

# Vaccine Equity Group 1

**Sponsor:** BU Spark!

**Client:** Dr. Julia Koehler

Leland Ling, Kristi Li, Brian Tao, Yu Yan



# **Link to Presentation Video (Google Drive Link)**

<https://drive.google.com/drive/folders/1uhhE9Vfb0krBmlLahcwcDLfvMWaMiNOD>



# Goals and Background

## Goals

- To find disparities within vaccination rollout within the communities of Everett, Springfield, Newton, Wellesley, Chelsea, and Revere
  - Whether wealthier regions have access before poorer regions
- To find if Grassroots Organizations have significant impact to vaccination rollout

## Background needed:

- Less represented minority groups generally get the shorthand of the stick
- La Colaborativa has been working in Chelsea since the beginning of Covid, supporting their community. We want to see what kind of effect visually they have on vaccination rollout.
- Scope of looking at both age data and racial data is too large, we are focused on racial data - Group 2 is looking at age data.



# Dataset Preliminary Analysis and Data manipulation

Using T test, we found that the data between cities and races is significantly different as p value significantly lower than 0.05 when comparing them to each other.

Earlier times are missing 2 booster vaccinations

booster is not out yet - so no change as of now, need to consider these time periods as completely separate

Older times: missing partially vaccinated

Filled out with one dose - fully vaccinated

Missing infant data for most times

Filled out missing data as 0

In the County/City Age, the partially\_vaccinated data of Wellesley city from line 2396 to 2403 seems to be shifted up by one row, so we shifted them down by one row.



# Timeline

We split up the timeline into 5 parts - early, mid, late vaccine rollout, booster one rollout, booster two rollout.

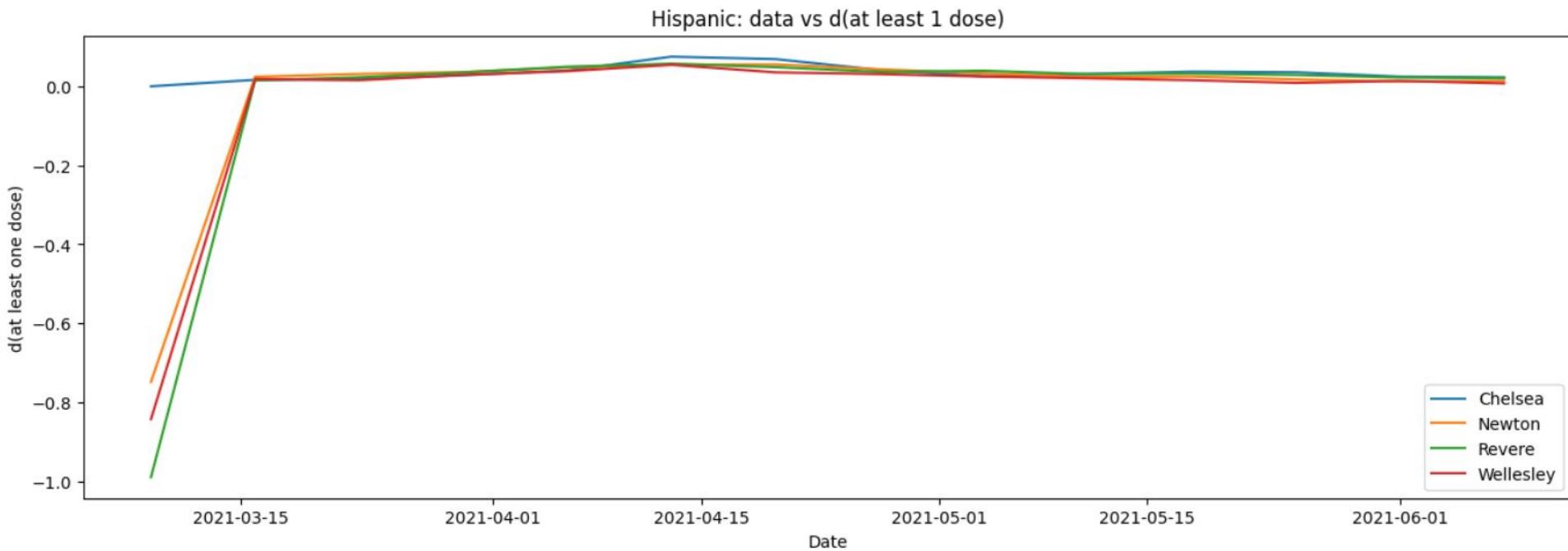
Early mid and late vaccine rollout time intervals were calculated by splitting the timeline from the beginning of the data to booster one rollout into thirds.

Booster one rollout ends when booster two rollout begins.

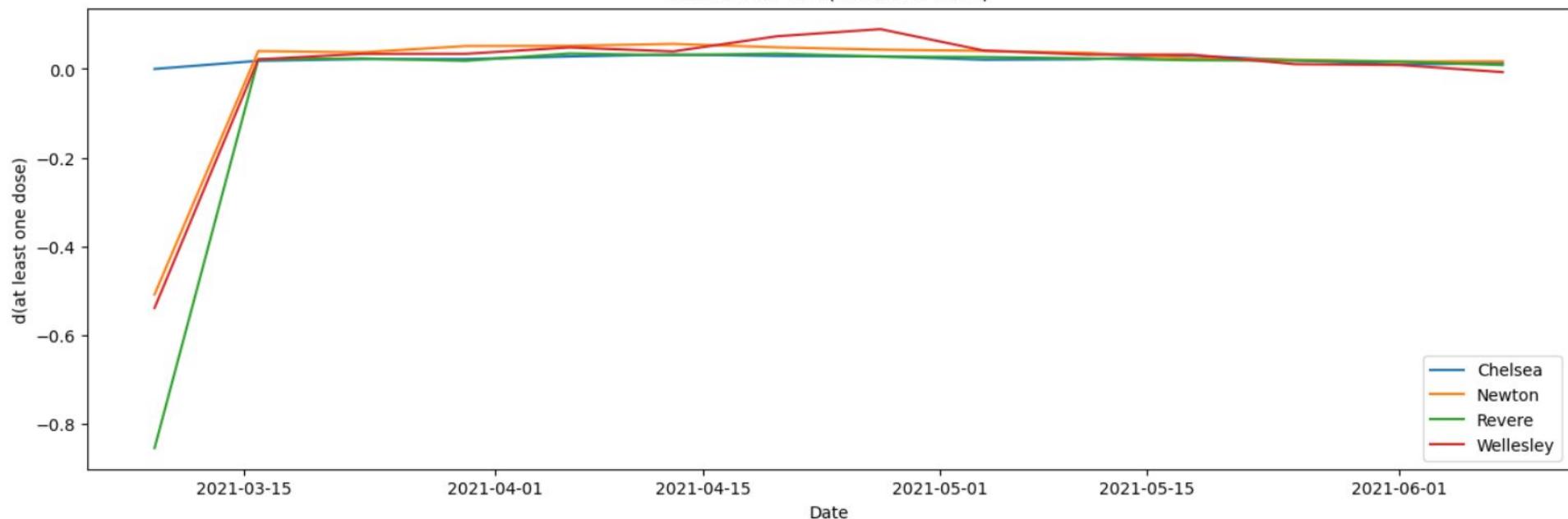
# **Data vs. Rate of At Least 1 Dose by Region**

Each line corresponds to a region, and each graph corresponds to a race.

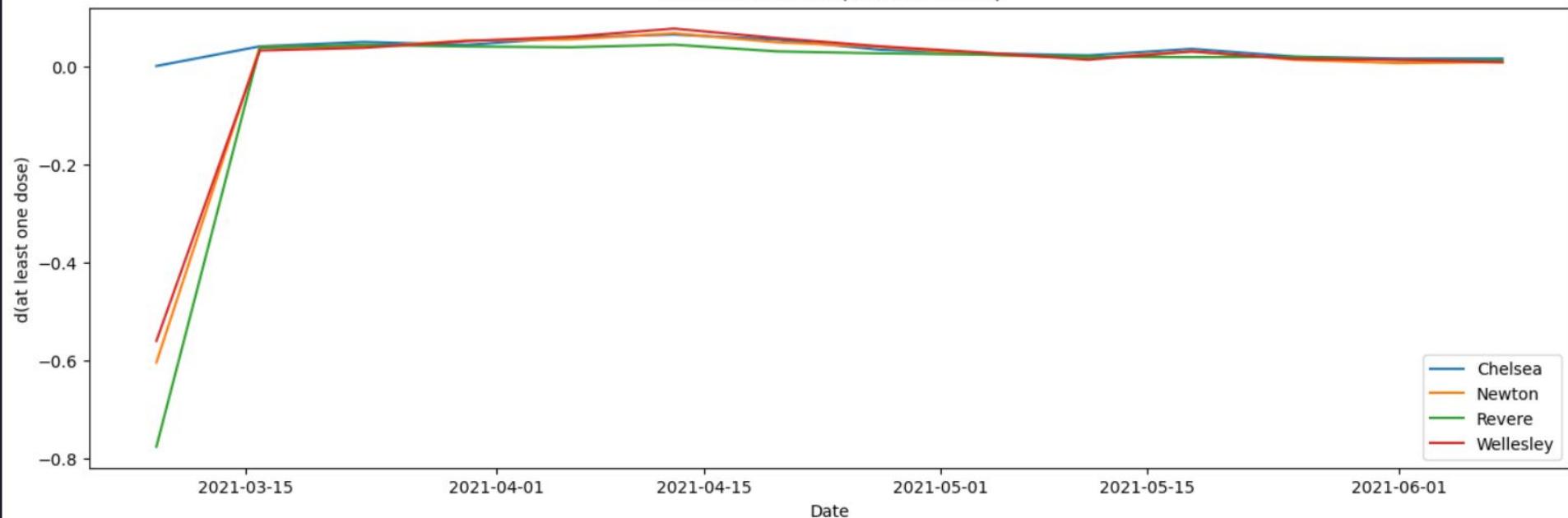
# Early Vaccine Rollout



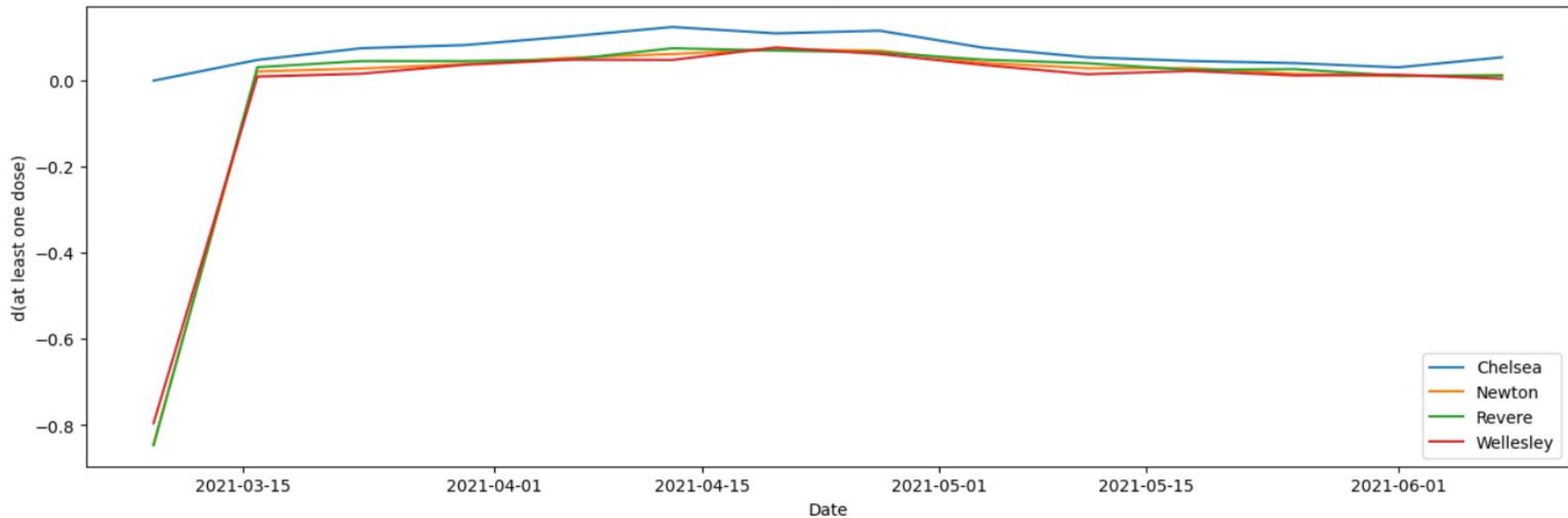
Black: data vs  $d(\text{at least 1 dose})$



Causian: data vs  $d(\text{at least 1 dose})$

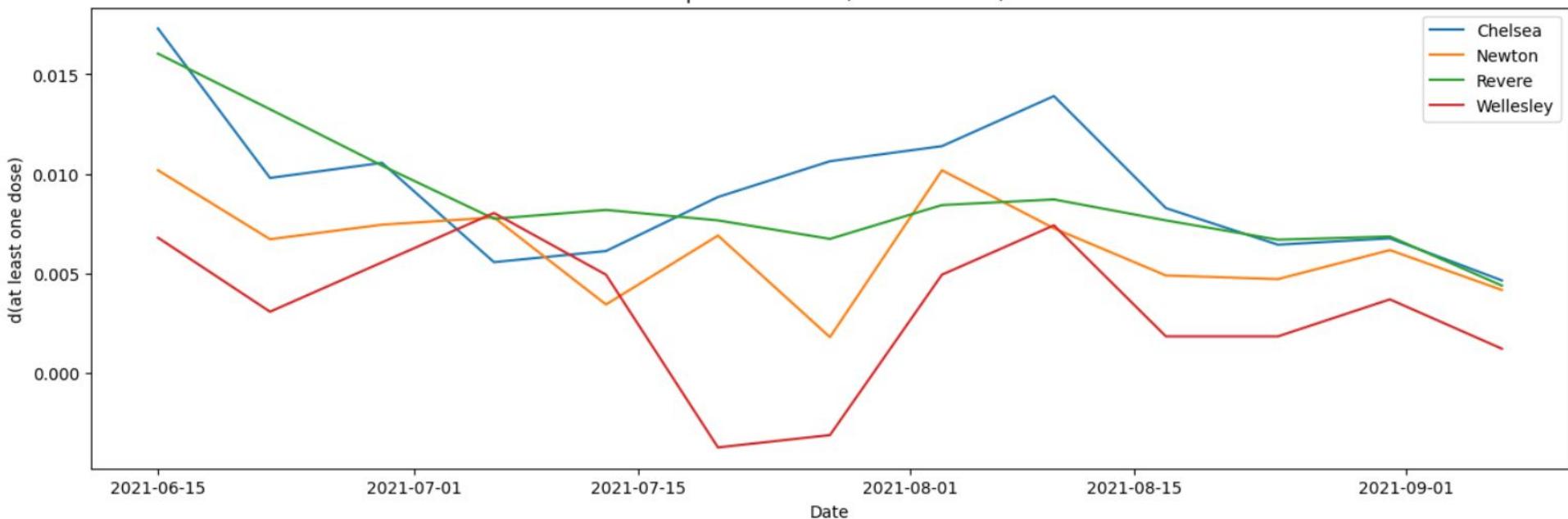


Asian: data vs  $d(\text{at least 1 dose})$

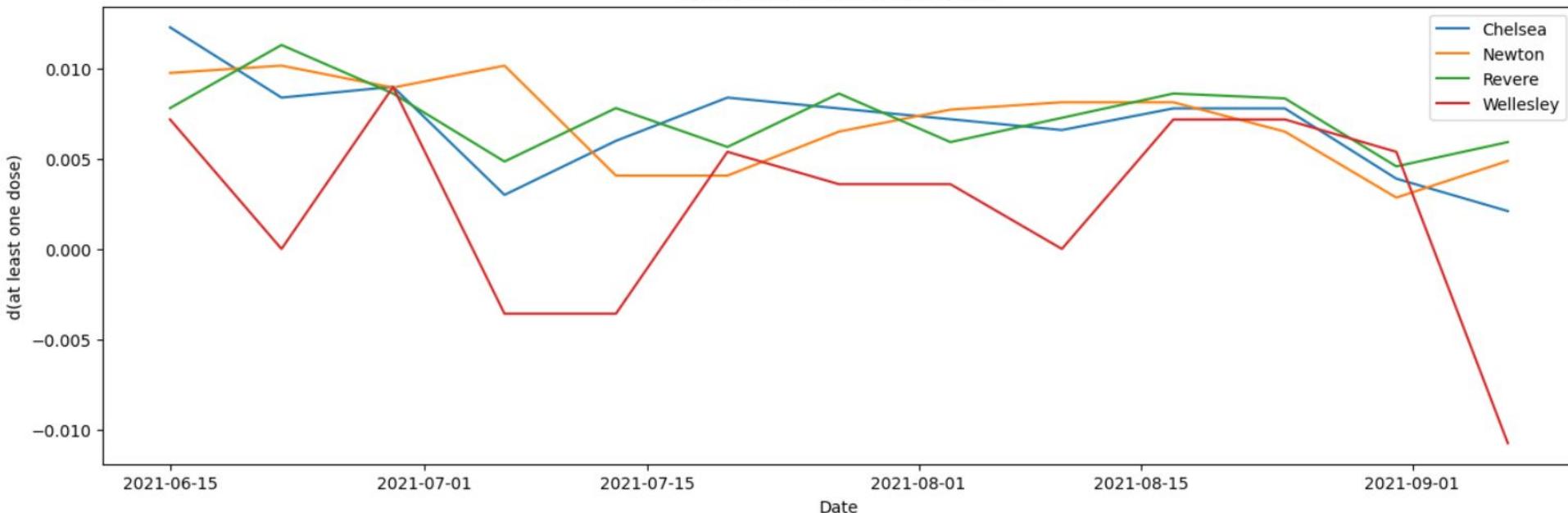


# Middle Vaccine Rollout

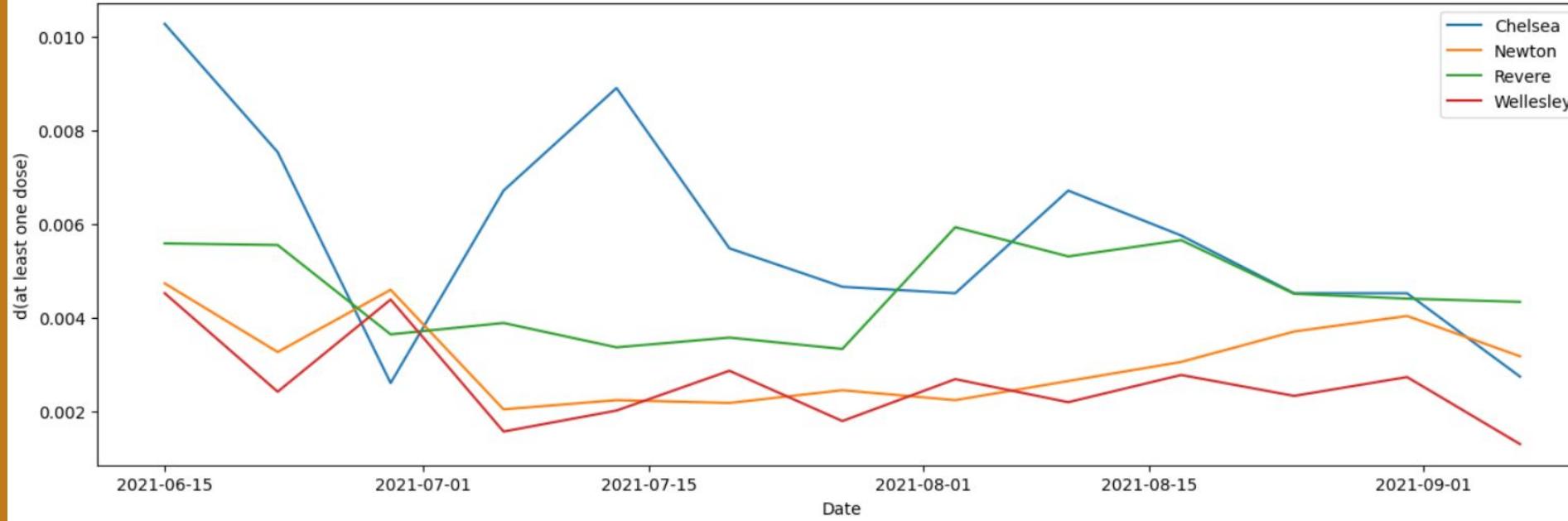
Hispanic: data vs  $d(\text{at least 1 dose})$



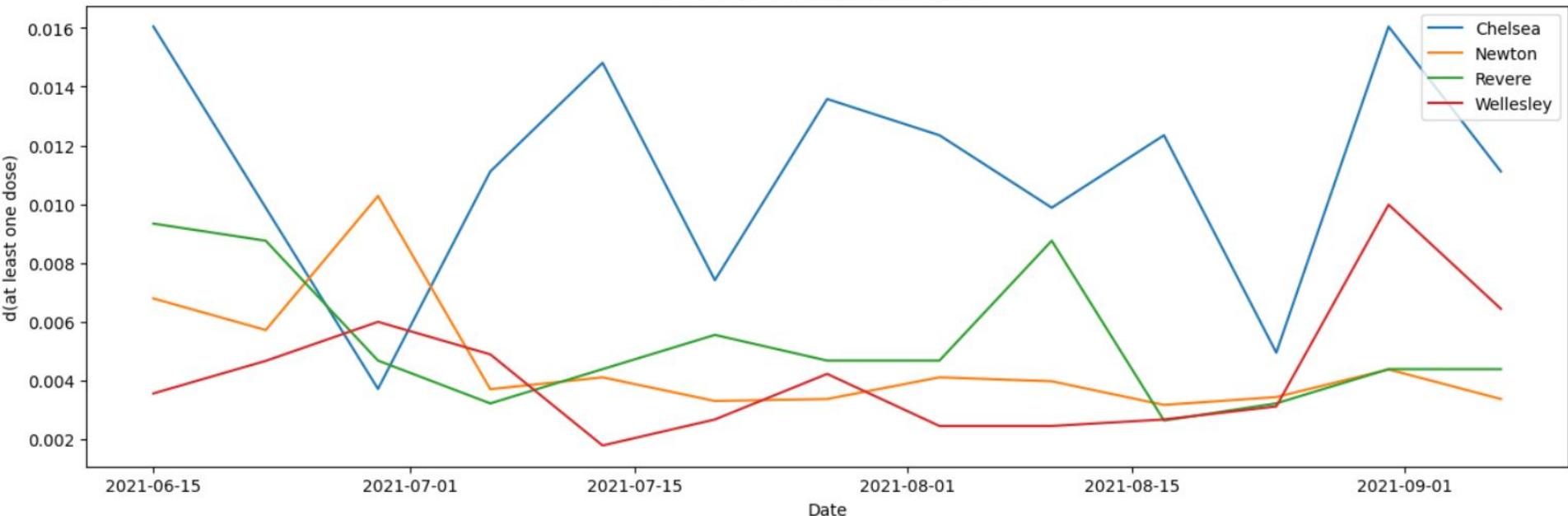
Black: data vs d(at least 1 dose)



Causian: data vs  $d(\text{at least 1 dose})$

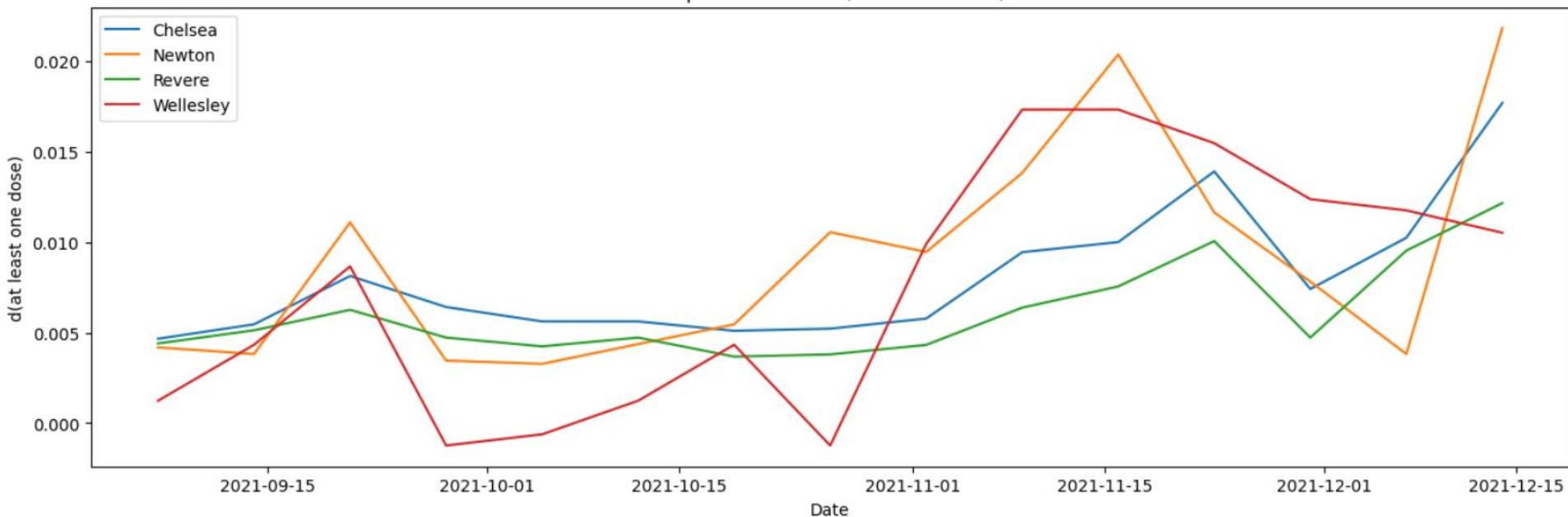


Asian: data vs  $d(\text{at least 1 dose})$

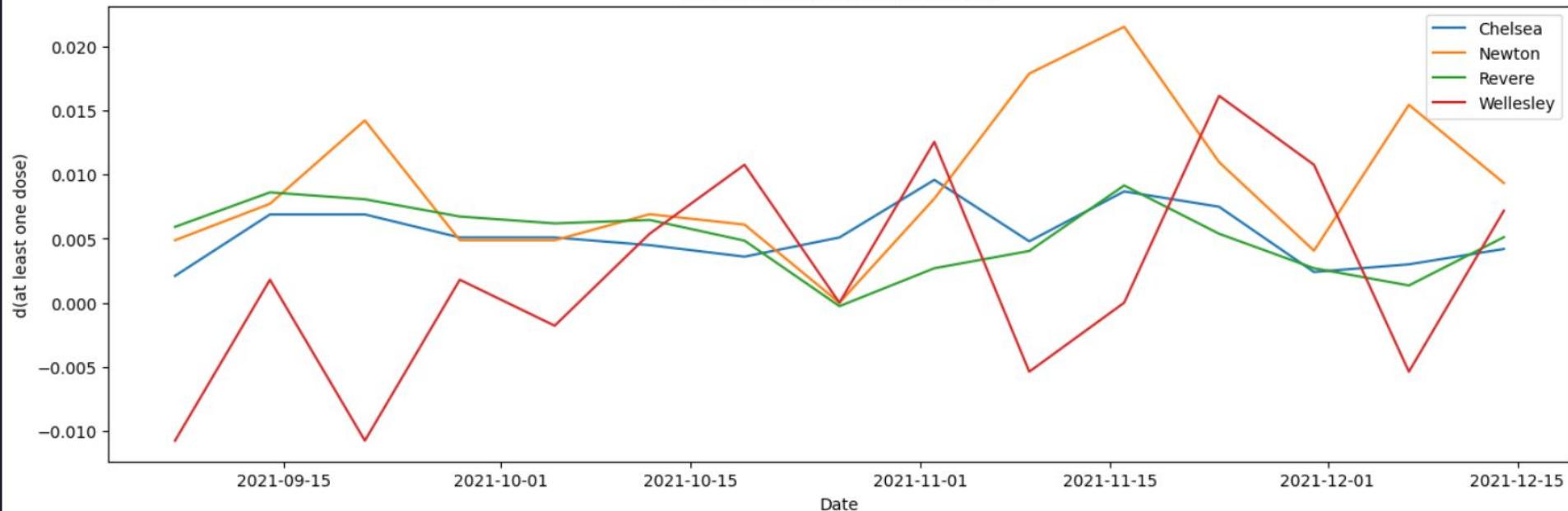


# Late Vaccine Rollout

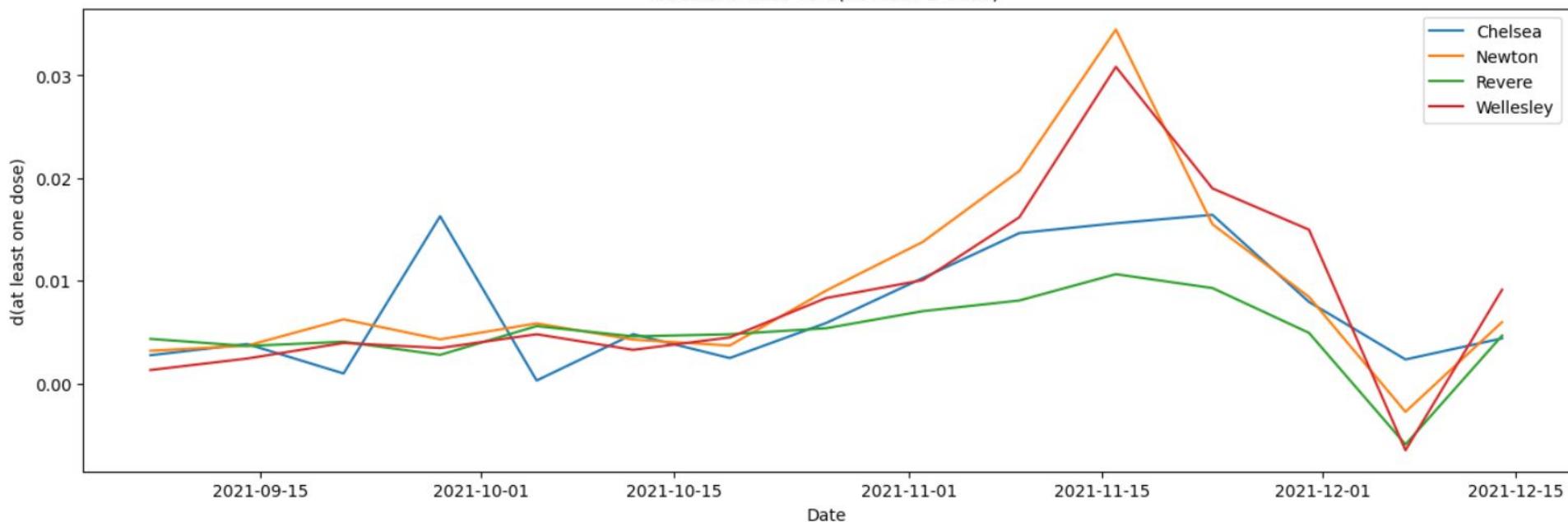
Hispanic: data vs  $d(\text{at least 1 dose})$



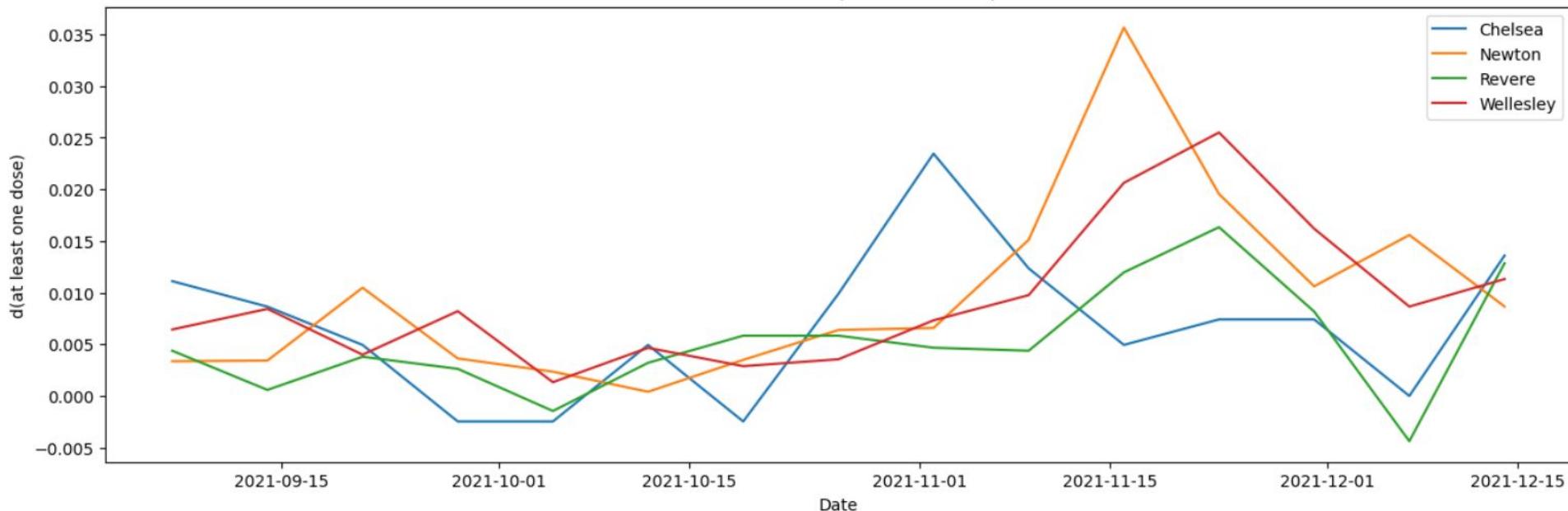
Black: data vs d(at least 1 dose)



Causian: data vs  $d(\text{at least 1 dose})$

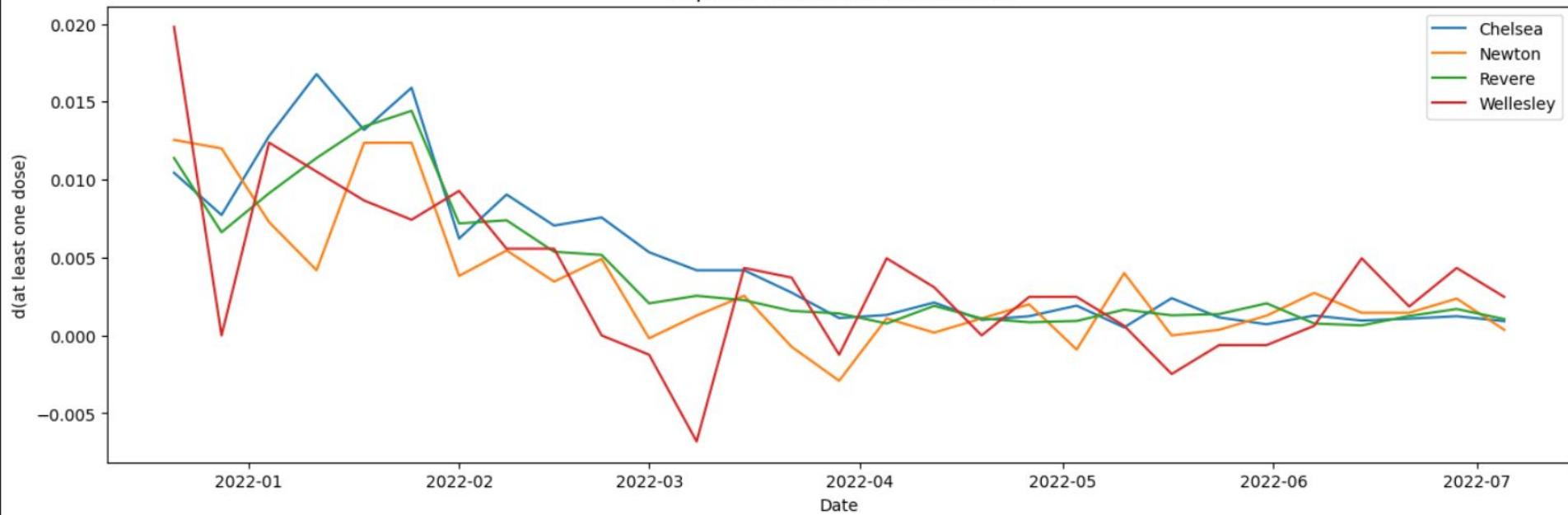


Asian: data vs  $d(\text{at least 1 dose})$

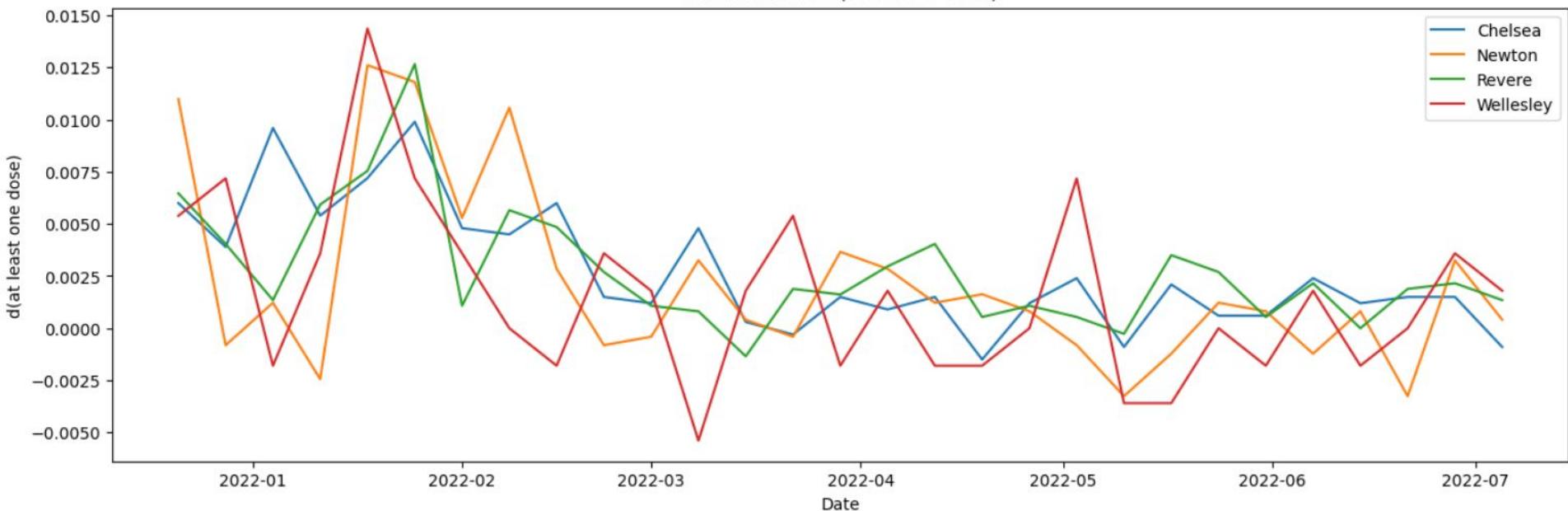


# Booster 1 Rollout

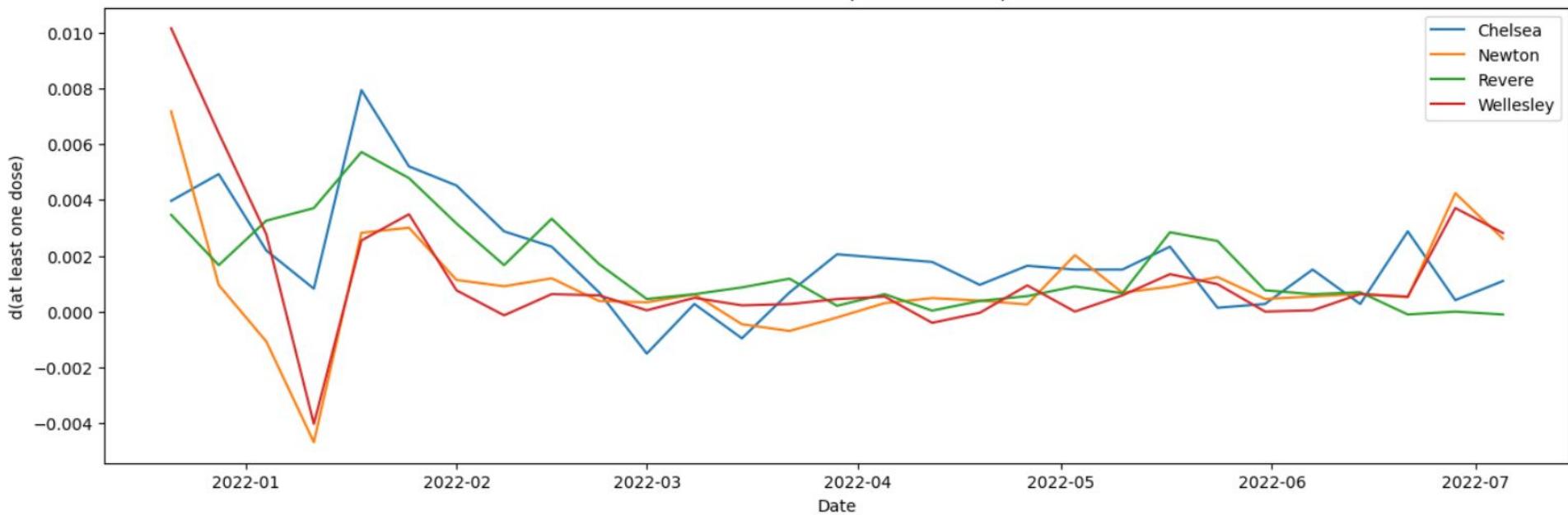
Hispanic: data vs  $d(\text{at least 1 dose})$



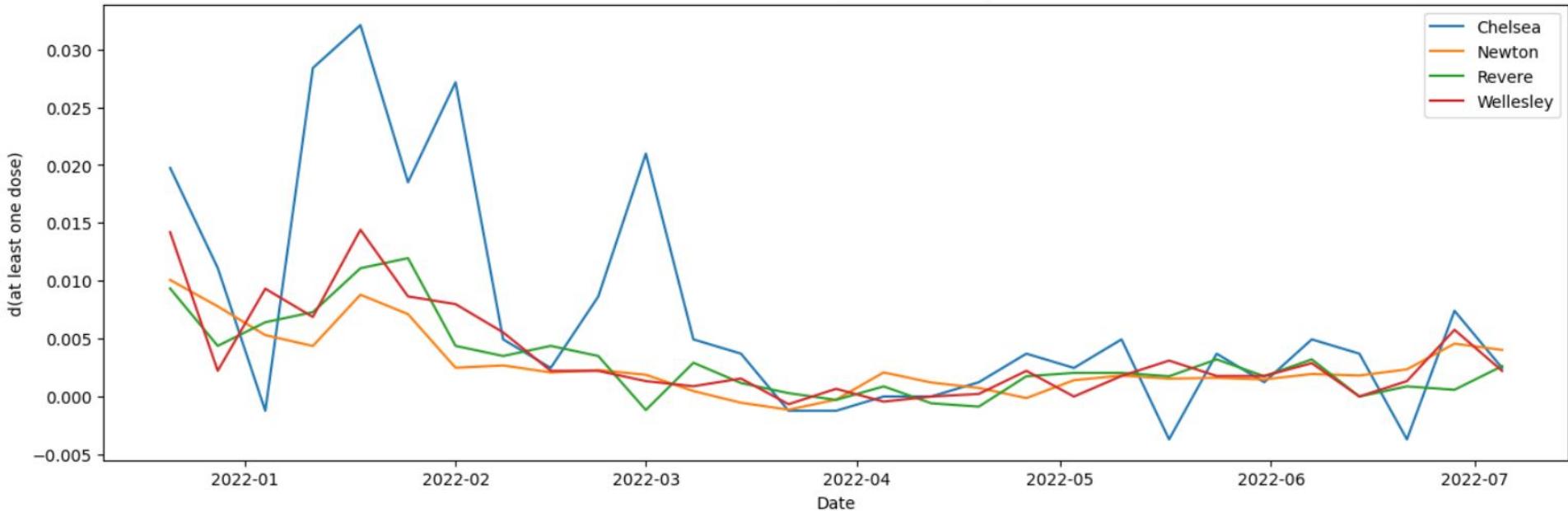
Black: data vs d(at least 1 dose)



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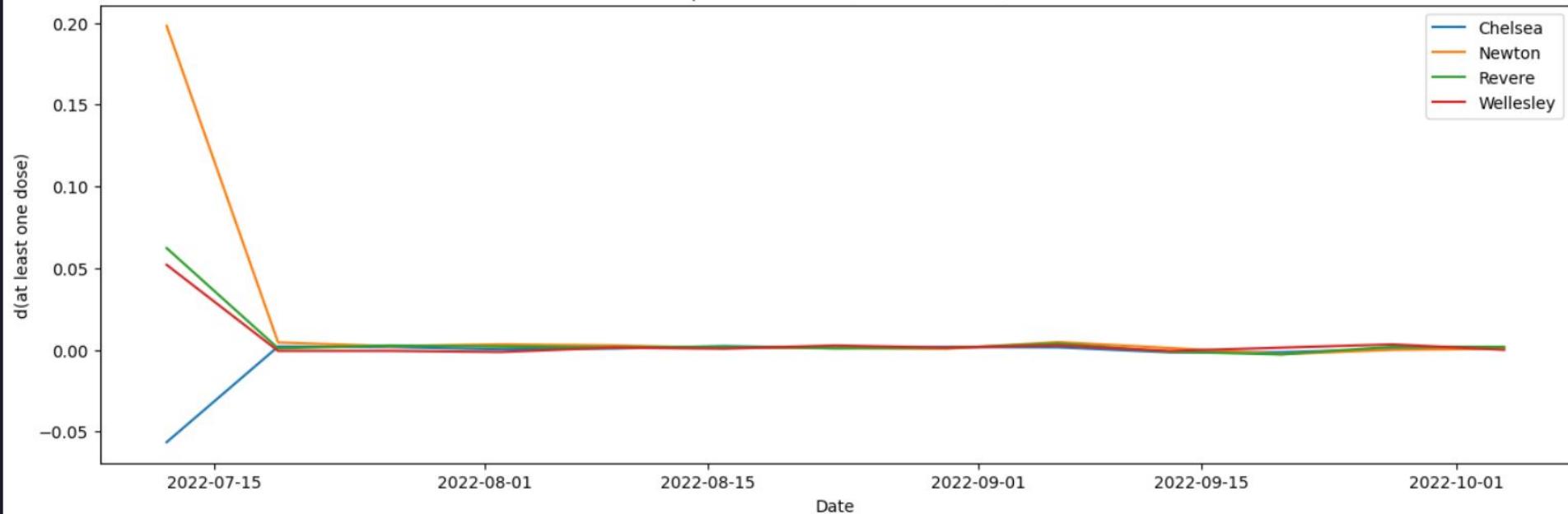


Asian: data vs d(at least 1 dose)

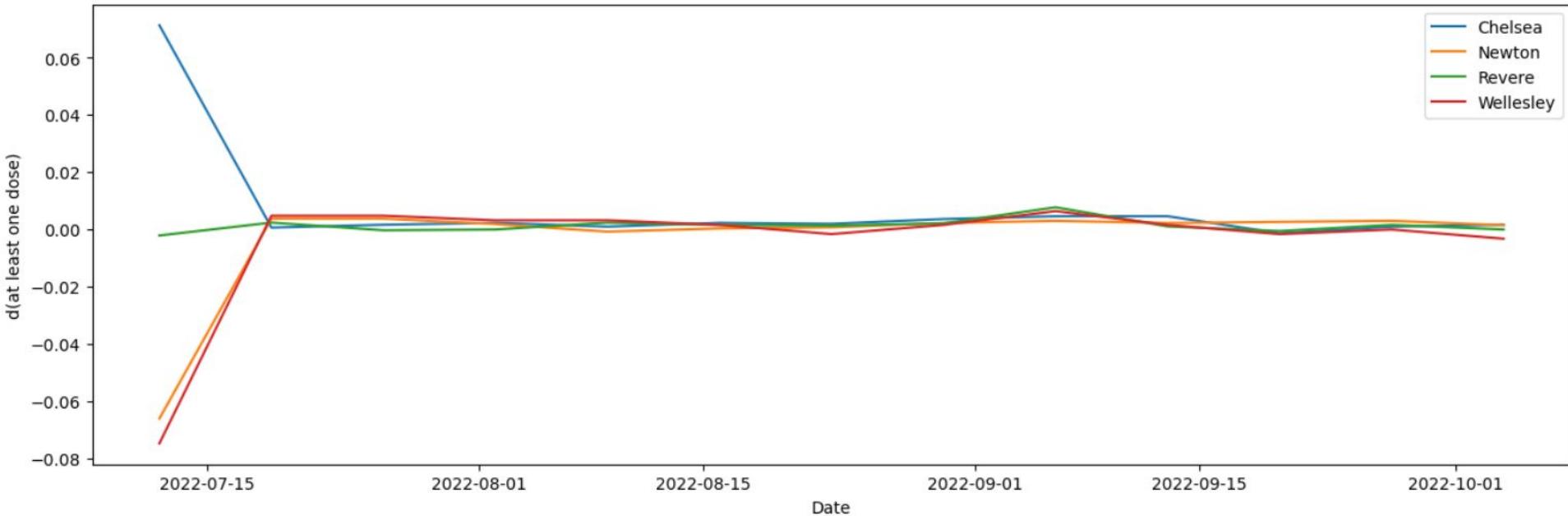


# Booster 2 Rollout

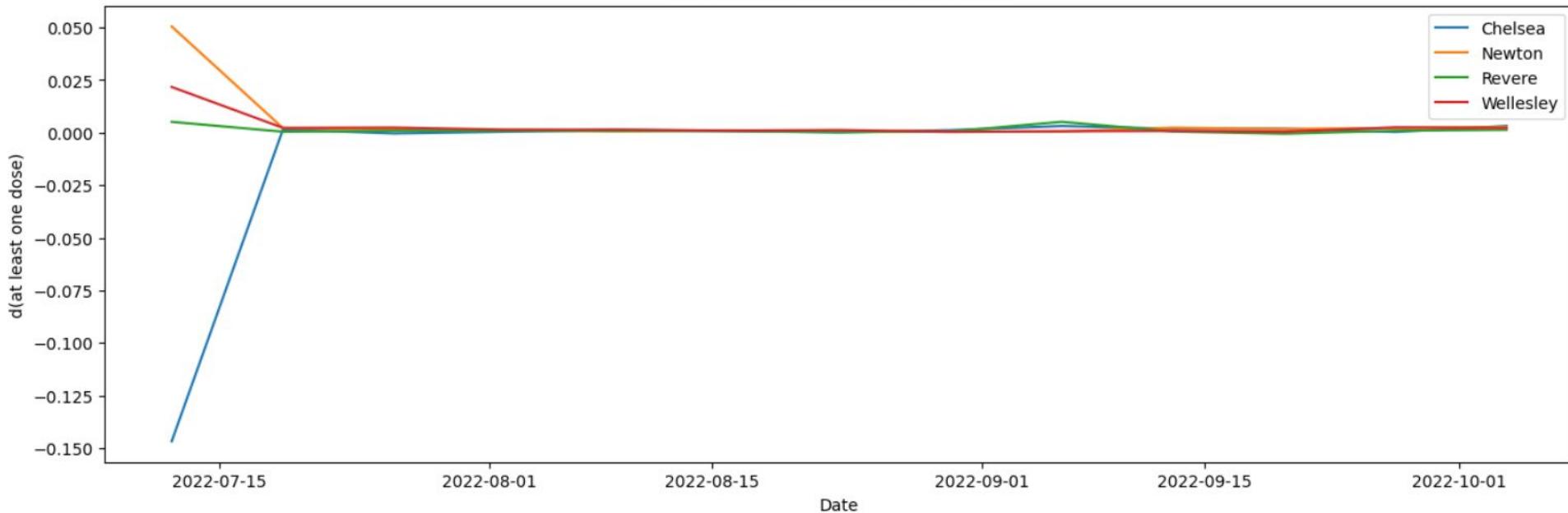
Hispanic: data vs  $d(\text{at least 1 dose})$



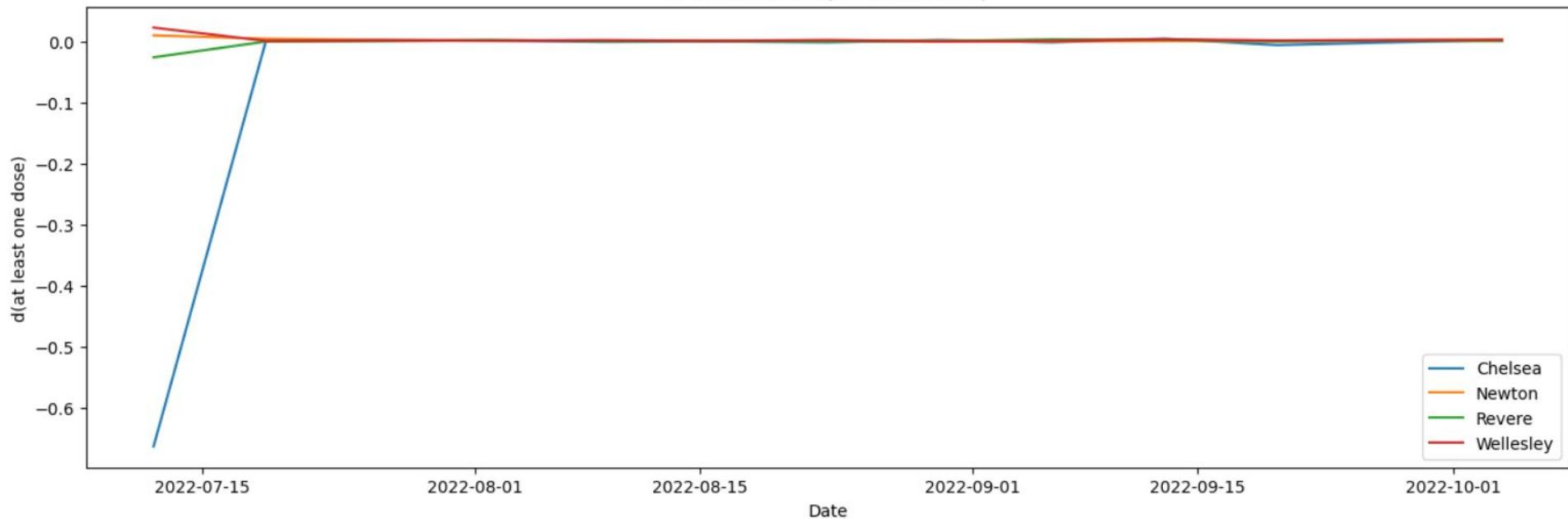
Black: data vs d(at least 1 dose)



Causian: data vs  $d(\text{at least 1 dose})$



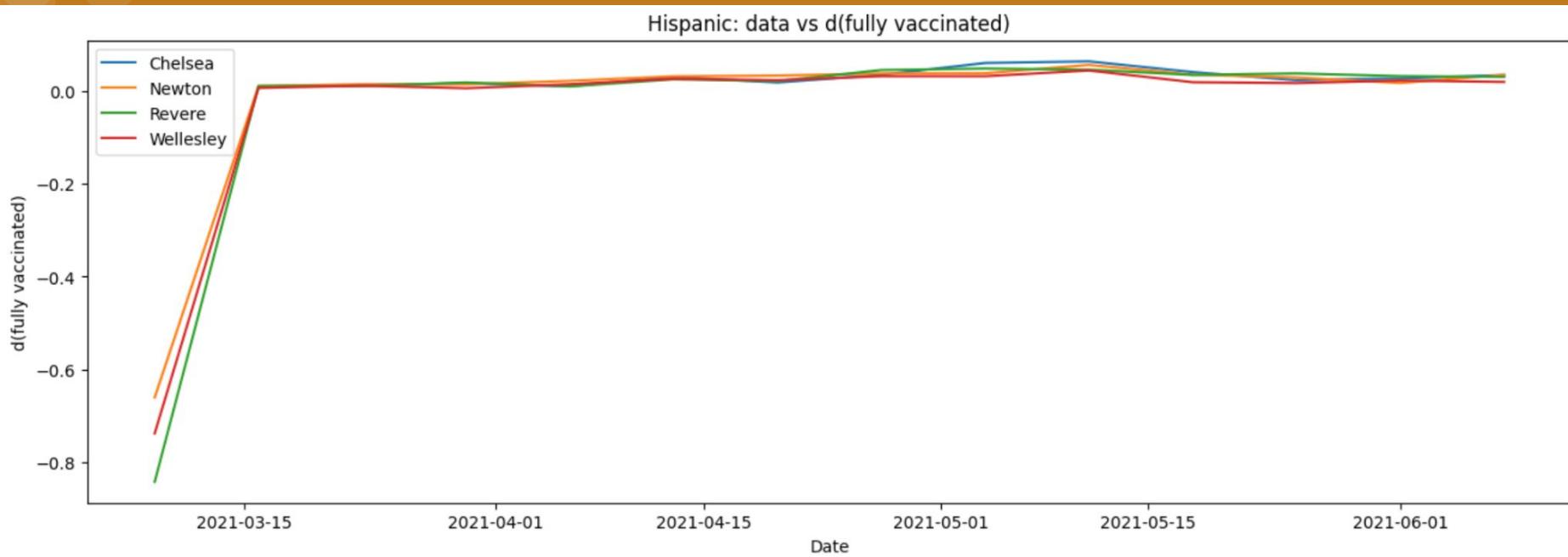
Asian: data vs d(at least 1 dose)



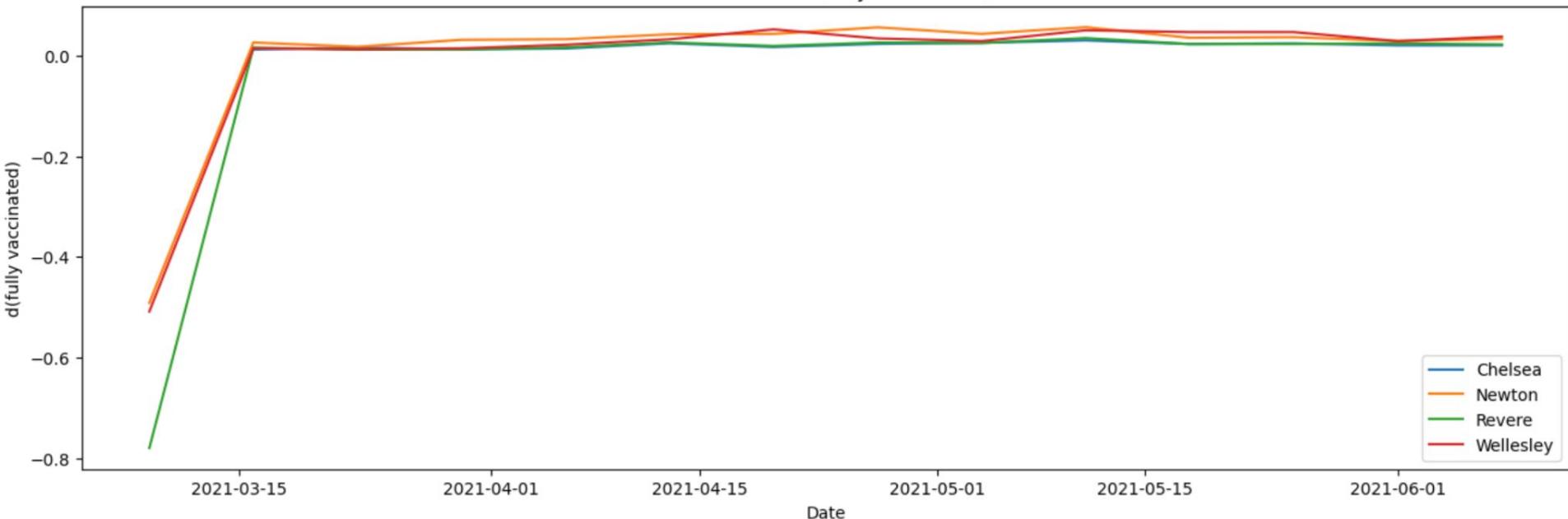
# **Data vs. Rate of Fully Vaccinated by Region**

Each line corresponds to a region, and each graph corresponds to a race.

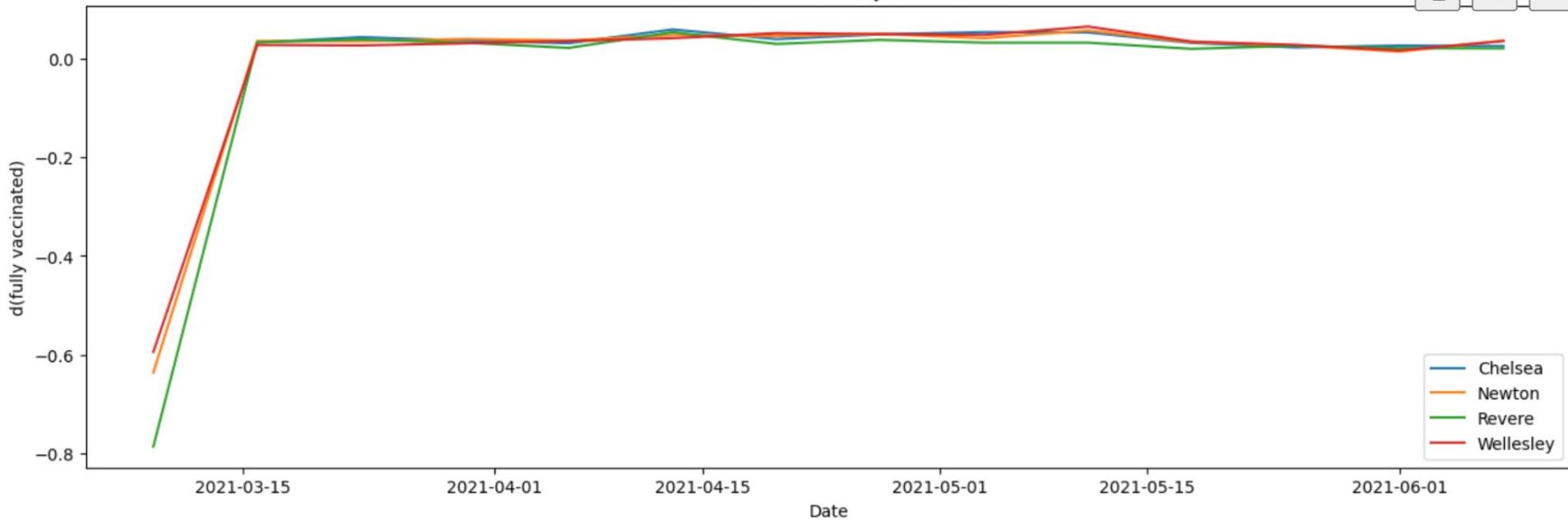
# Early Vaccine Rollout



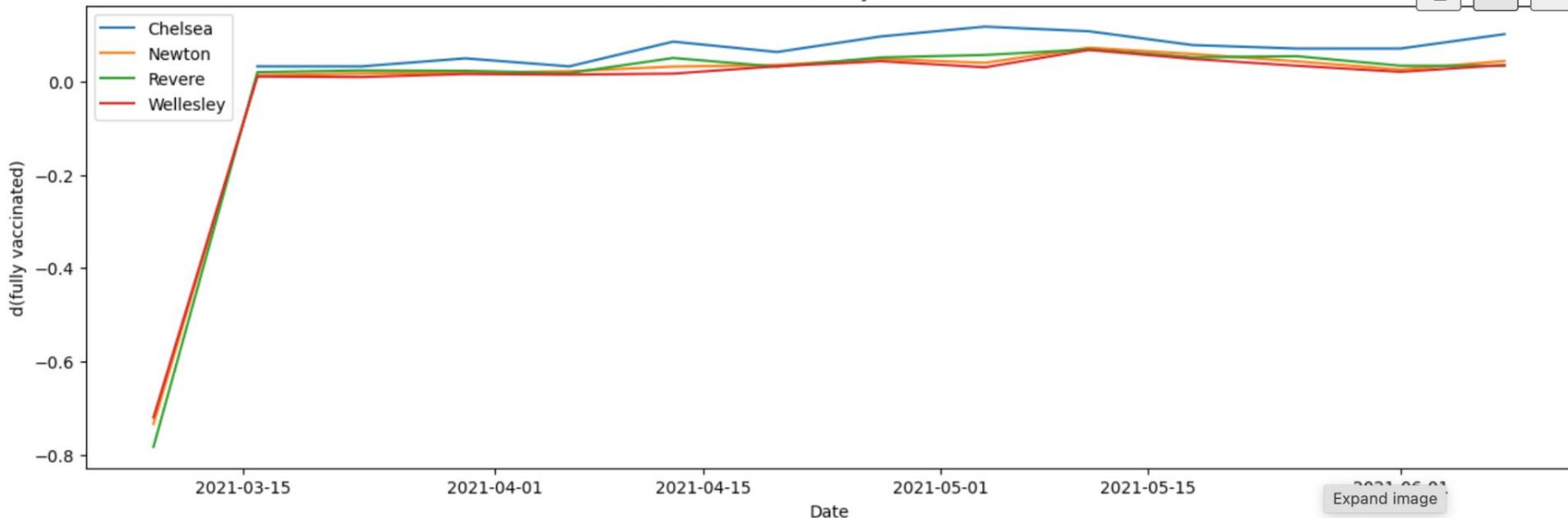
### Black: data vs d(fully vaccinated)



Causian: data vs d(fully vaccinated)

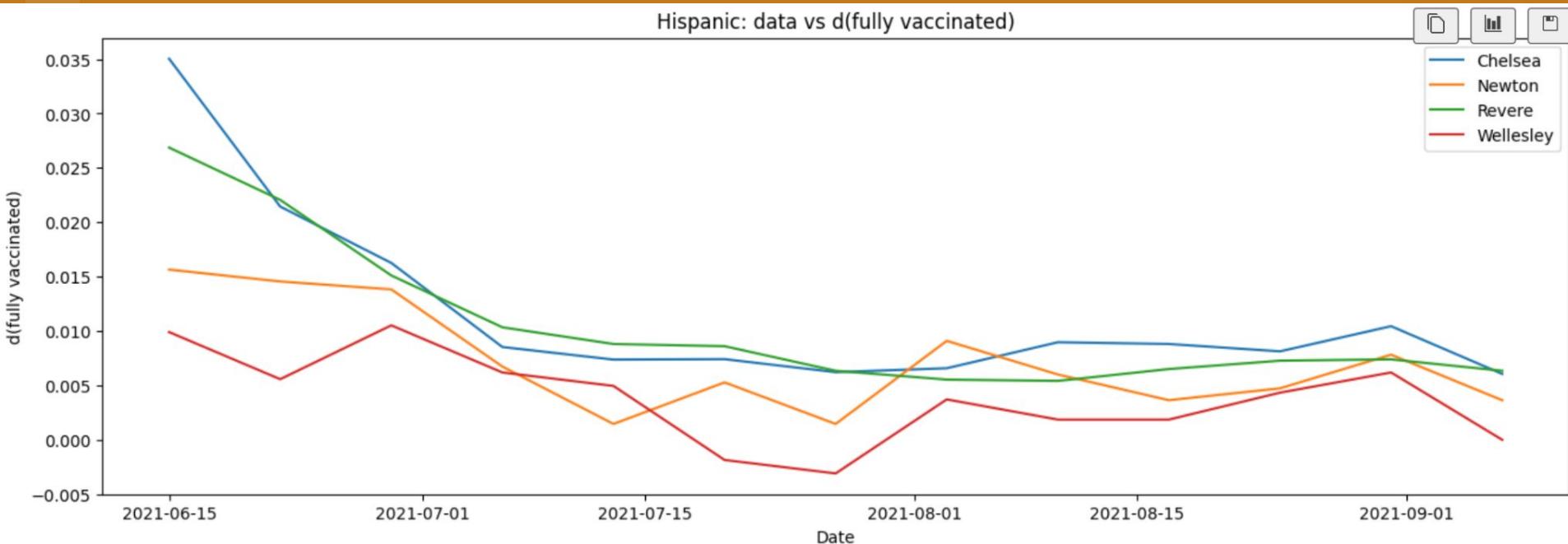


### Asian: data vs d(fully vaccinated)

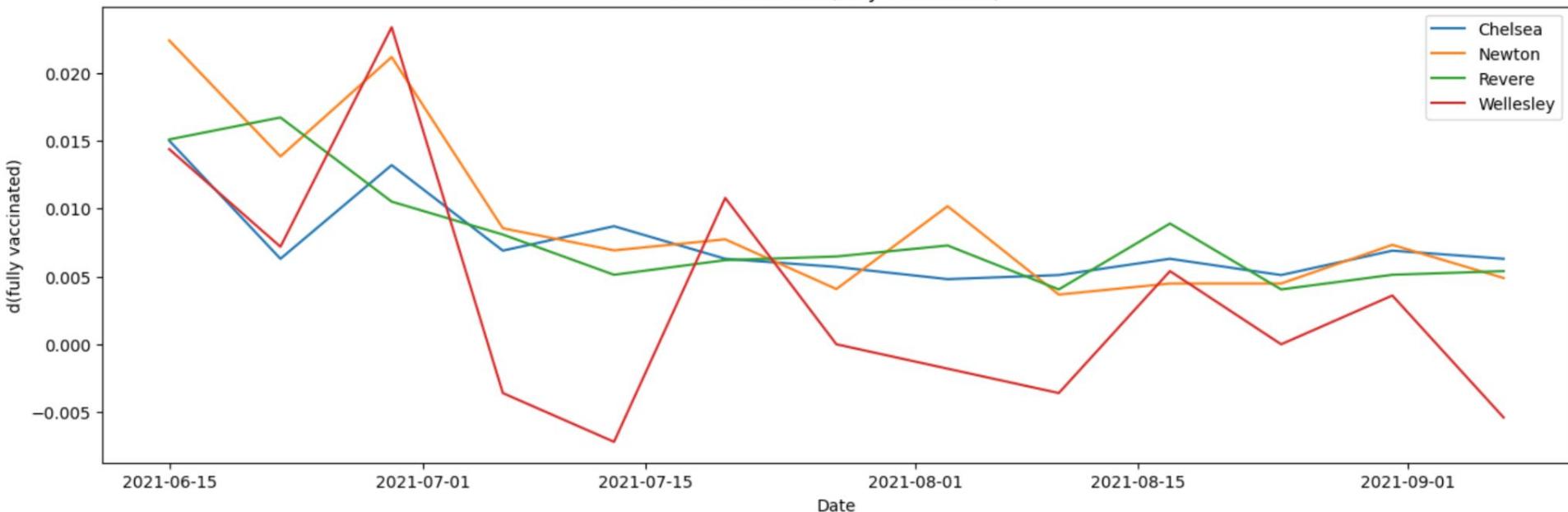


Expand image

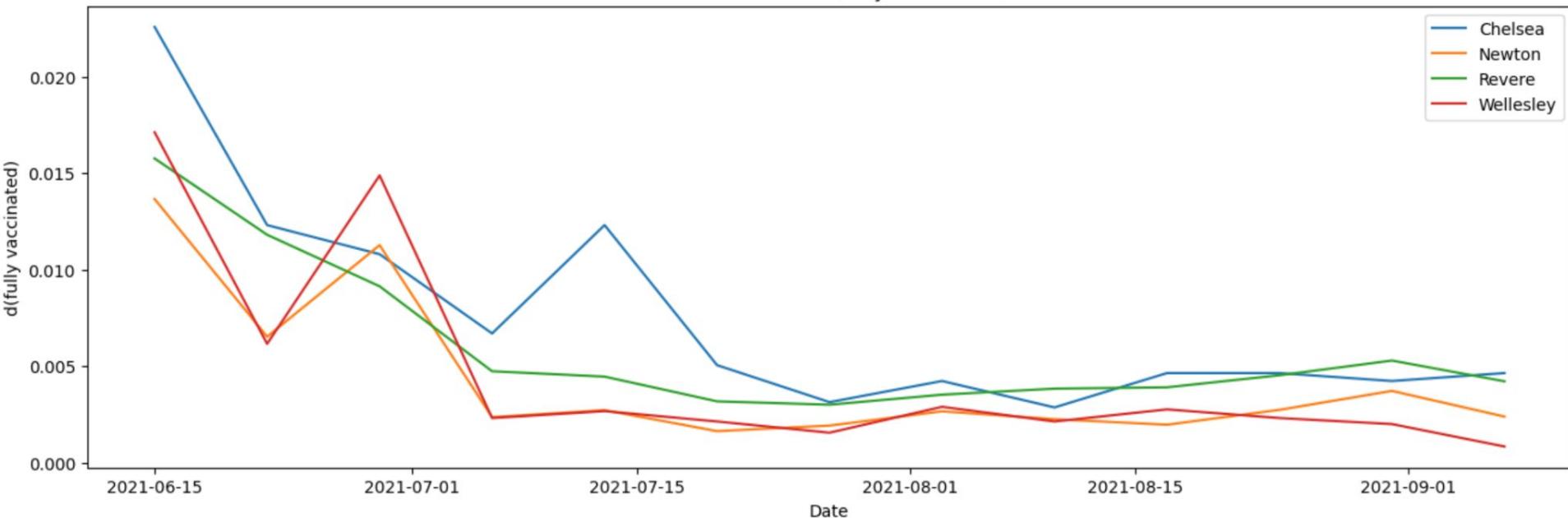
# Middle Vaccine Rollout



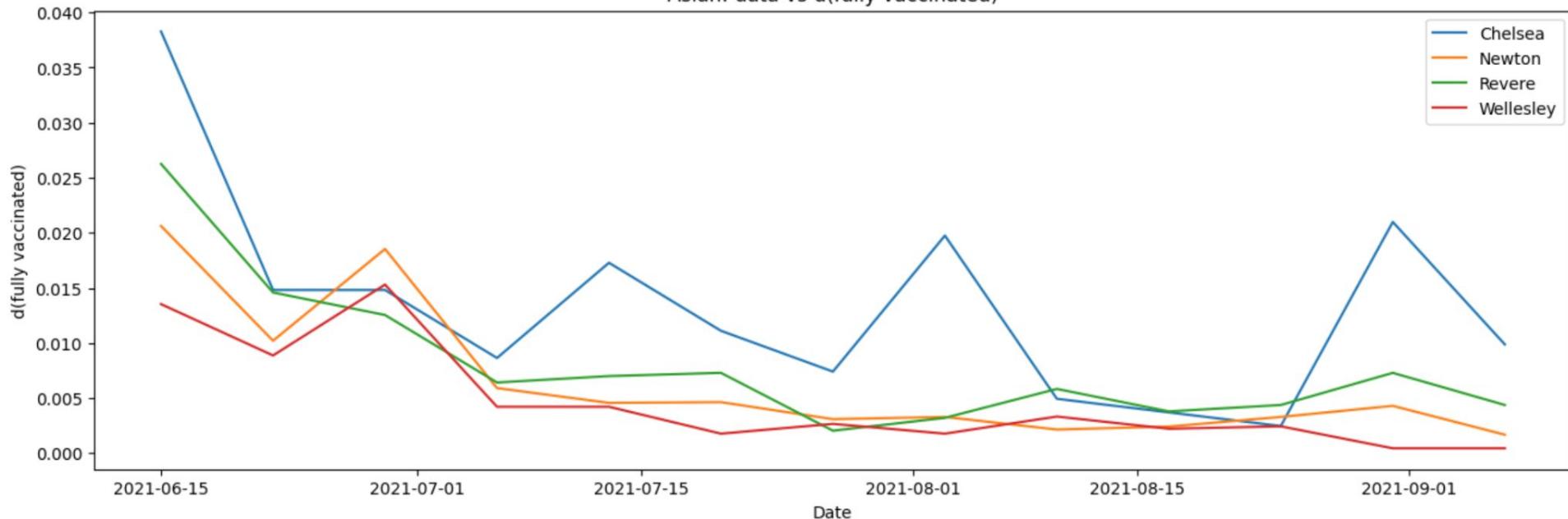
Black: data vs  $d(\text{fully vaccinated})$



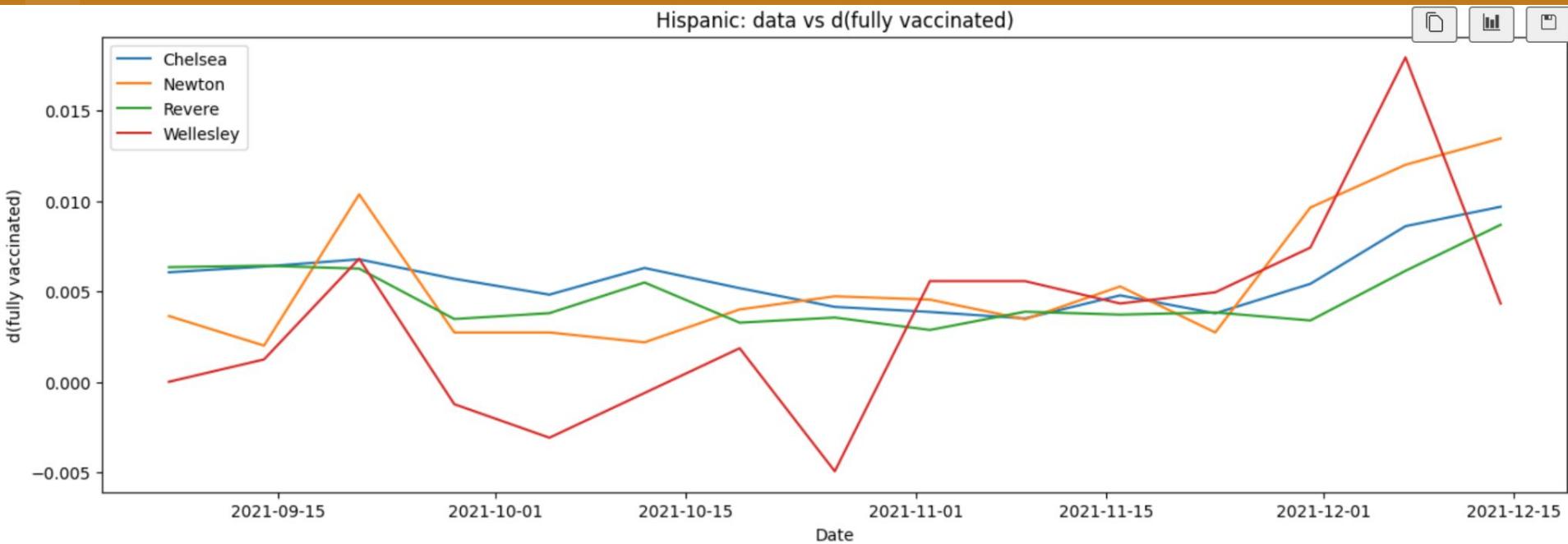
Causian: data vs  $d(\text{fully vaccinated})$



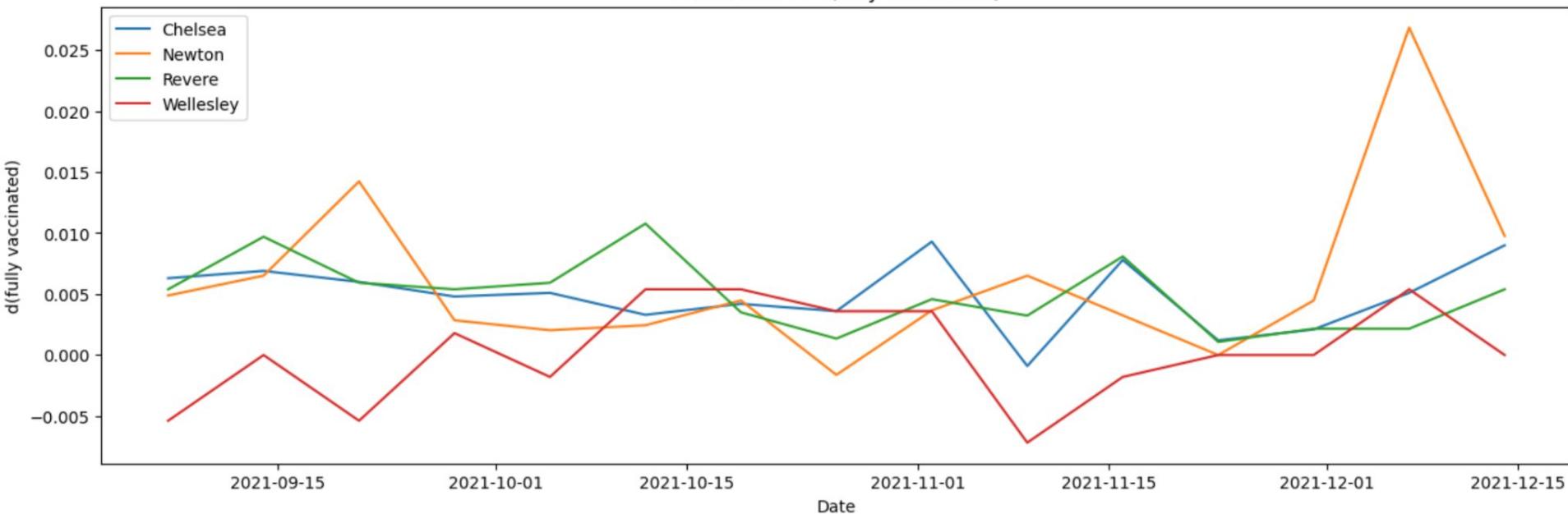
Asian: data vs  $d(\text{fully vaccinated})$



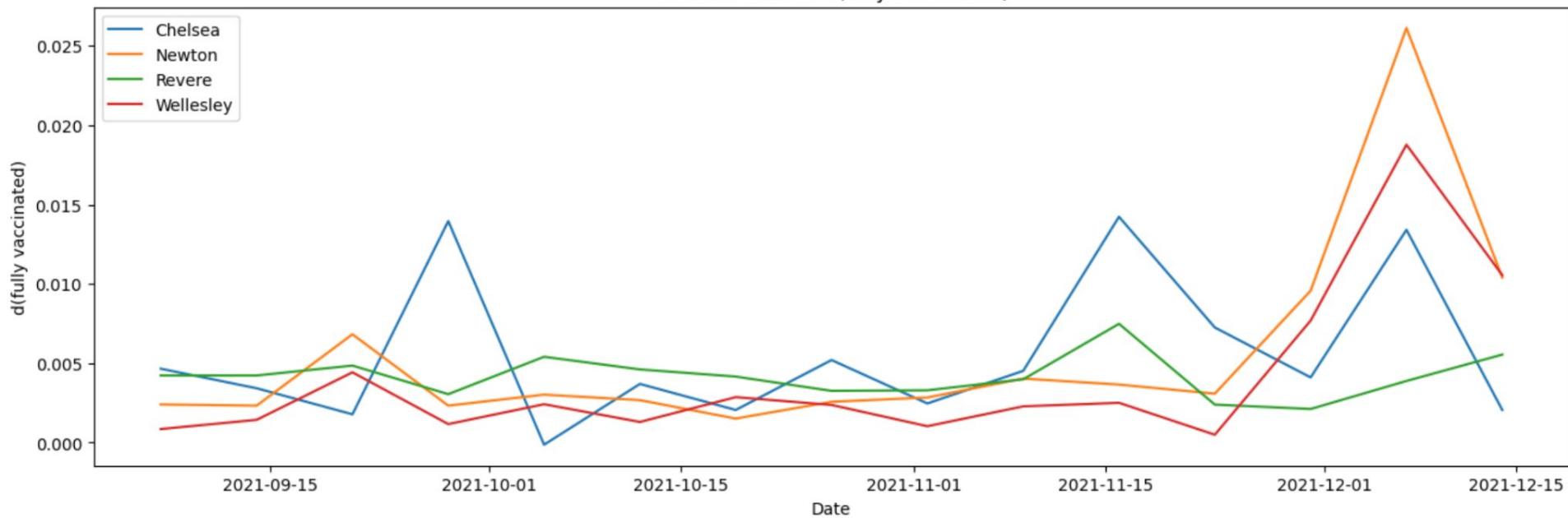
# Late Vaccine Rollout



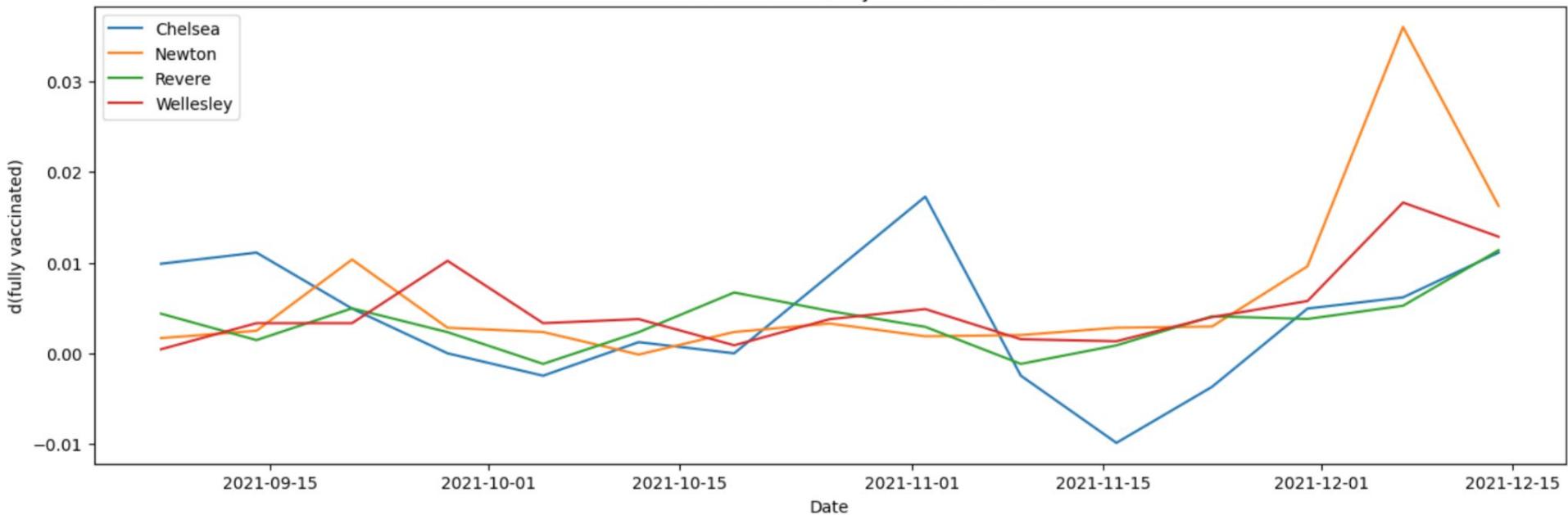
Black: data vs  $d(\text{fully vaccinated})$



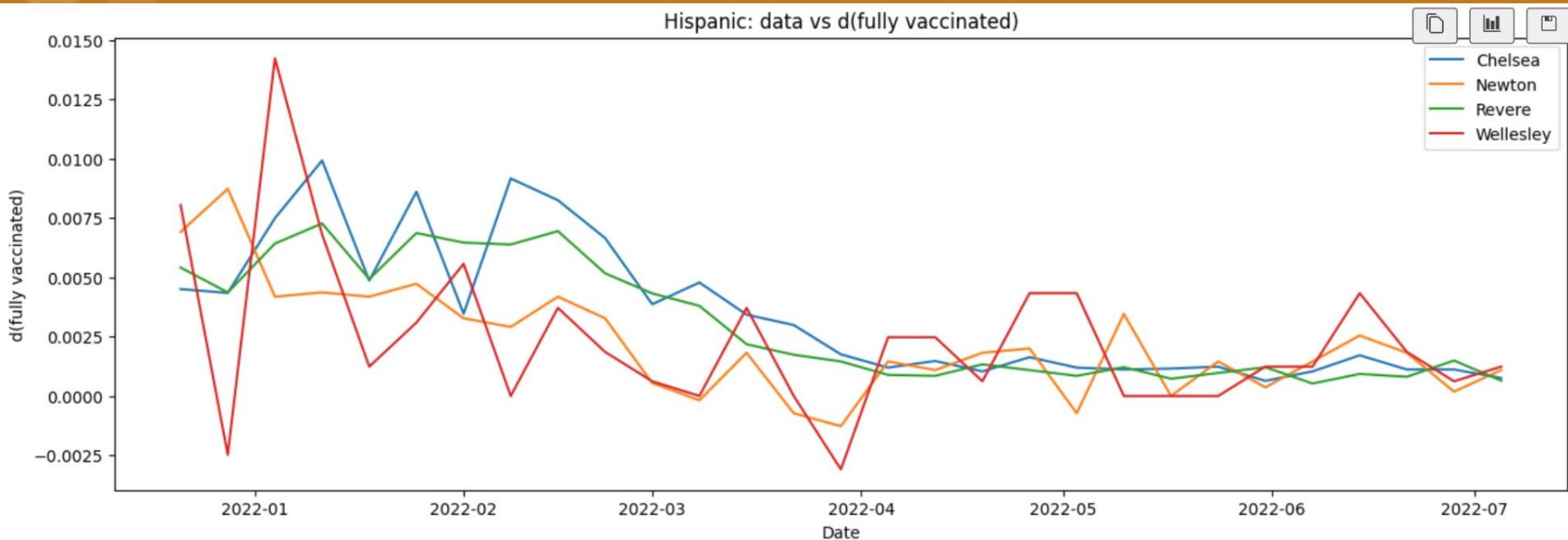
Causian: data vs  $d(\text{fully vaccinated})$



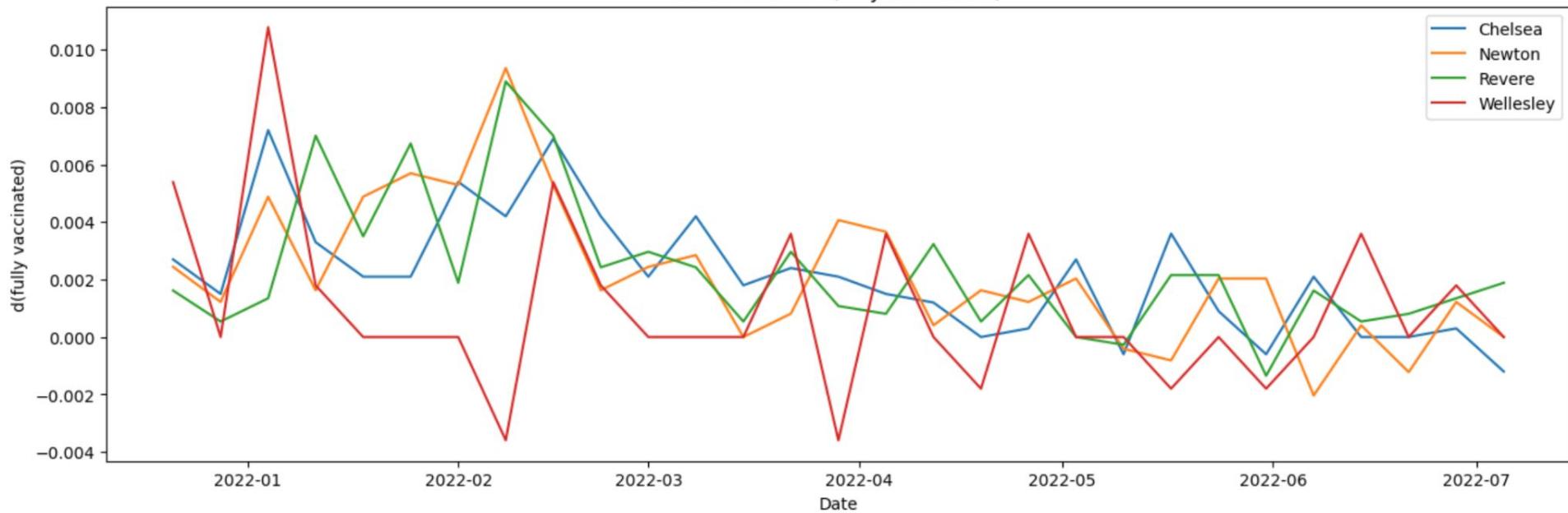
Asian: data vs d(fully vaccinated)



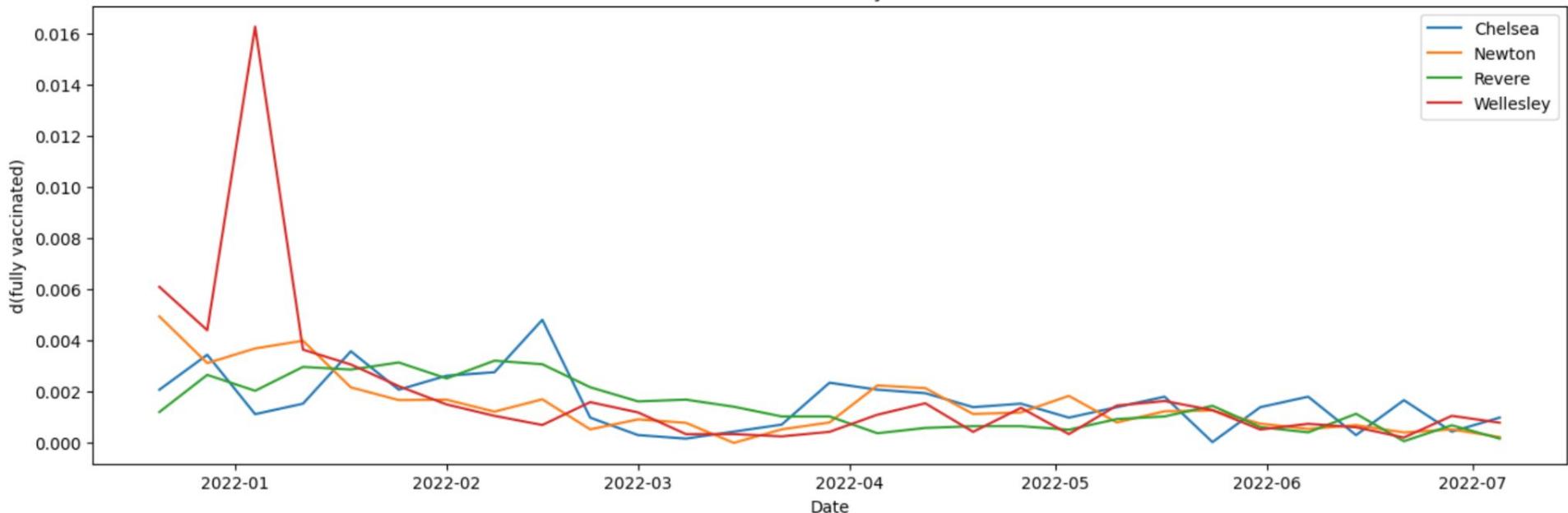
# Booster 1 Rollout



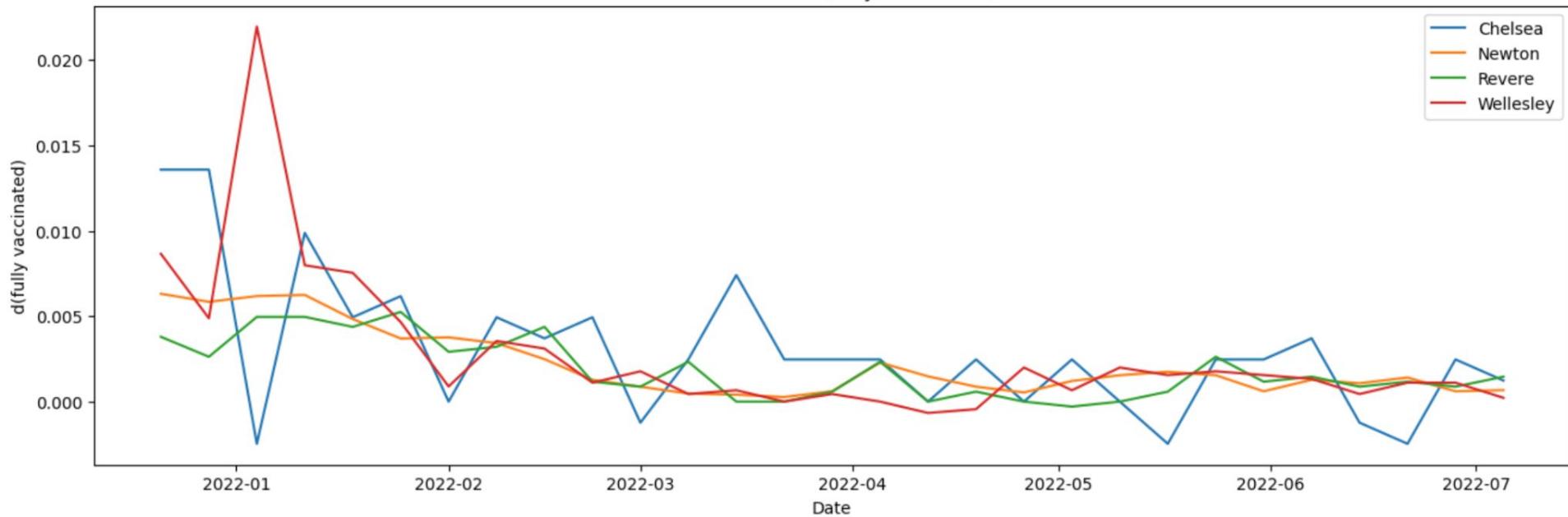
Black: data vs d(fully vaccinated)



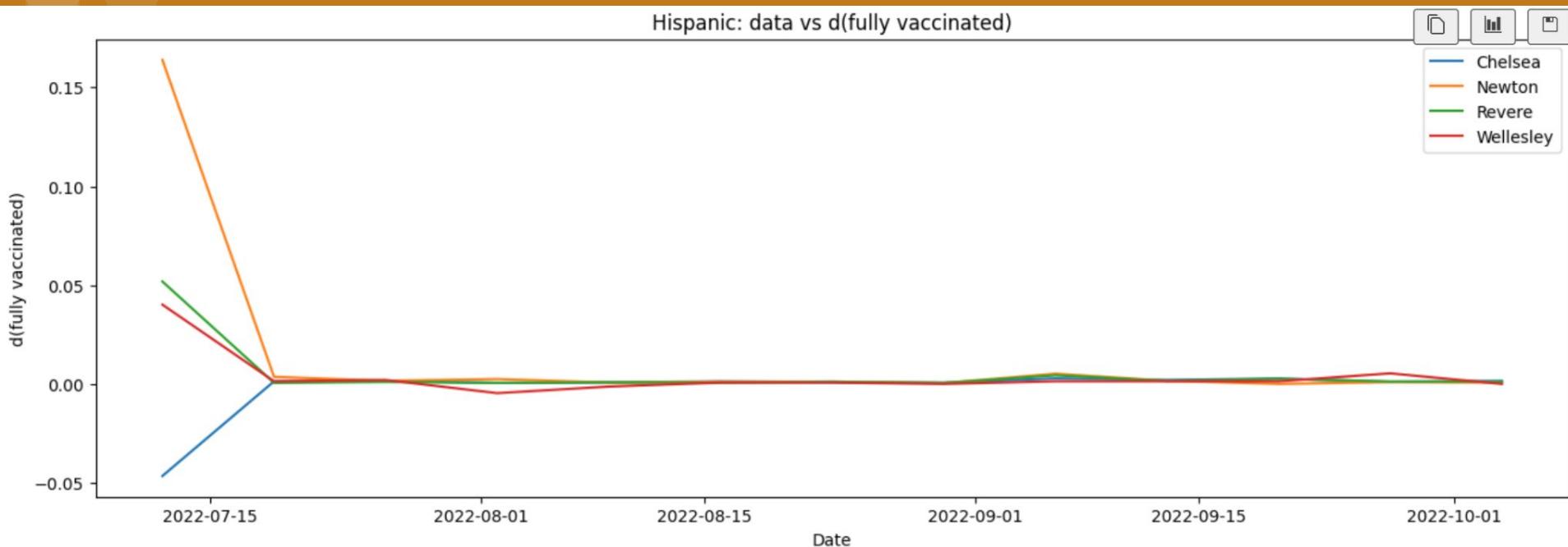
Causian: data vs  $d(\text{fully vaccinated})$



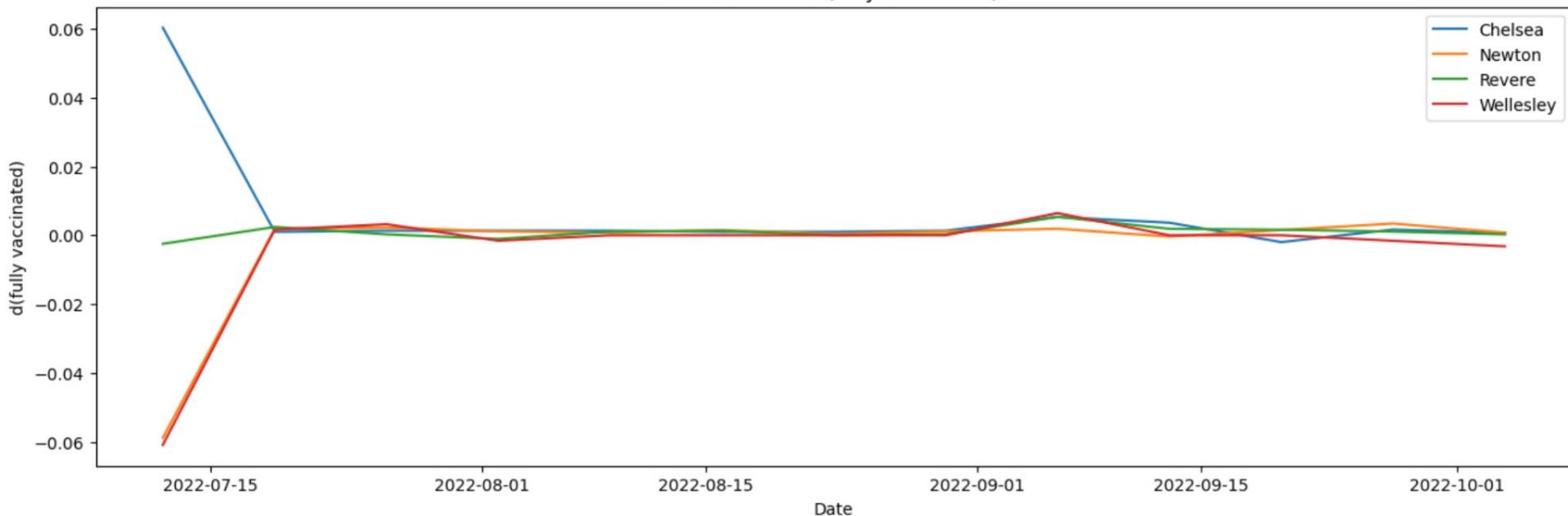
Asian: data vs d(fully vaccinated)



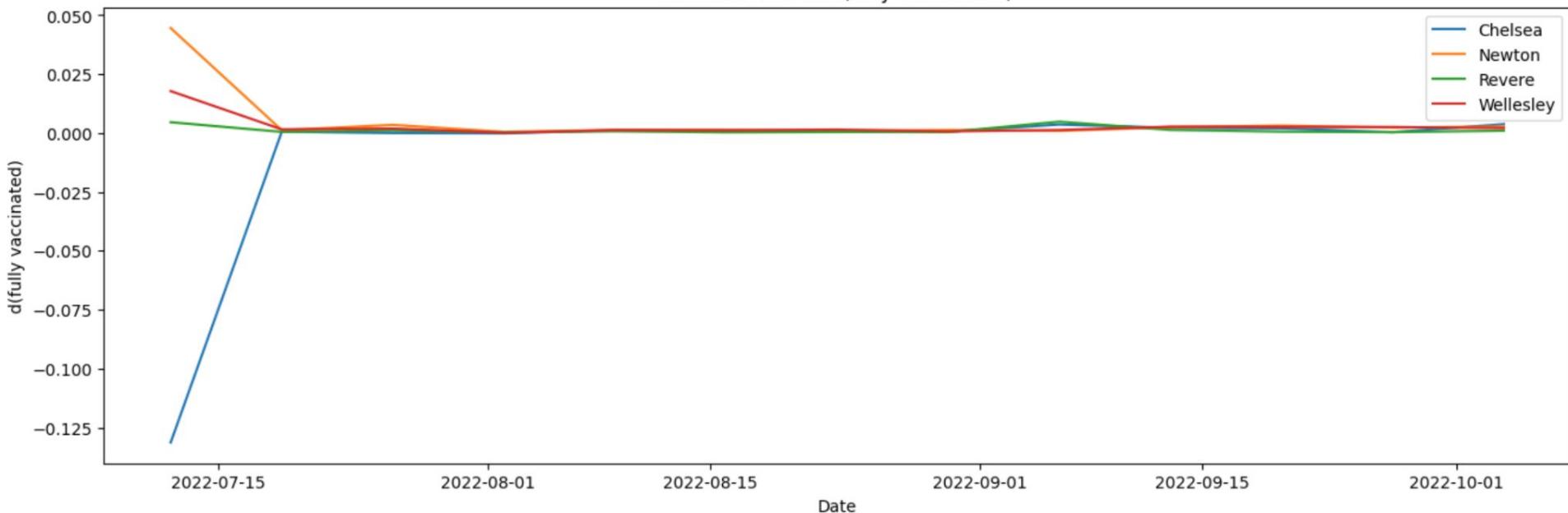
# Booster 2 Rollout



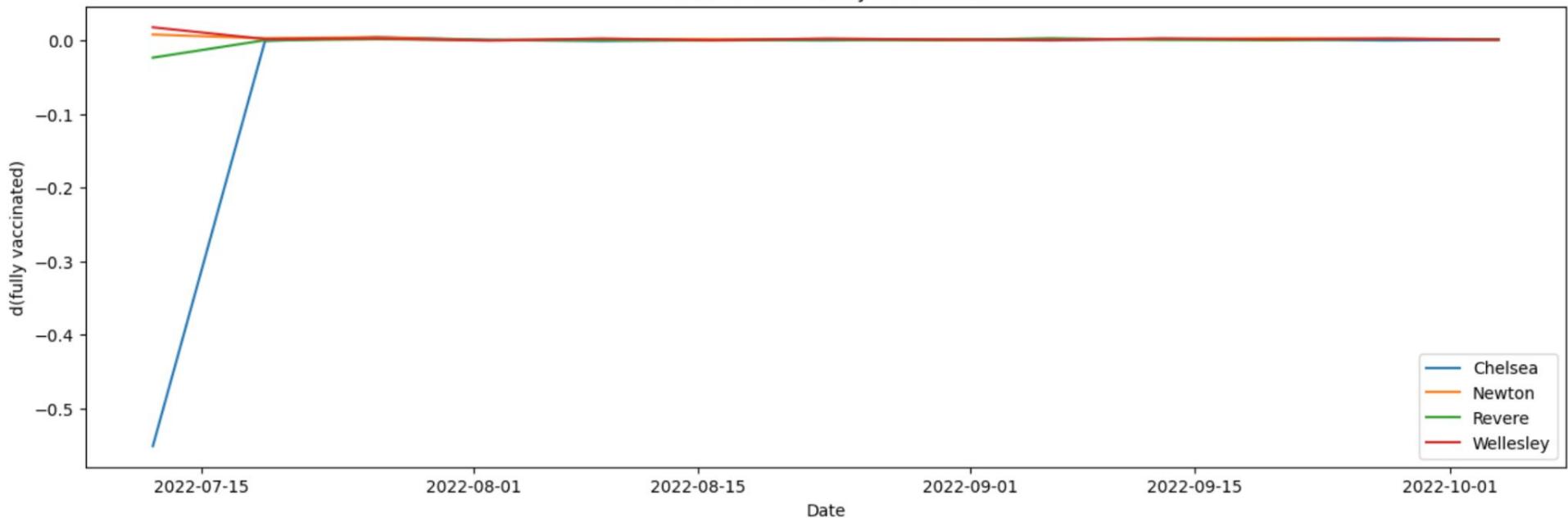
### Black: data vs d(fully vaccinated)



Causian: data vs d(fully vaccinated)



Asian: data vs d(fully vaccinated)

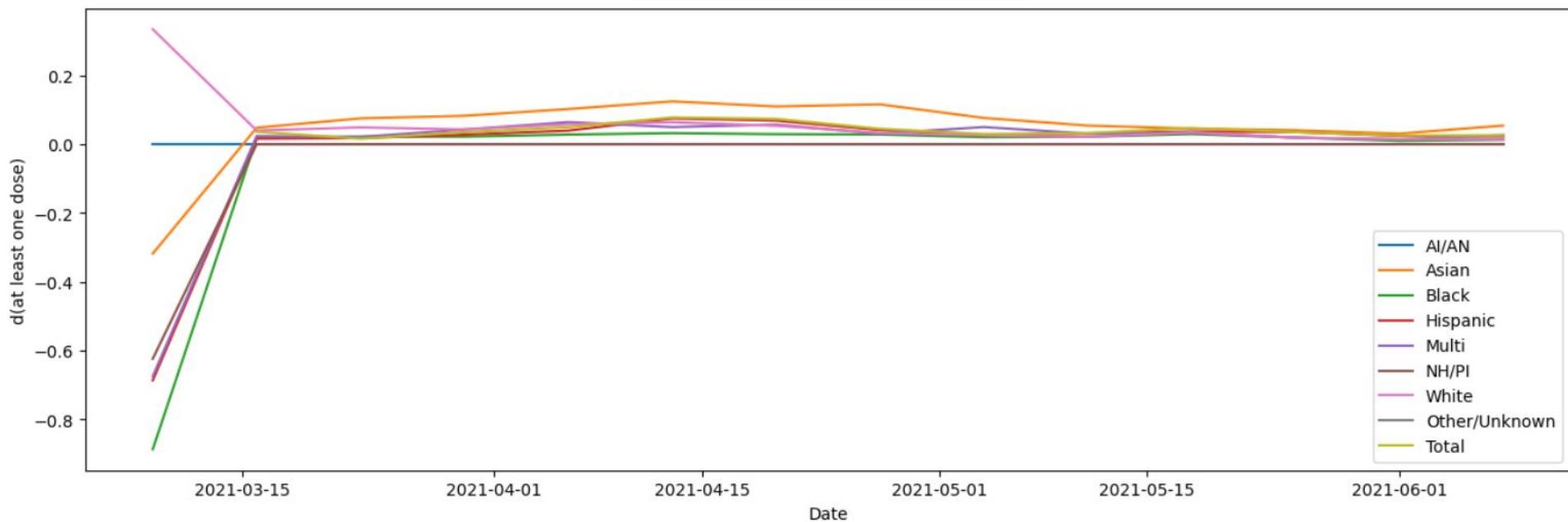


# **Data vs. Rate of At Least 1 Dose by Race**

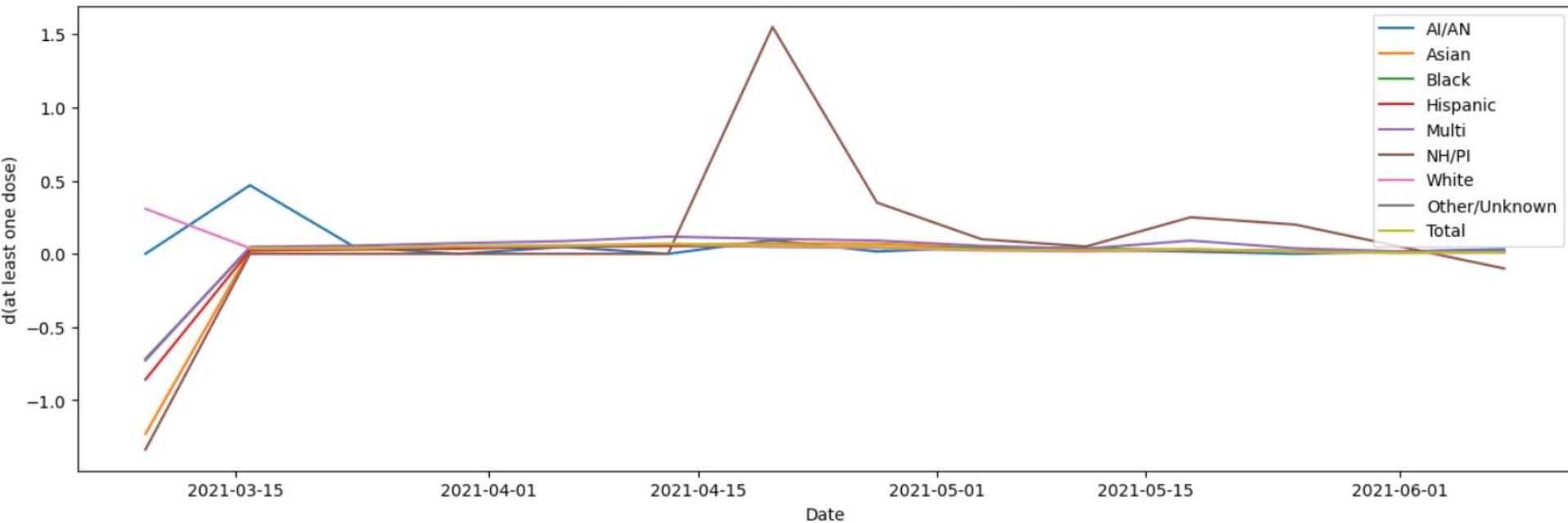
Each line corresponds to a race, and each graph corresponds to a region.

# Early Vaccine Rollout

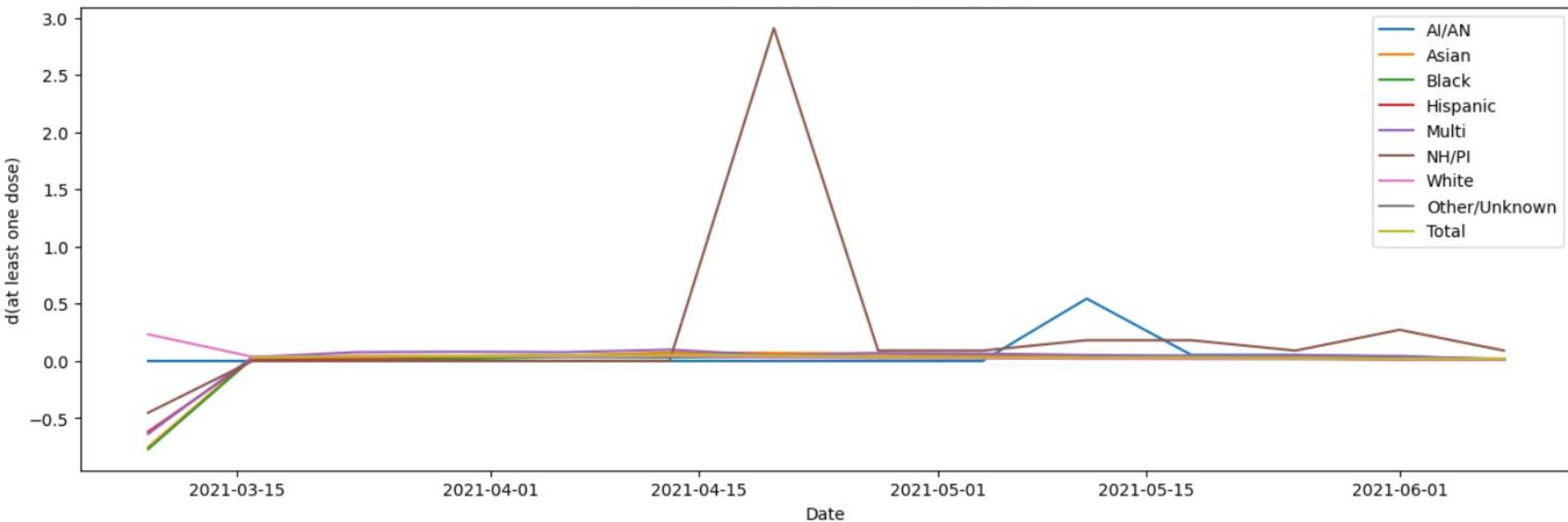
Chelsea: data vs rate of at least 1 dose



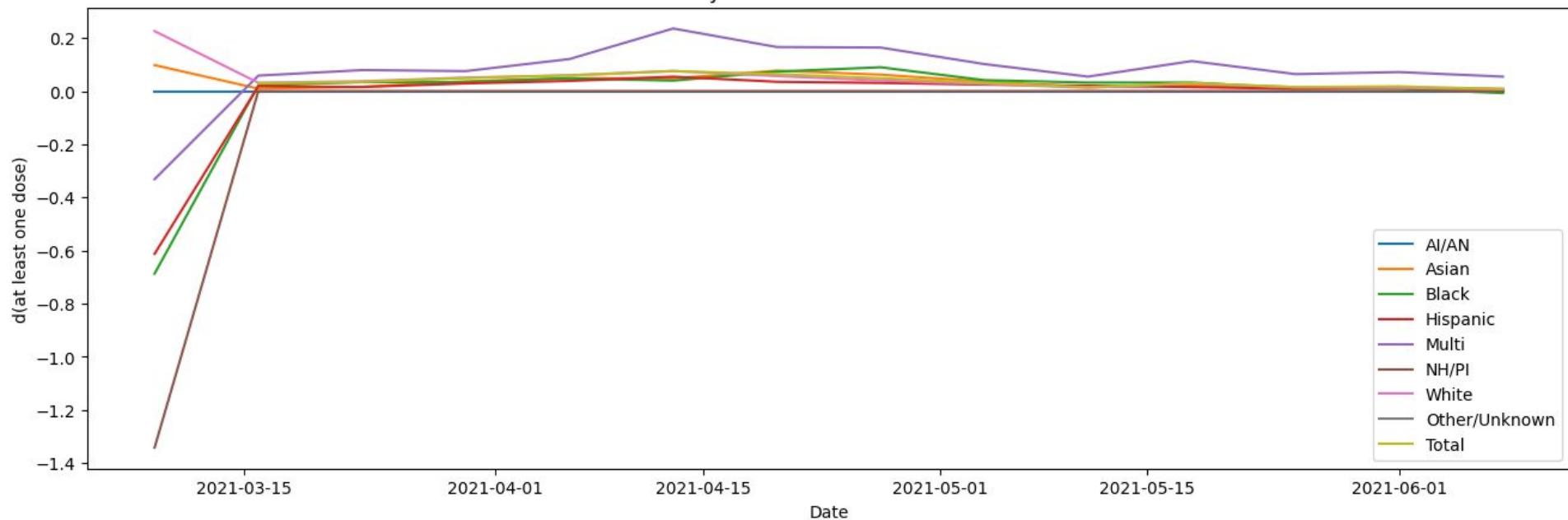
## Newton: data vs rate of at least 1 dose



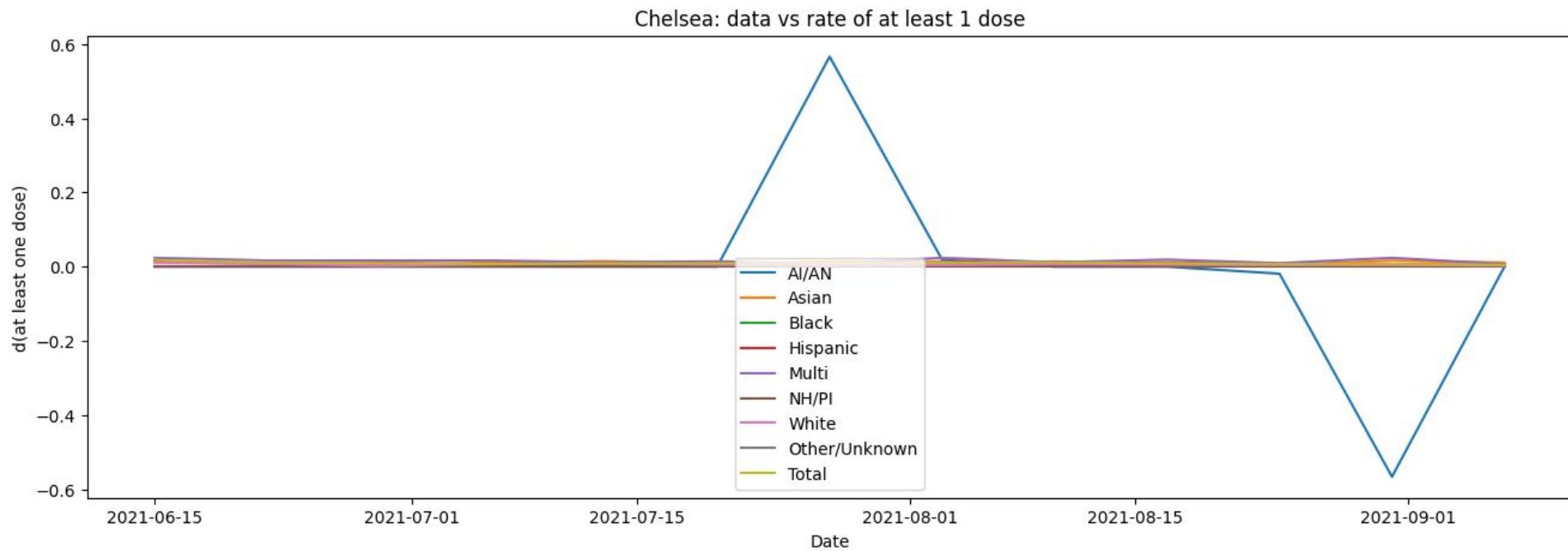
### Revere: data vs rate of at least 1 dose



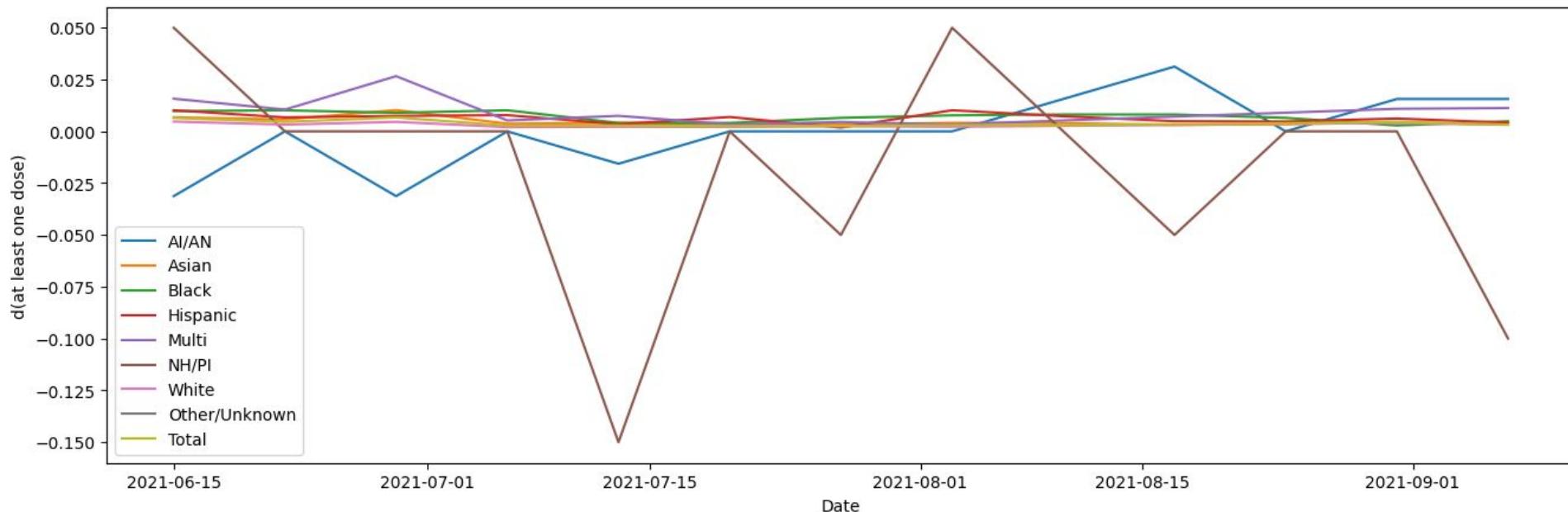
### Wellesley: data vs rate of at least 1 dose



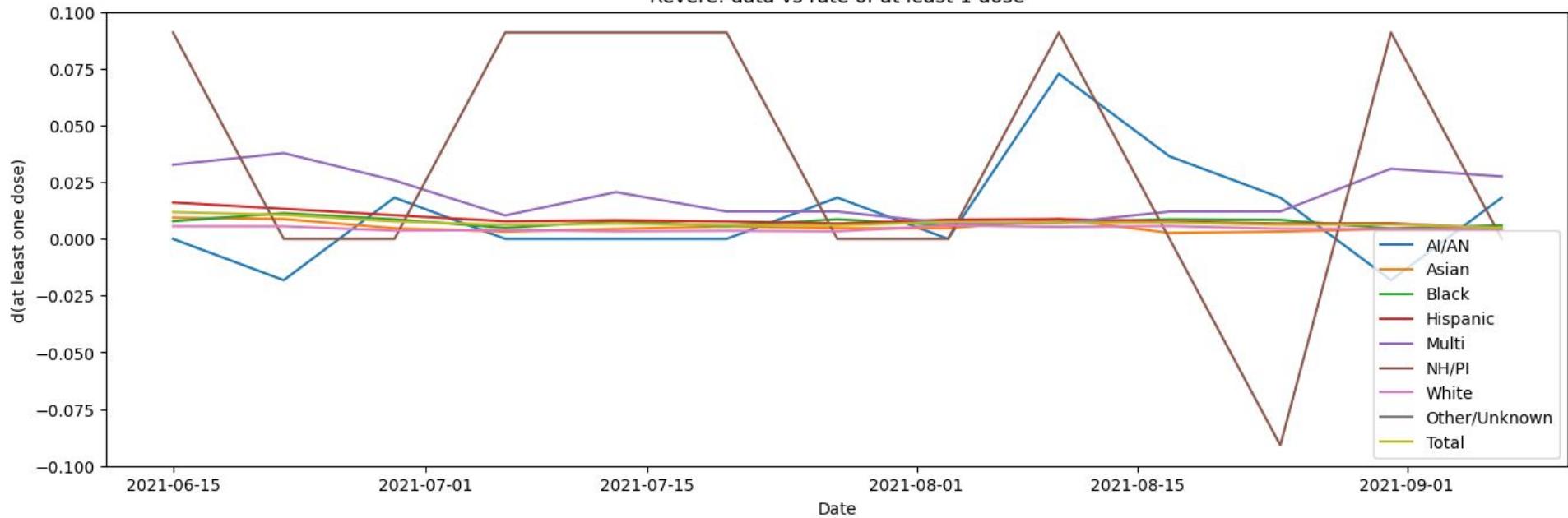
## Middle Vaccine Rollout



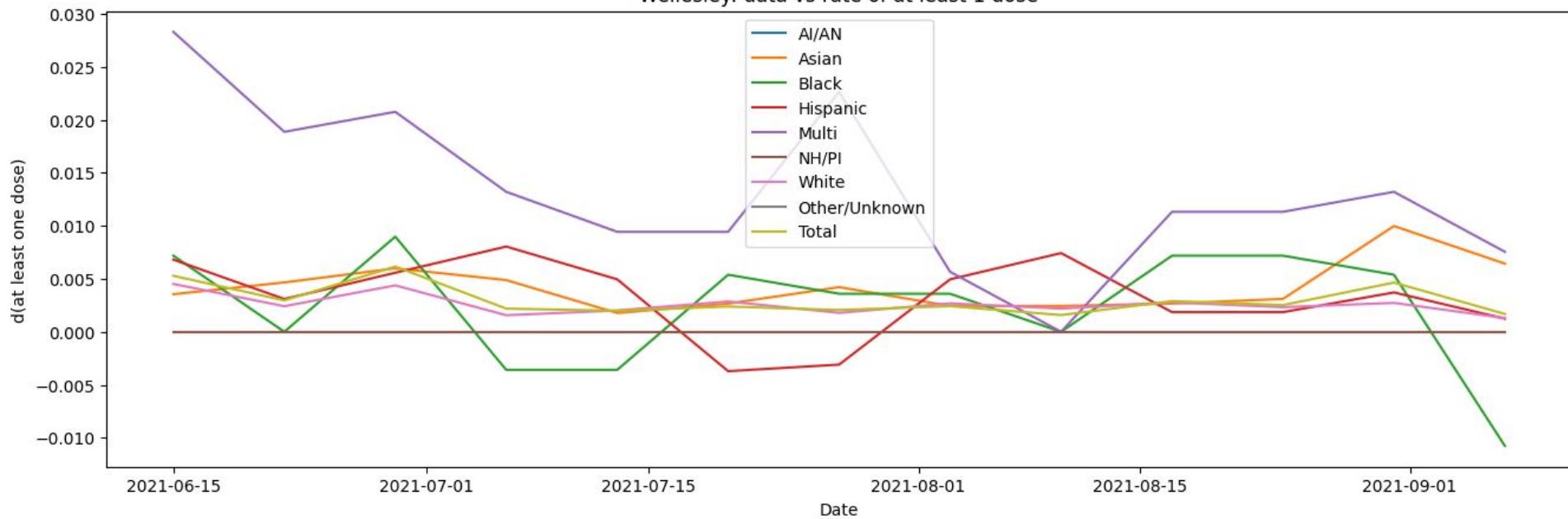
Newton: data vs rate of at least 1 dose



### Revere: data vs rate of at least 1 dose

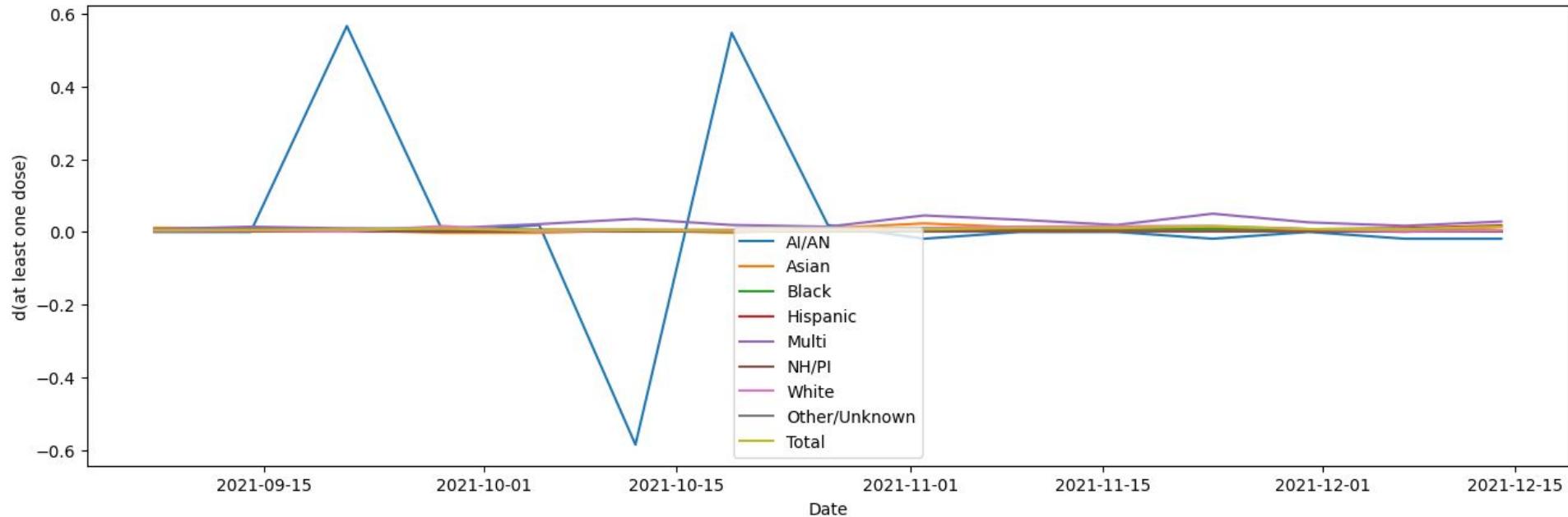


### Wellesley: data vs rate of at least 1 dose

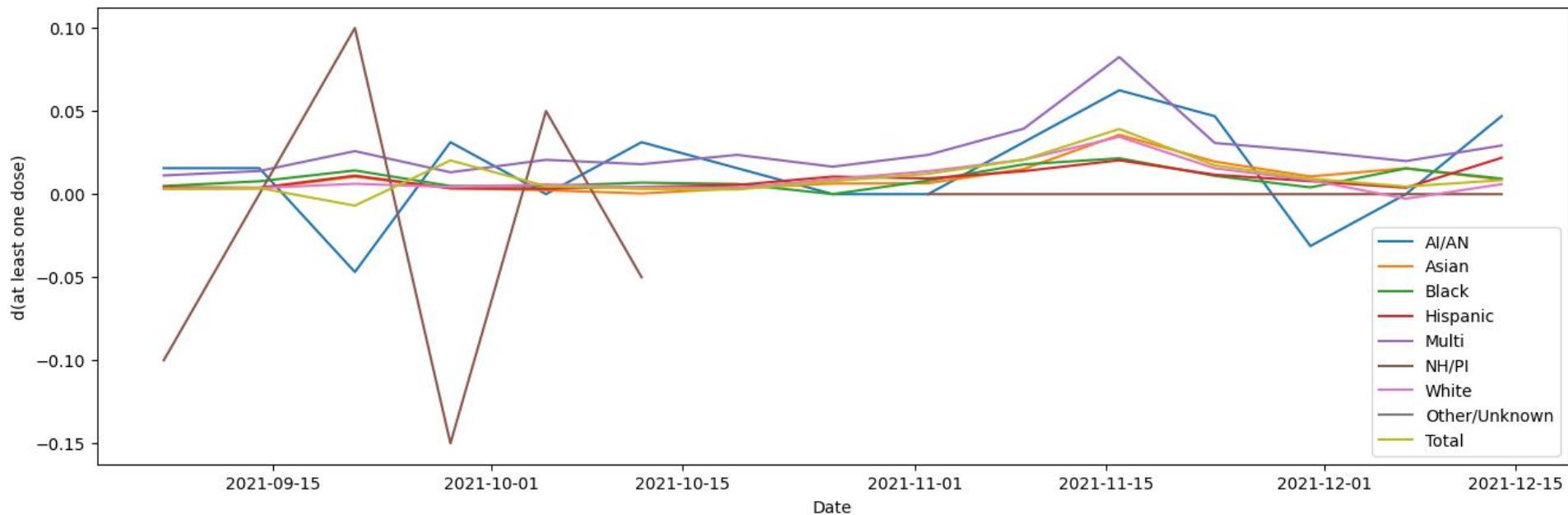


# Late Vaccine Rollout

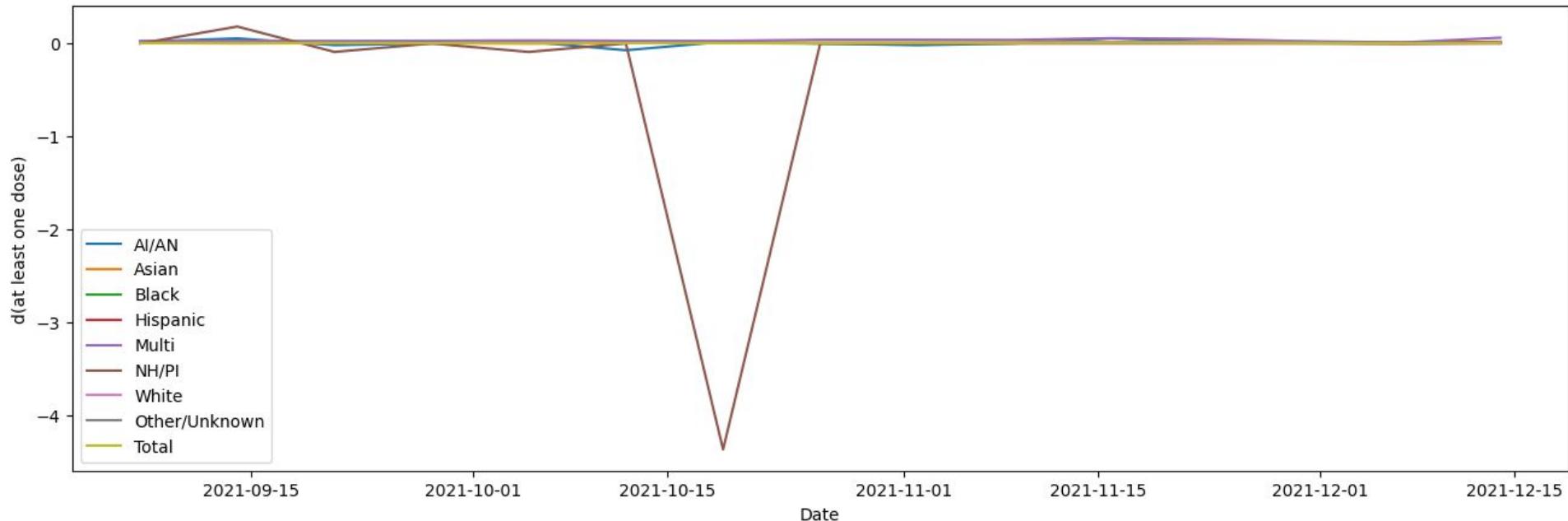
Chelsea: data vs rate of at least 1 dose



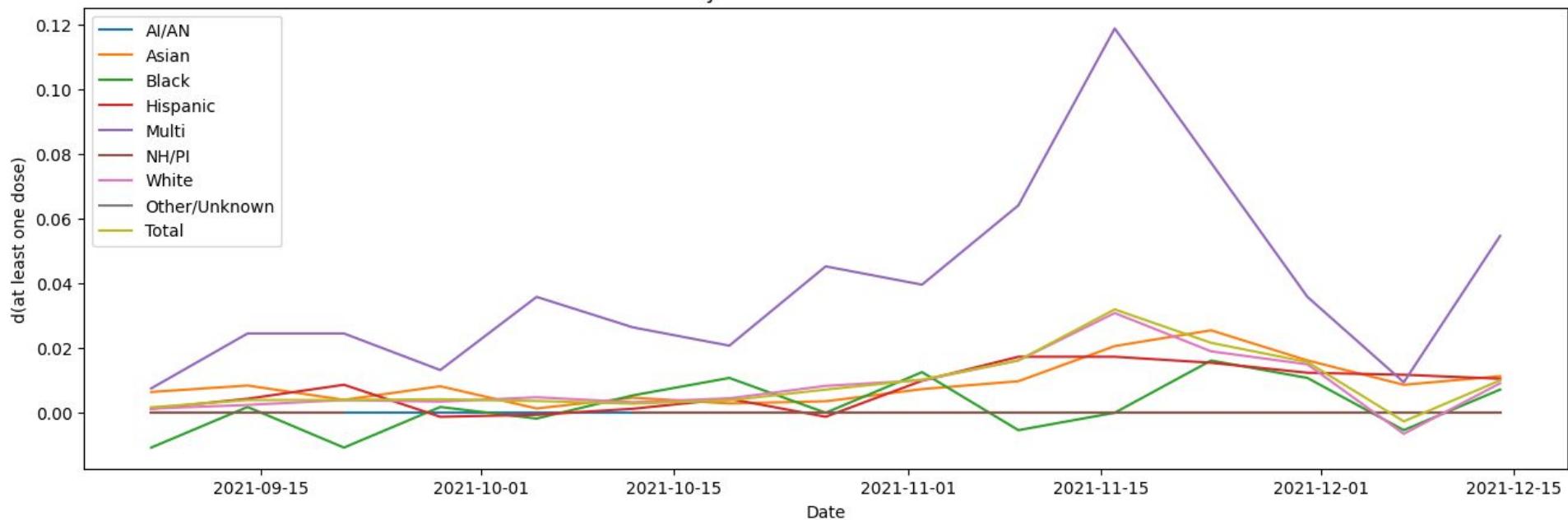
Newton: data vs rate of at least 1 dose



## Revere: data vs rate of at least 1 dose

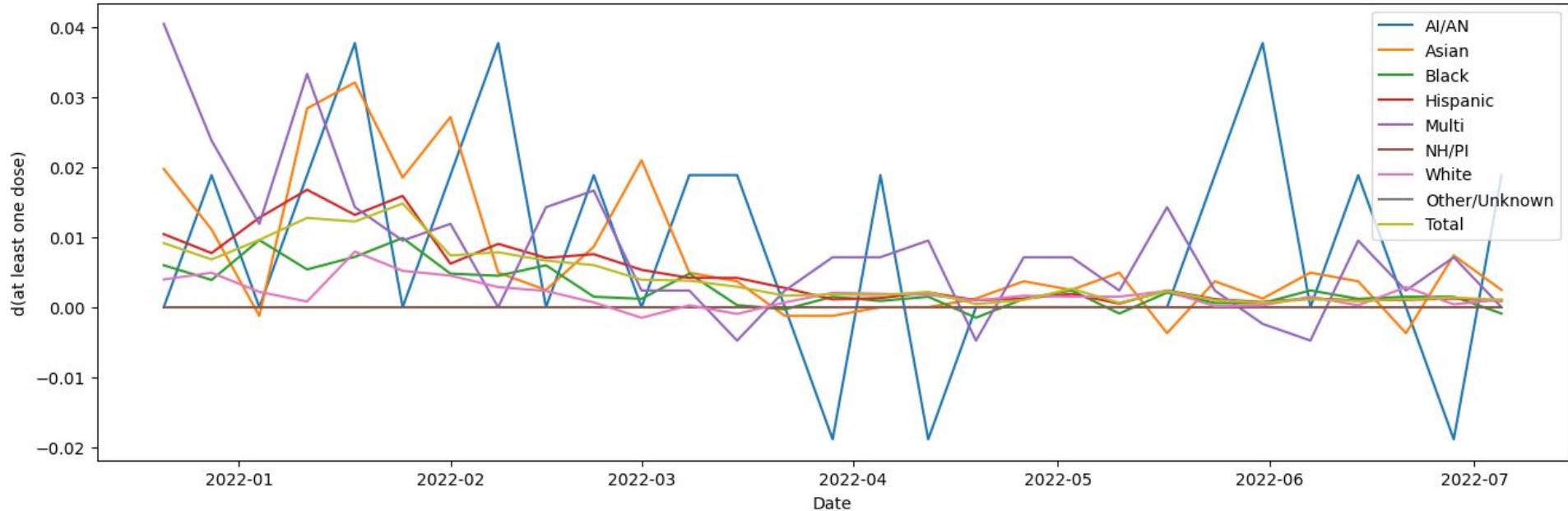


### Wellesley: data vs rate of at least 1 dose

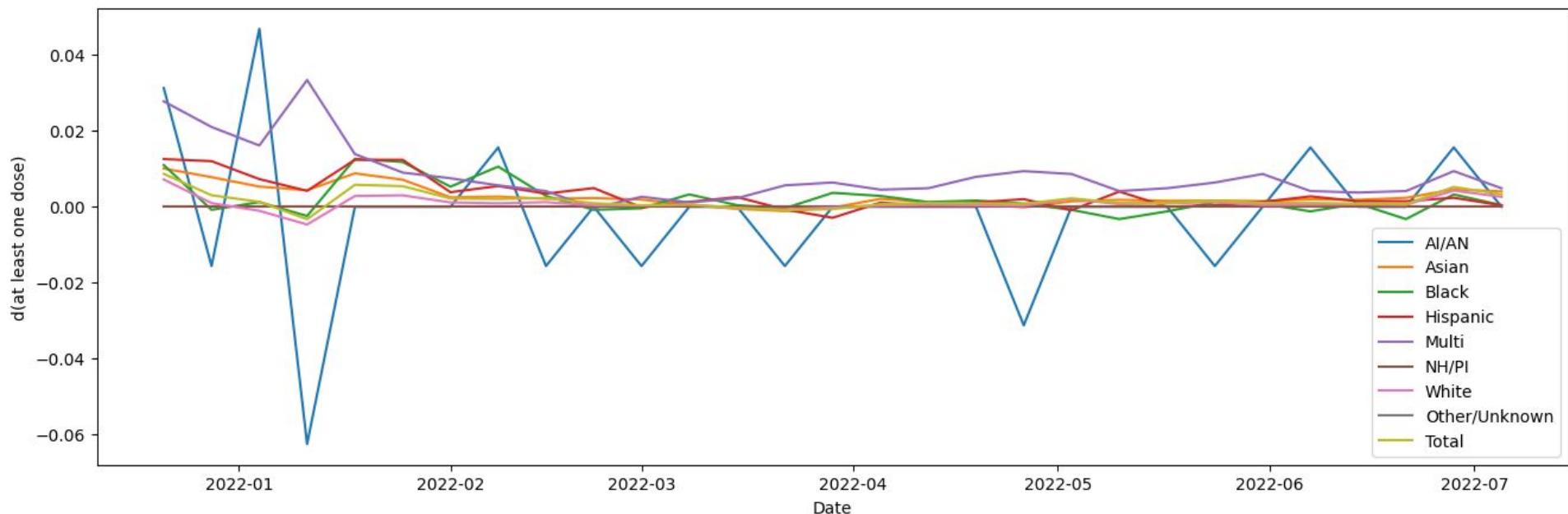


# Booster 1 Rollout

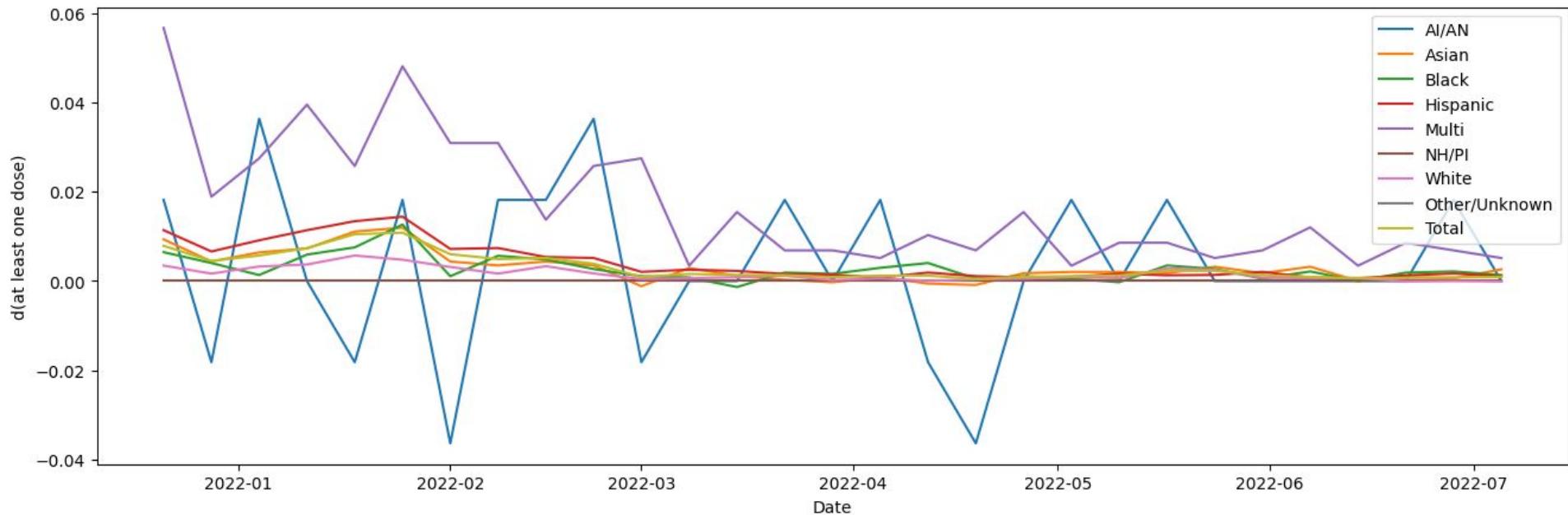
Chelsea: data vs rate of at least 1 dose



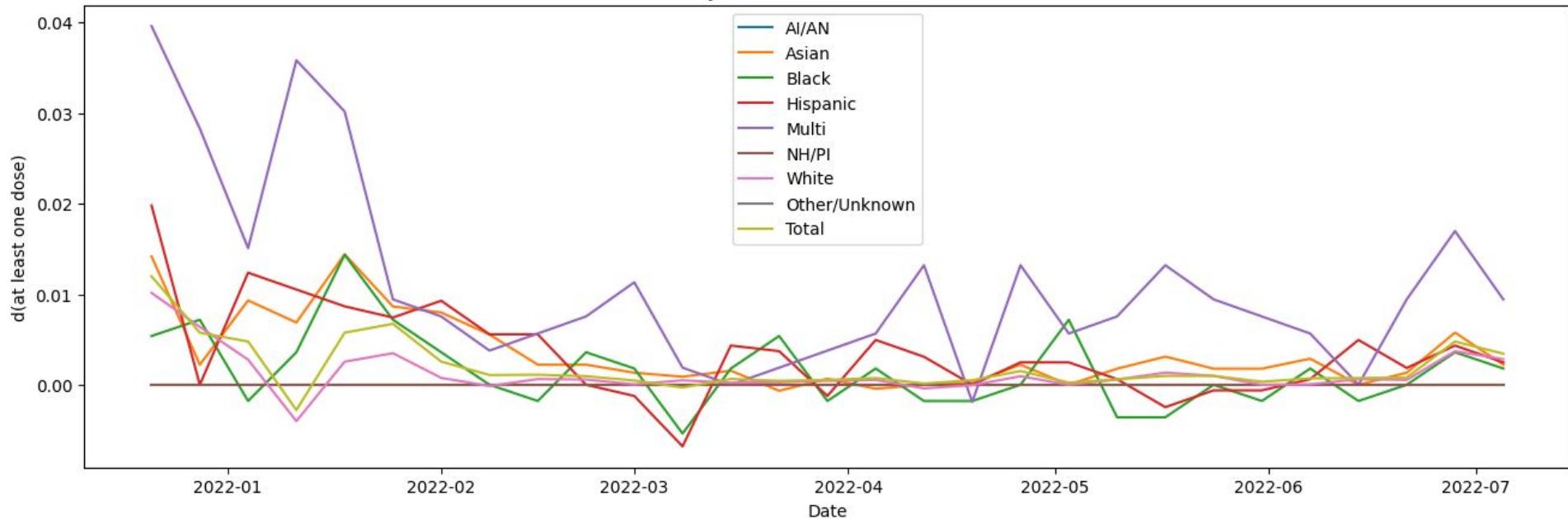
Newton: data vs rate of at least 1 dose



### Revere: data vs rate of at least 1 dose

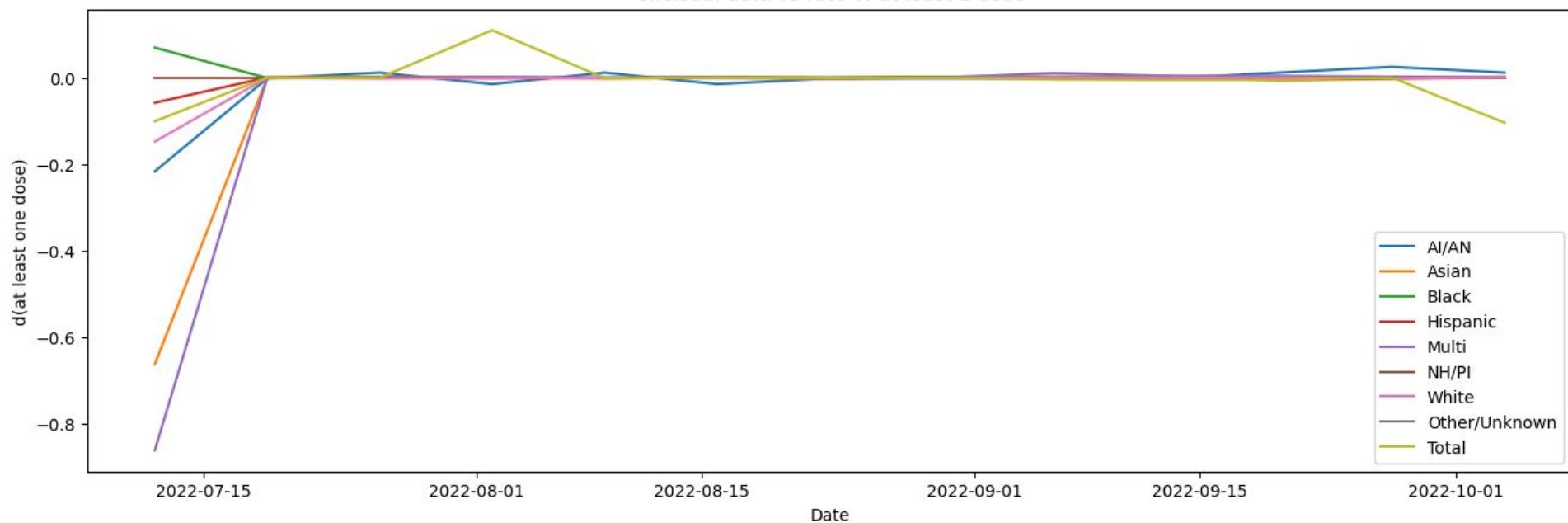


Wellesley: data vs rate of at least 1 dose

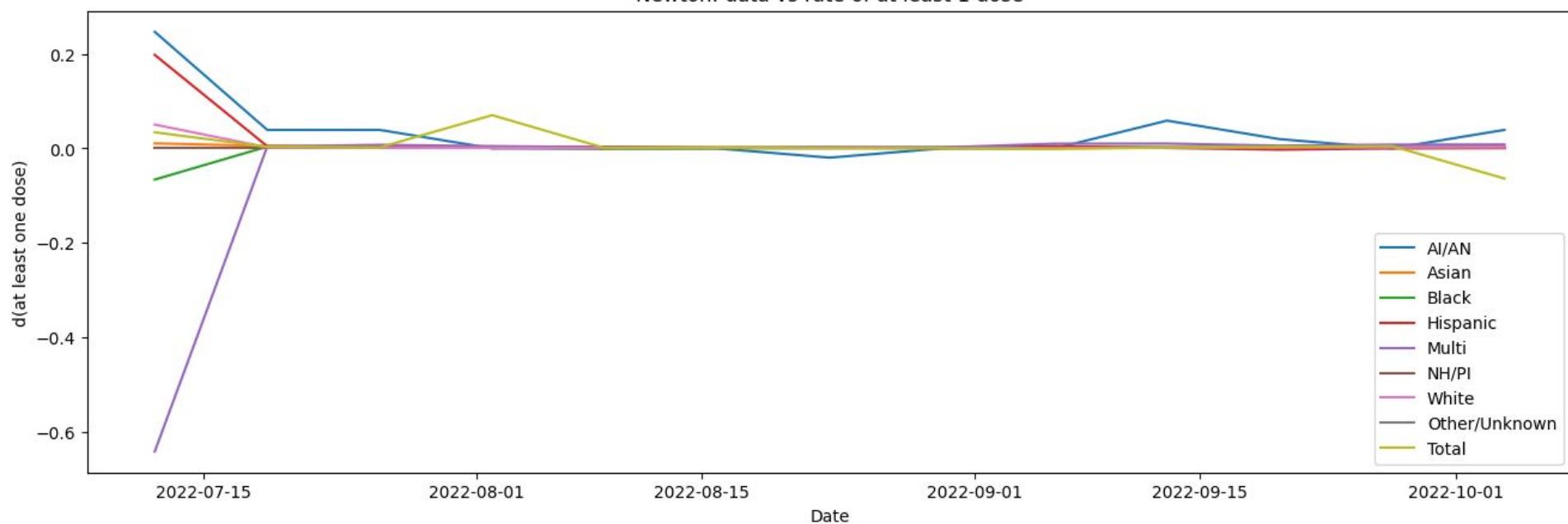


# Booster 2 Rollout

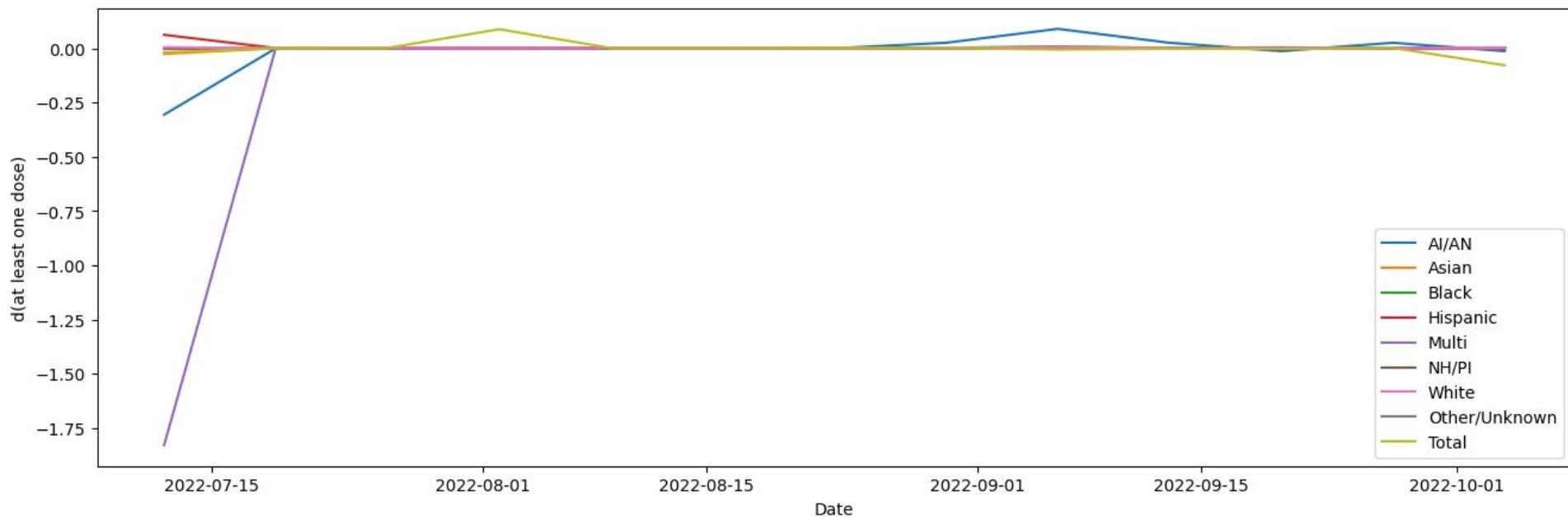
### Chelsea: data vs rate of at least 1 dose



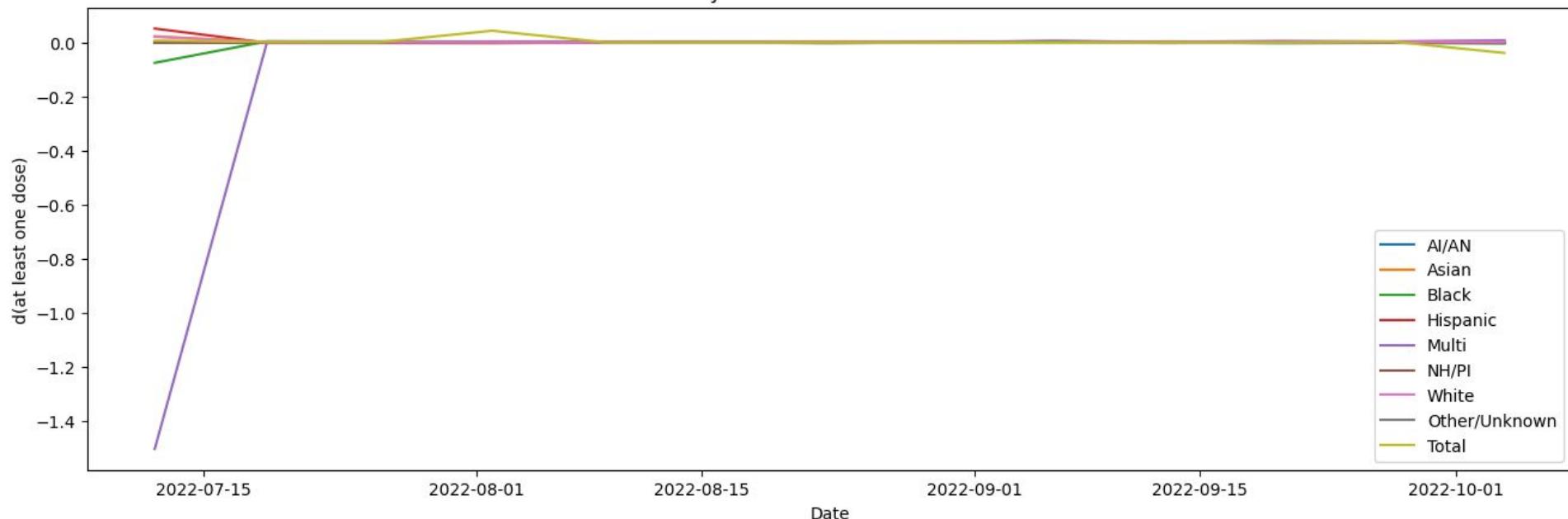
Newton: data vs rate of at least 1 dose



## Revere: data vs rate of at least 1 dose



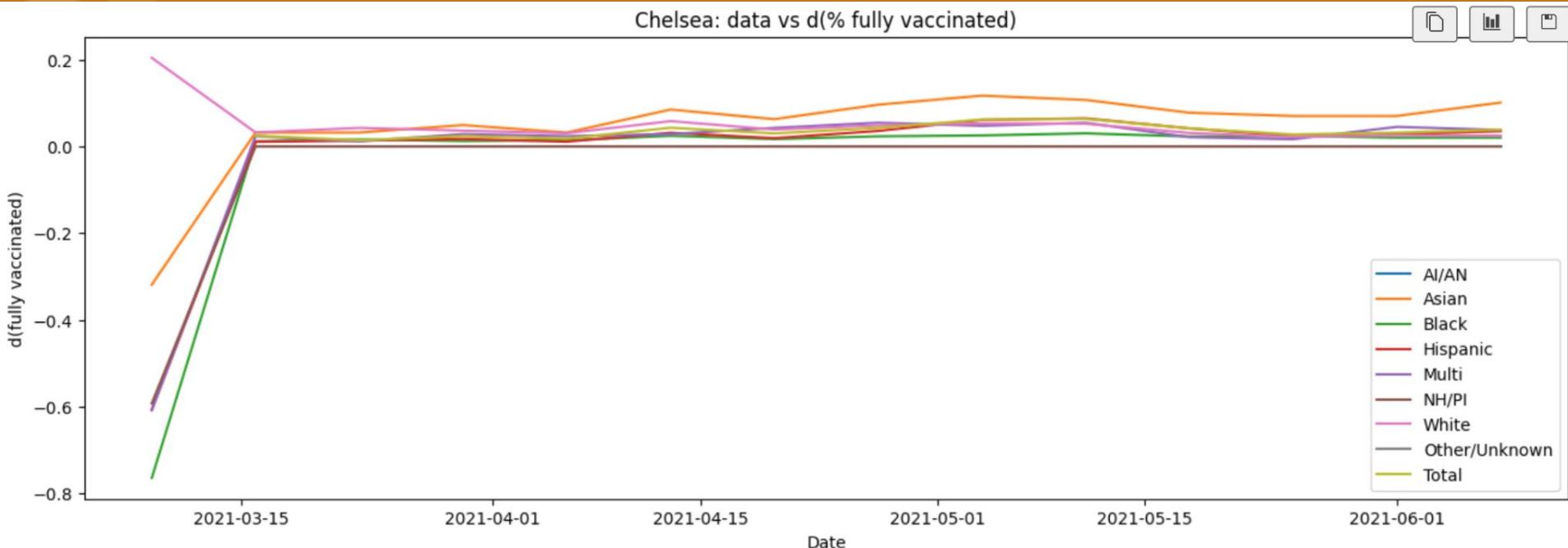
### Wellesley: data vs rate of at least 1 dose



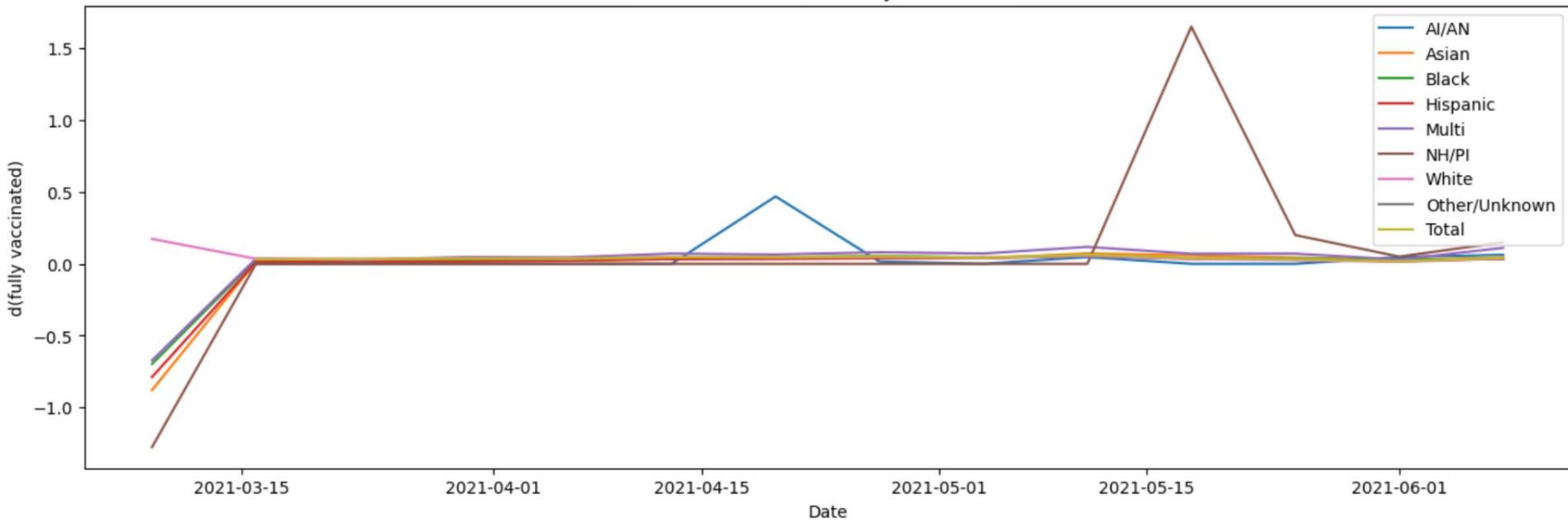
# **Data vs. Rate of % Fully Vaccinated by Race**

Each line corresponds to a race, and each graph corresponds to a region.

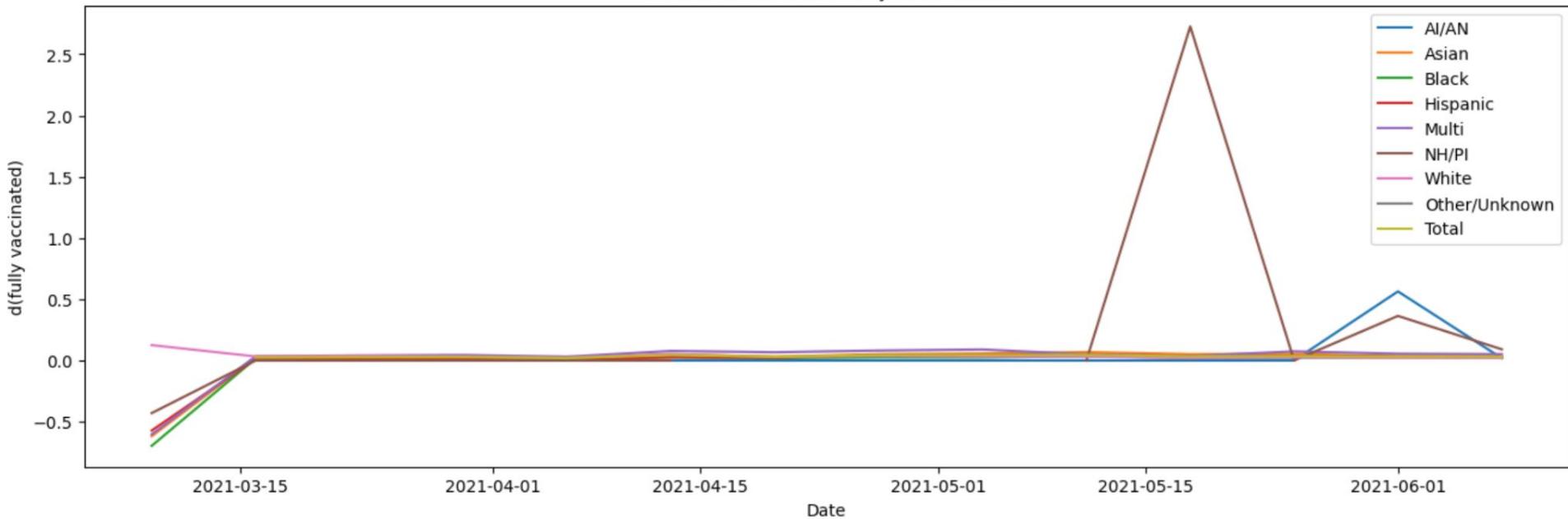
# Early Vaccine Rollout



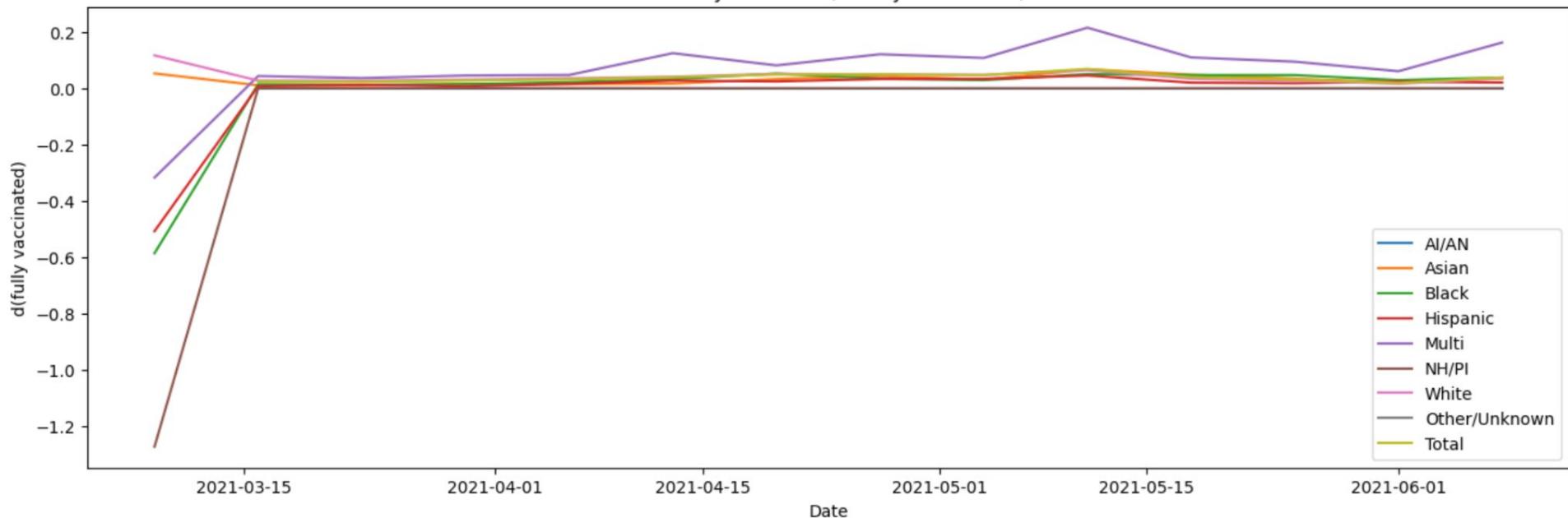
Newton: data vs d(% fully vaccinated)



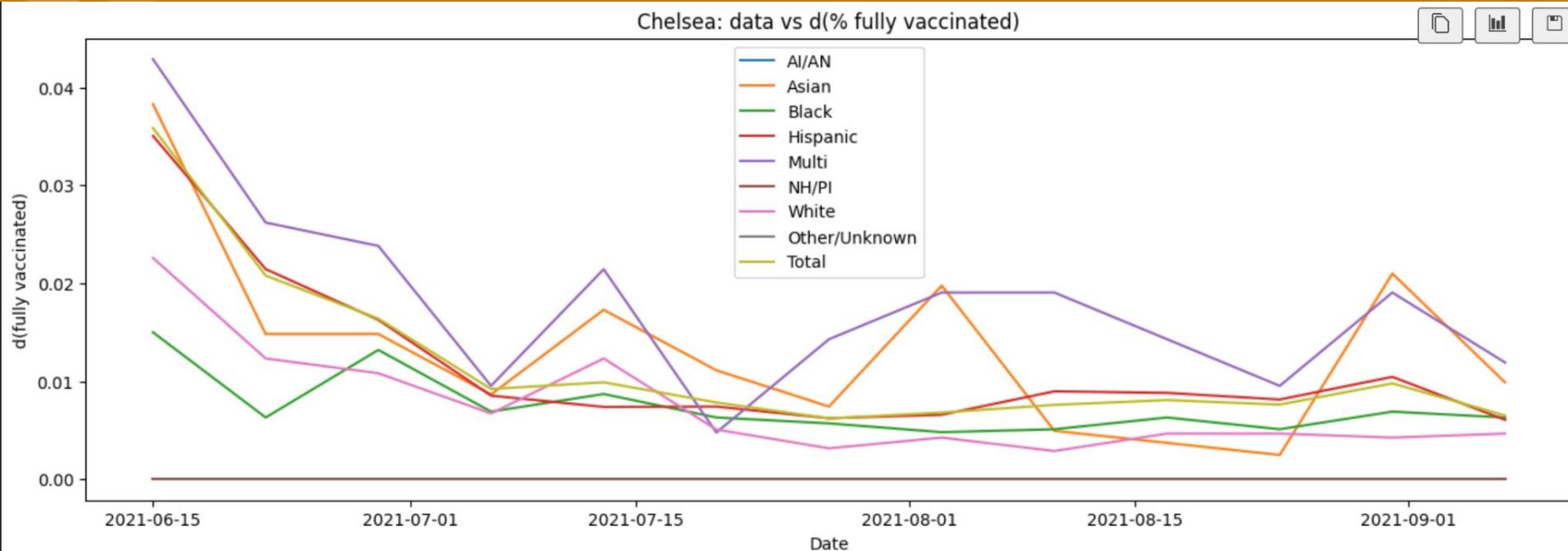
### Revere: data vs d(% fully vaccinated)



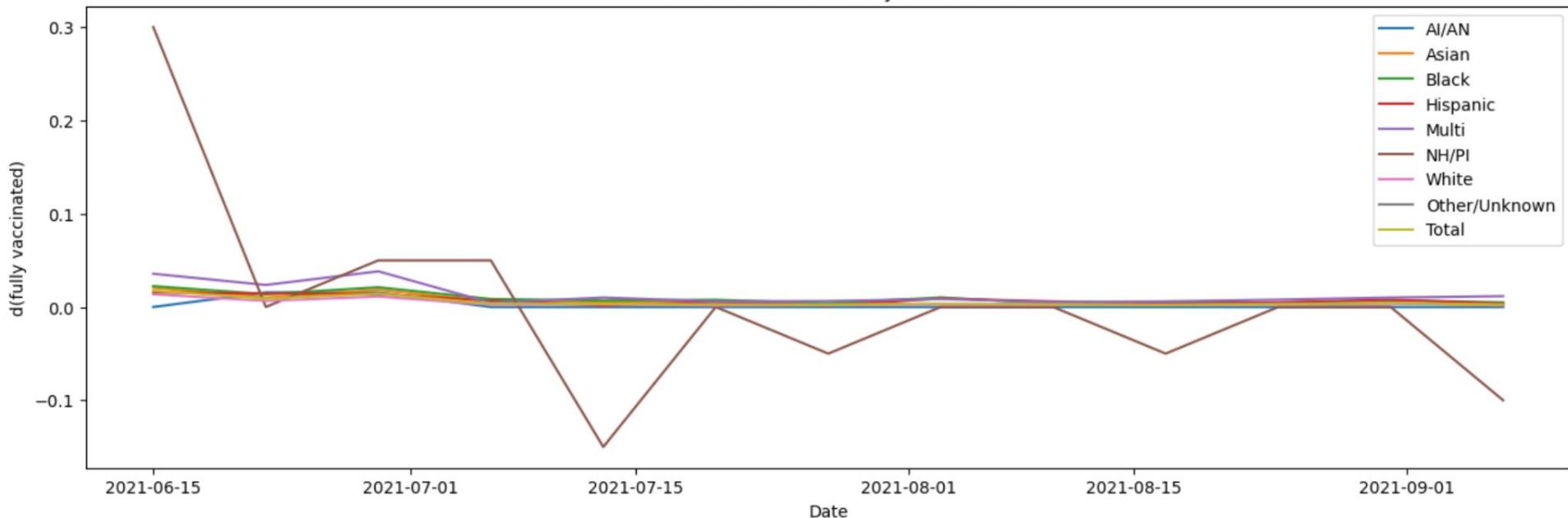
### Wellesley: data vs d(% fully vaccinated)



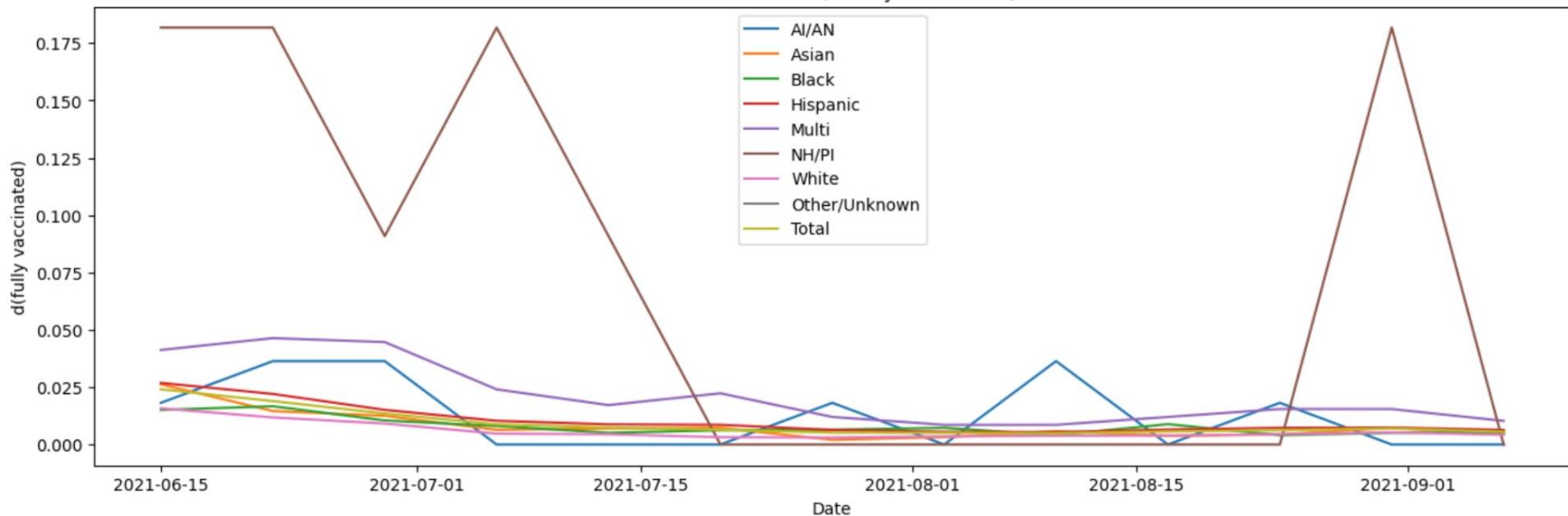
# Middle Vaccine Rollout



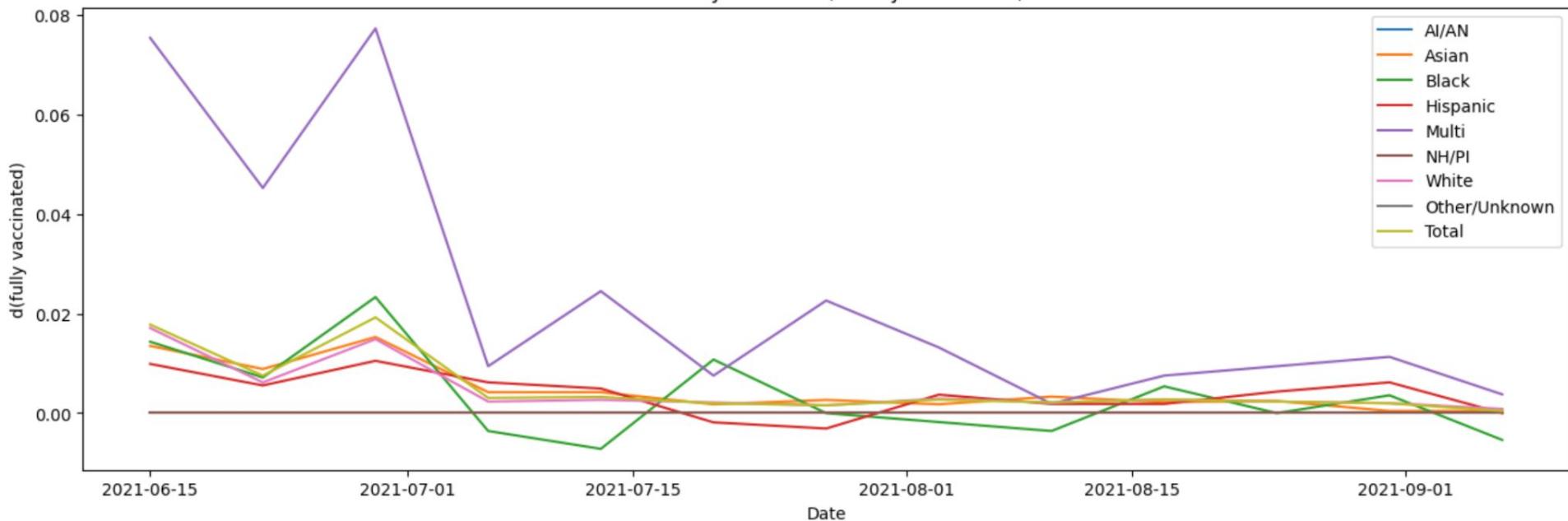
Newton: data vs d(% fully vaccinated)



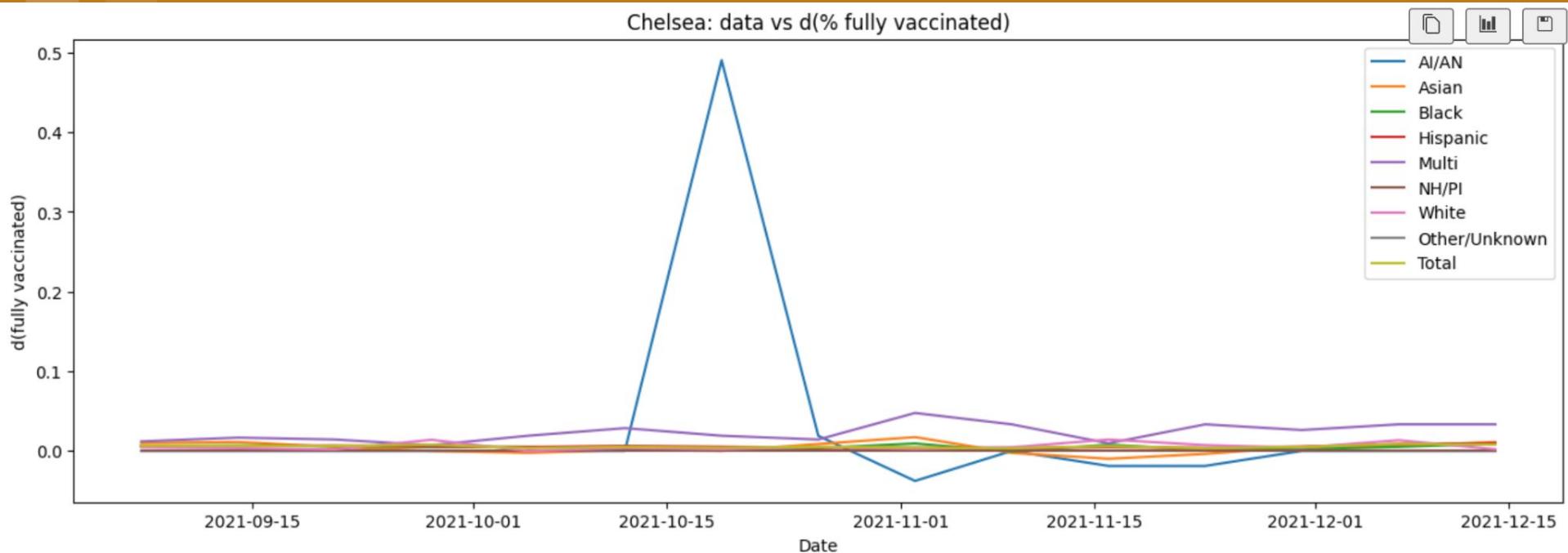
Revere: data vs d(% fully vaccinated)



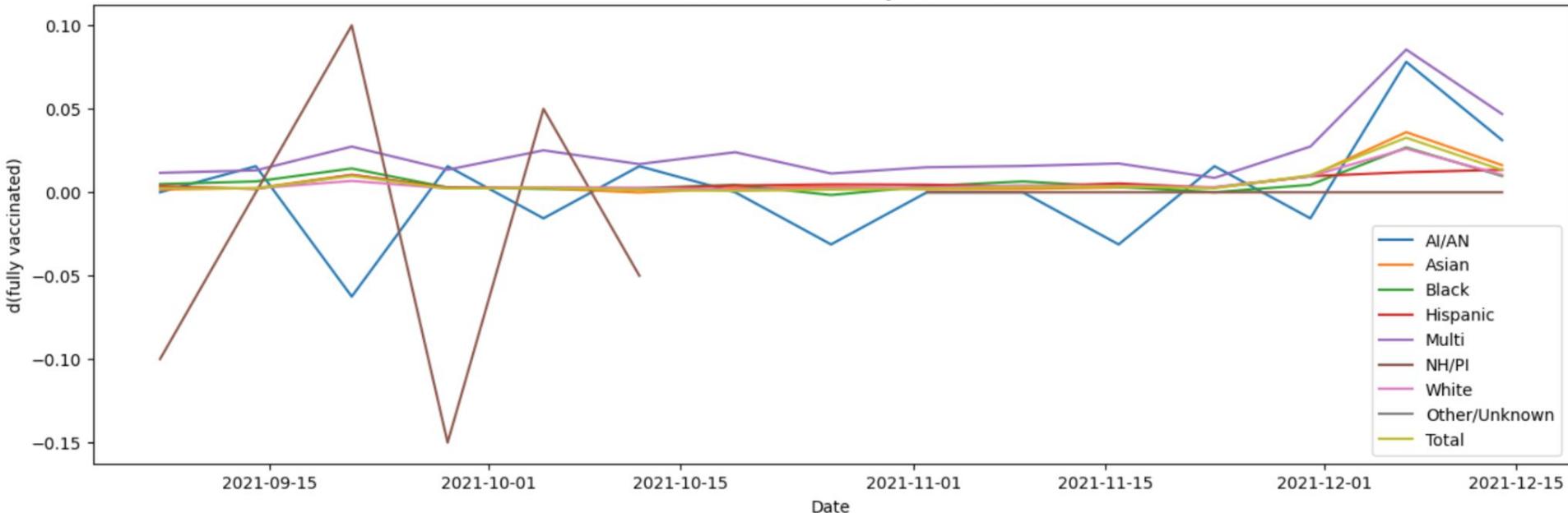
### Wellesley: data vs d(% fully vaccinated)



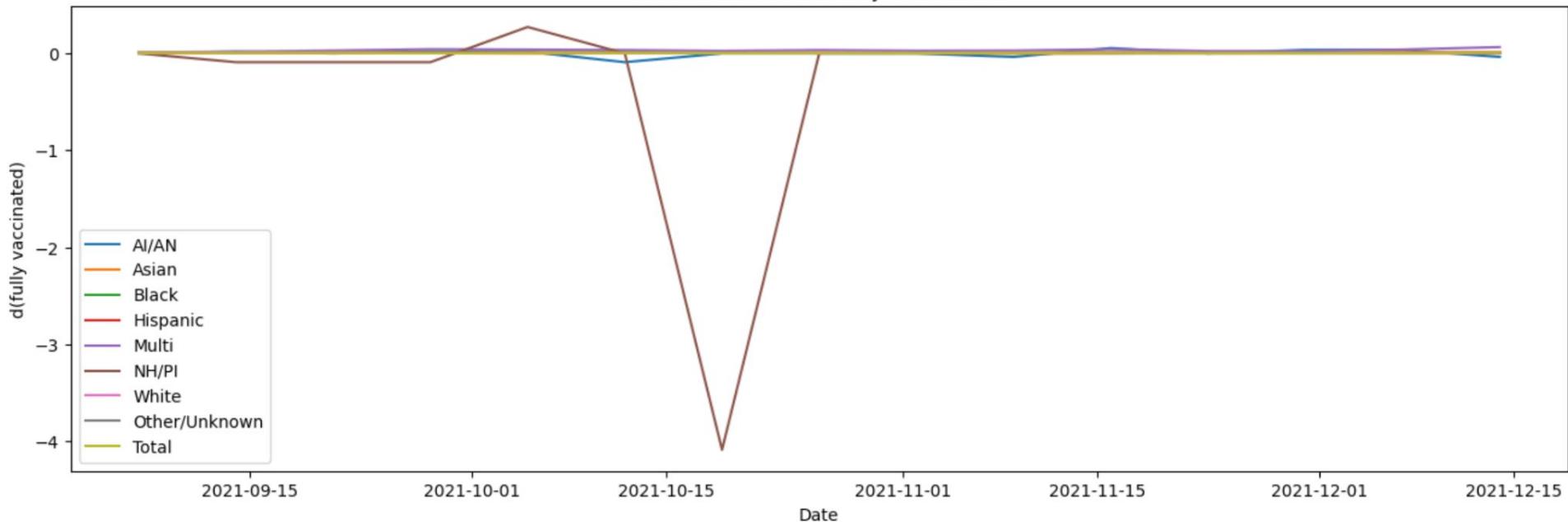
# Late Vaccine Rollout



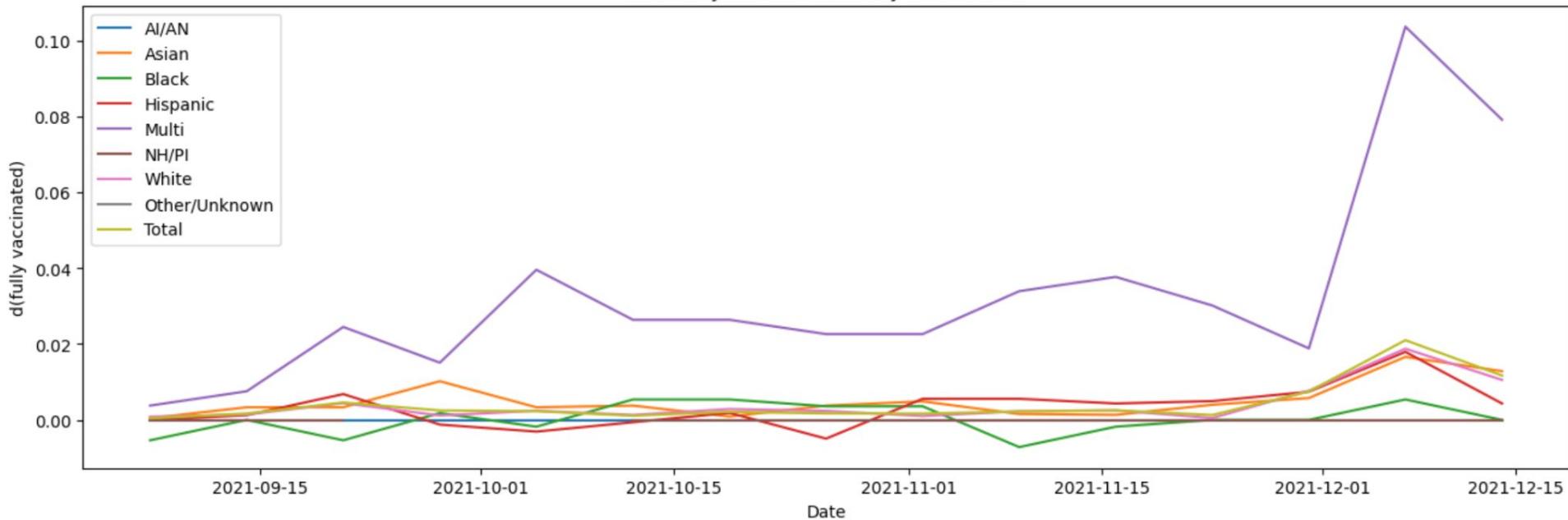
Newton: data vs d(% fully vaccinated)



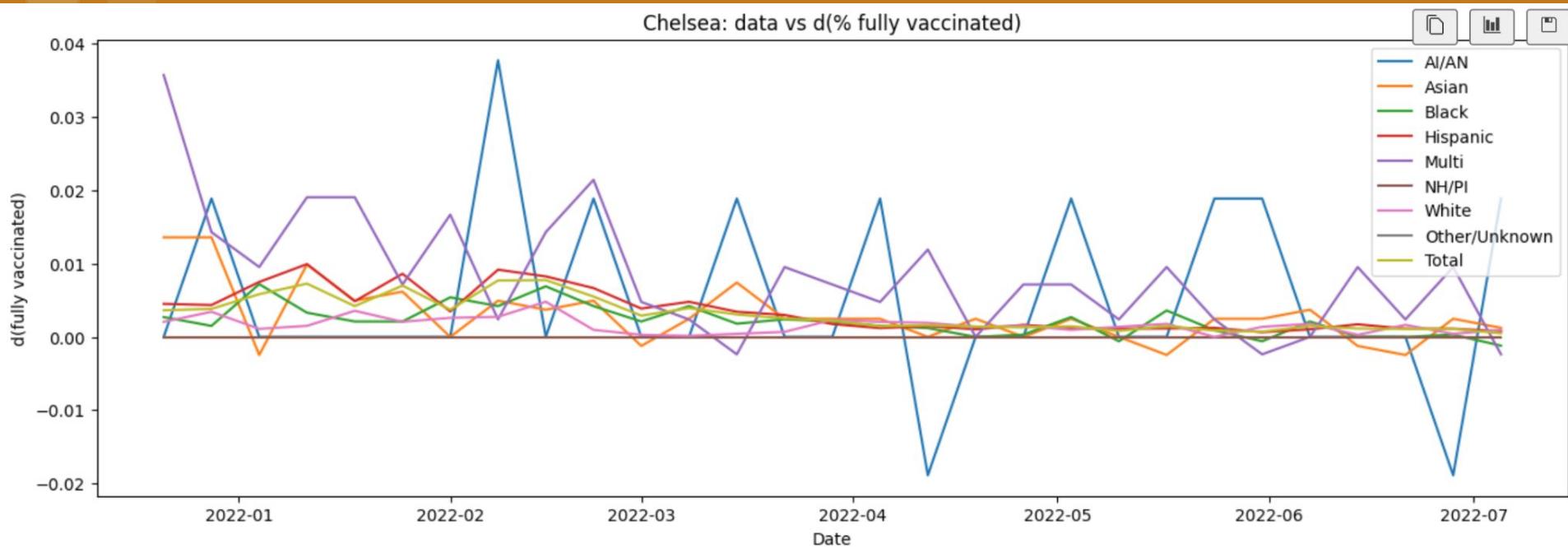
### Revere: data vs d(% fully vaccinated)



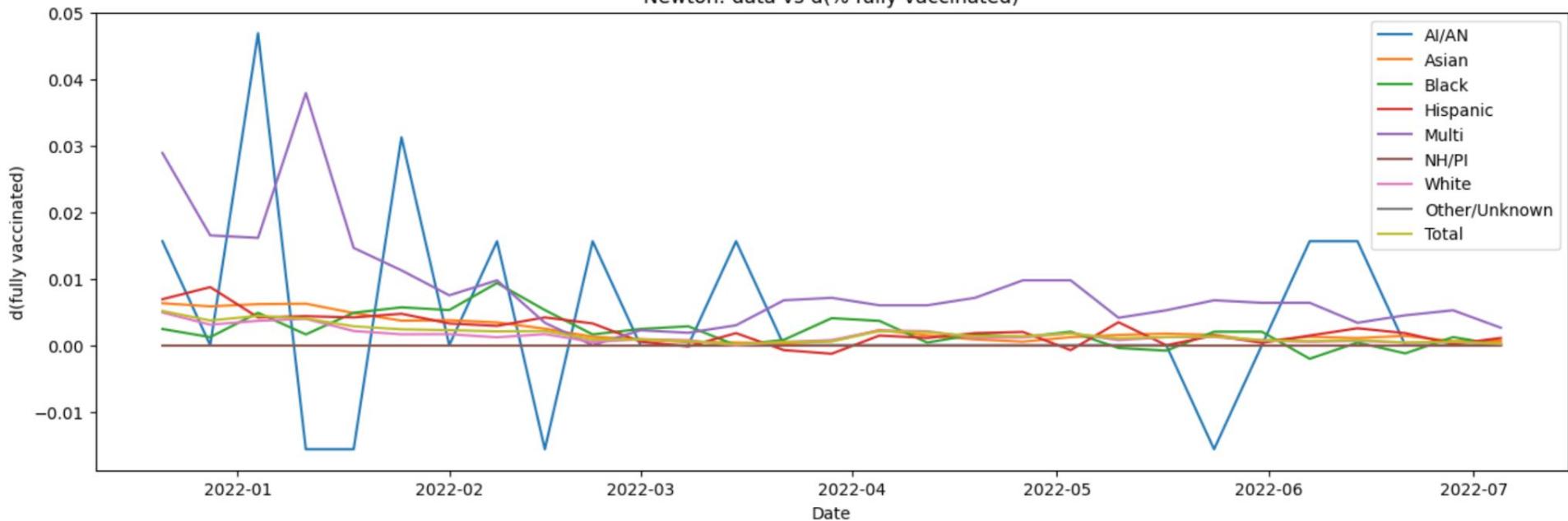
Wellesley: data vs d(% fully vaccinated)



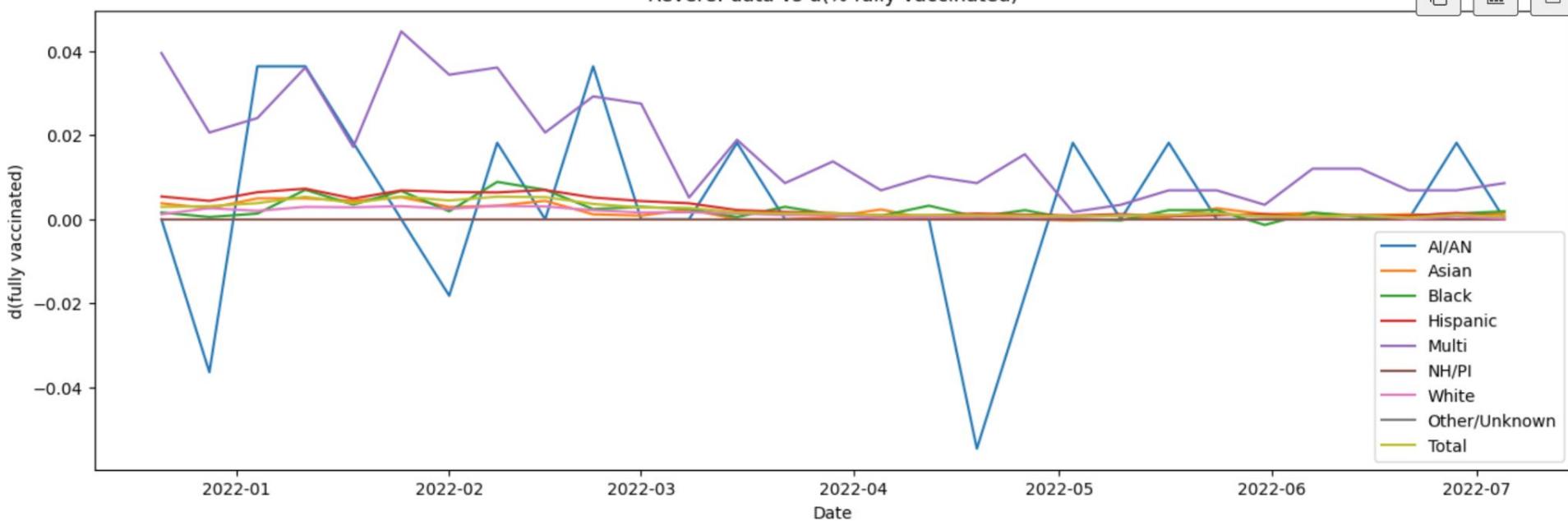
# Booster 1 Rollout



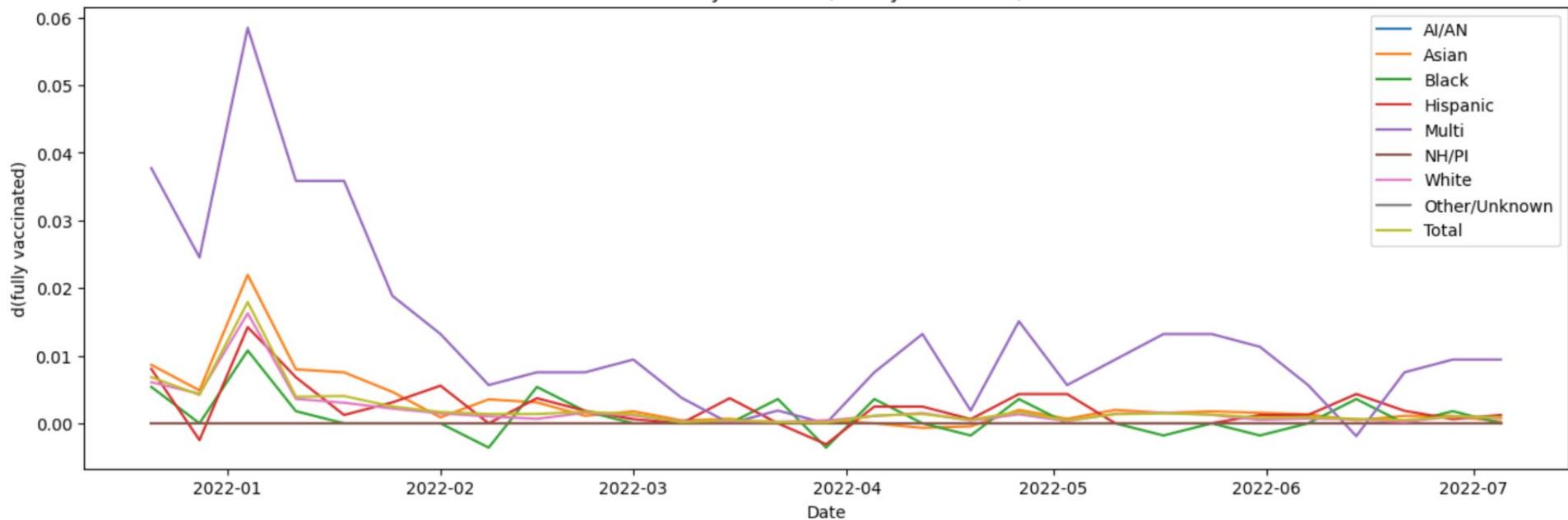
Newton: data vs  $d(\%)$  fully vaccinated)



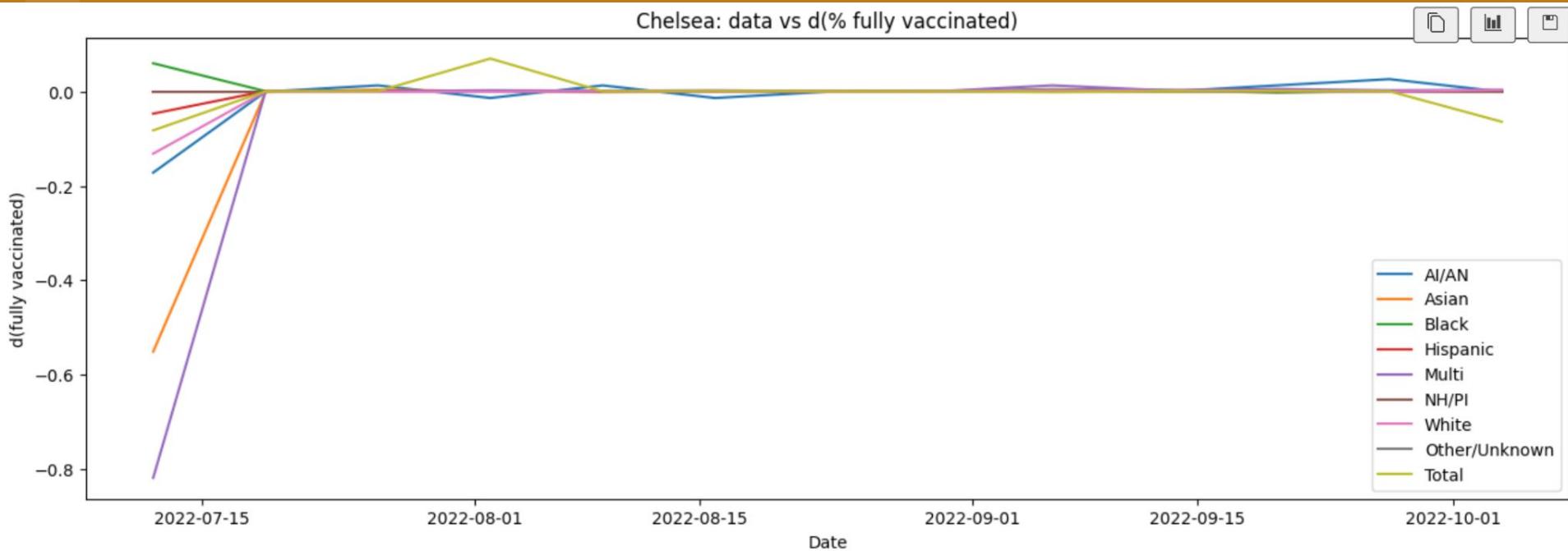
### Revere: data vs d(% fully vaccinated)



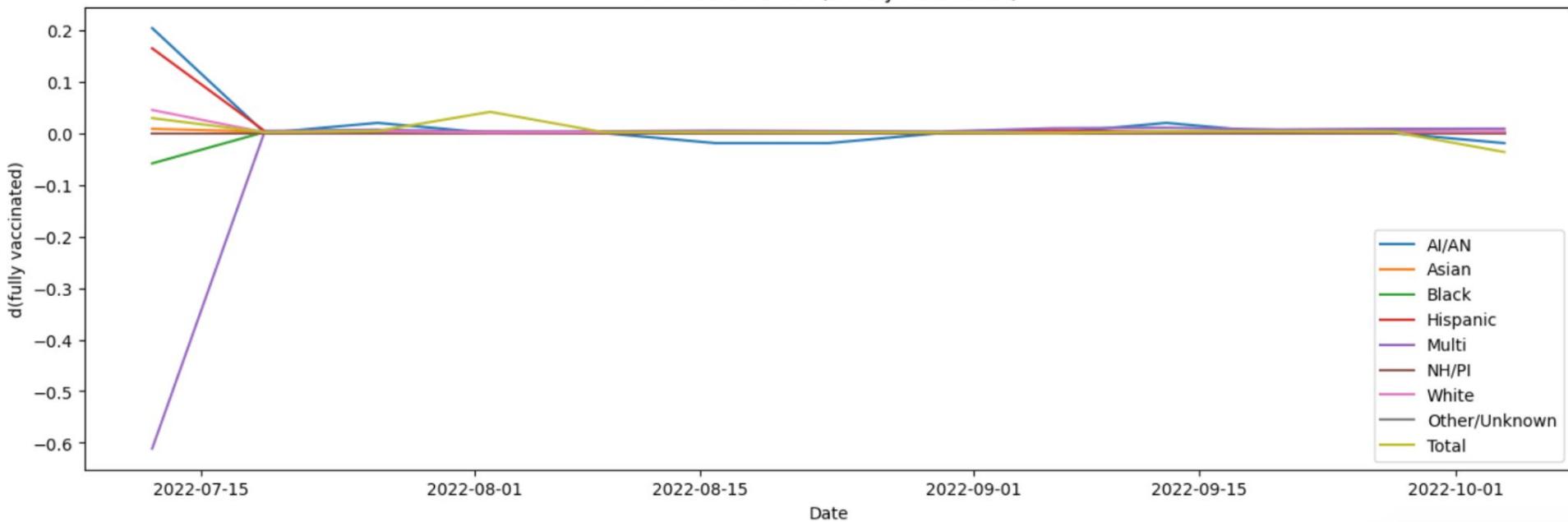
### Wellesley: data vs d(% fully vaccinated)



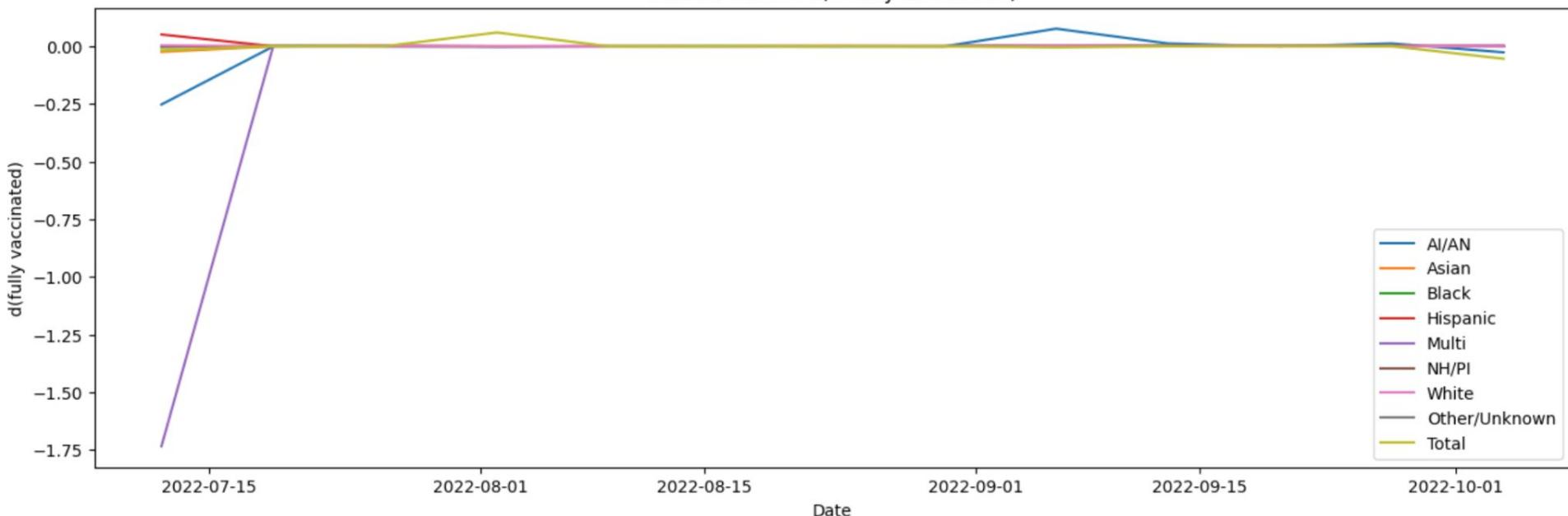
# Booster 2 Rollout



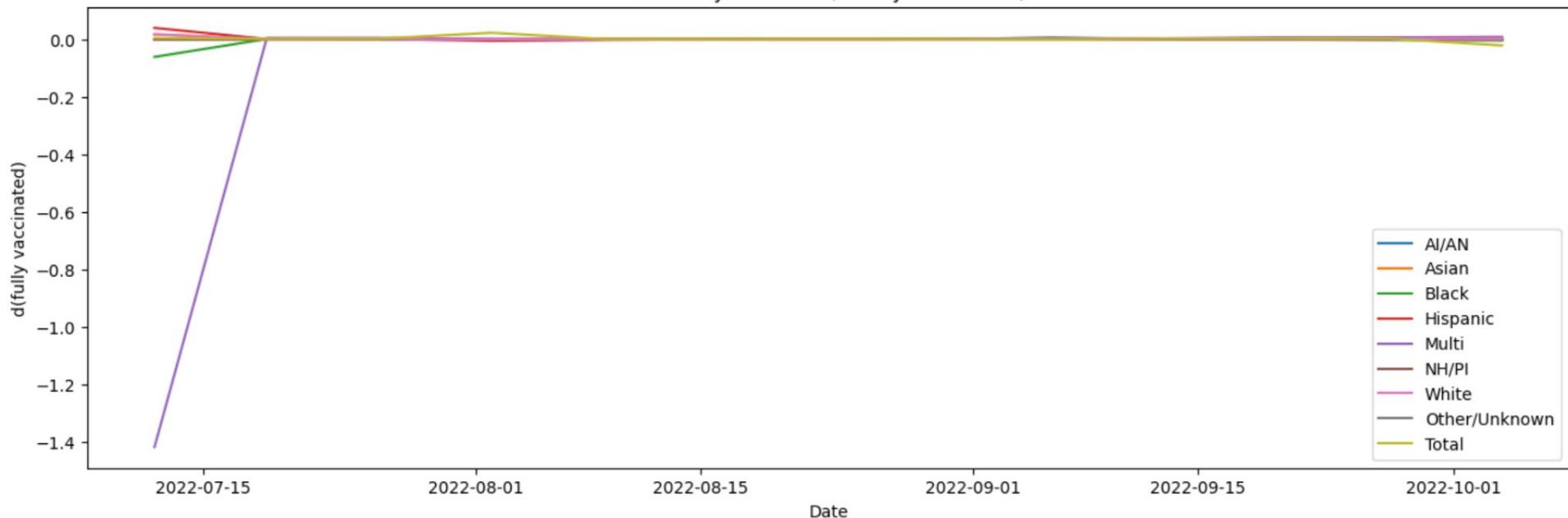
### Newton: data vs d(% fully vaccinated)



## Revere: data vs d(% fully vaccinated)



### Wellesley: data vs d(% fully vaccinated)





# Challenges, Limitations

Some of the challenges that we have are directly tying the trends to real life events. As shown in the graphs above, there are a number of points where there are significant drops or spikes in rate - possibly because of some real life event.

Without a timeline of La Colaborativa, we cannot show an exact timeline of what happened with these rates.

Difficulty seeing very early trends as I think our early Covid time interval is too long. Need to reanalyze with smaller time interval.



# Next steps

We intend to reanalyze early COVID vaccine rollouts over a shorter interval.

Tying some real life events to explain the timeline.

Figure out other data visualizations to better represent and understand the data.

Try find another dataset and analyze other trends.