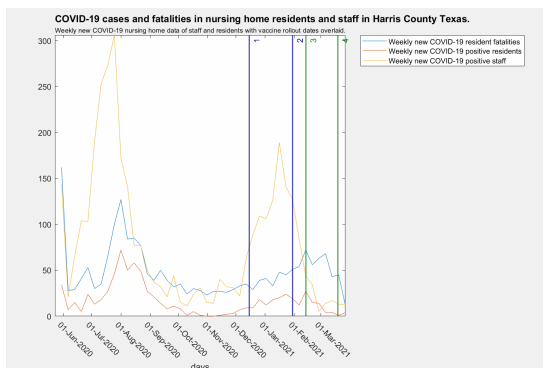


**Figure 12:** New COVID-19 cases in nursing home staff in Dallas County, Texas begin to decline approximately 4 weeks after the distribution of the first COVID-19 vaccine, followed by the decline in COVID-19 cases and fatalities in nursing home residents approximately 2 weeks later.

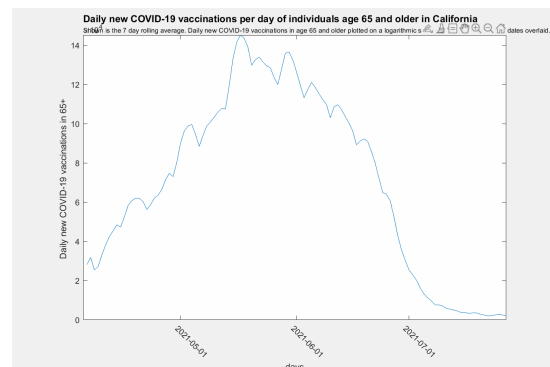


**Figure 14:** New COVID-19 cases in nursing home staff in Travis County, Texas begin to decline approximately 5 weeks after the distribution of the first COVID-19 vaccine, followed by the decline in COVID-19 cases and fatalities in nursing home residents approximately 2 weeks later.

### III. Vaccinations in general public 65+ and in assisted living facility residents



**Figure 13:** New COVID-19 cases in nursing home staff in Harris County, Texas begin to decline approximately 5 weeks after the distribution of the first COVID-19 vaccine, followed by the decline in COVID-19 cases and fatalities in nursing home residents approximately 2 weeks later.



**Figure 15**

### IV. Nursing Home Statistics

1. Histogram w/ scatterplot
2. Pie Chart?
3. Graph chart for comparison?

#### IV. DISCUSSION

##### I. Model Discussion

1. Jake's model
2. Ethan's model

##### II. Event Analysis Discussion

The effectiveness of vaccinating the population against COVID-19 is undeniably positive, and is apparent through the decline in the presence of COVID-19 within the nursing home setting at the National, State, and County level.

1. Nationwide has declined
2. California & Texas have declined; Florida residents remain constant– weird.

3. by the time 80-90% of first dose has been delivered, everyone is at low levels for COVID-19 in nursing home
4. health professionals are vectors
5. vaccinating health professionals first, and earlier saves lives faster
- 6.

#### REFERENCES

- [Figueredo and Wolf, 2009] Figueredo, A. J. and Wolf, P. S. A. (2009). Assortative pairing and life history strategy - a cross-cultural study. *Human Nature*, 20:317–330.