Week 11

Update the data before

1. L452R

L452R, BA.2

L452R,BA.5

L452R,BF.7
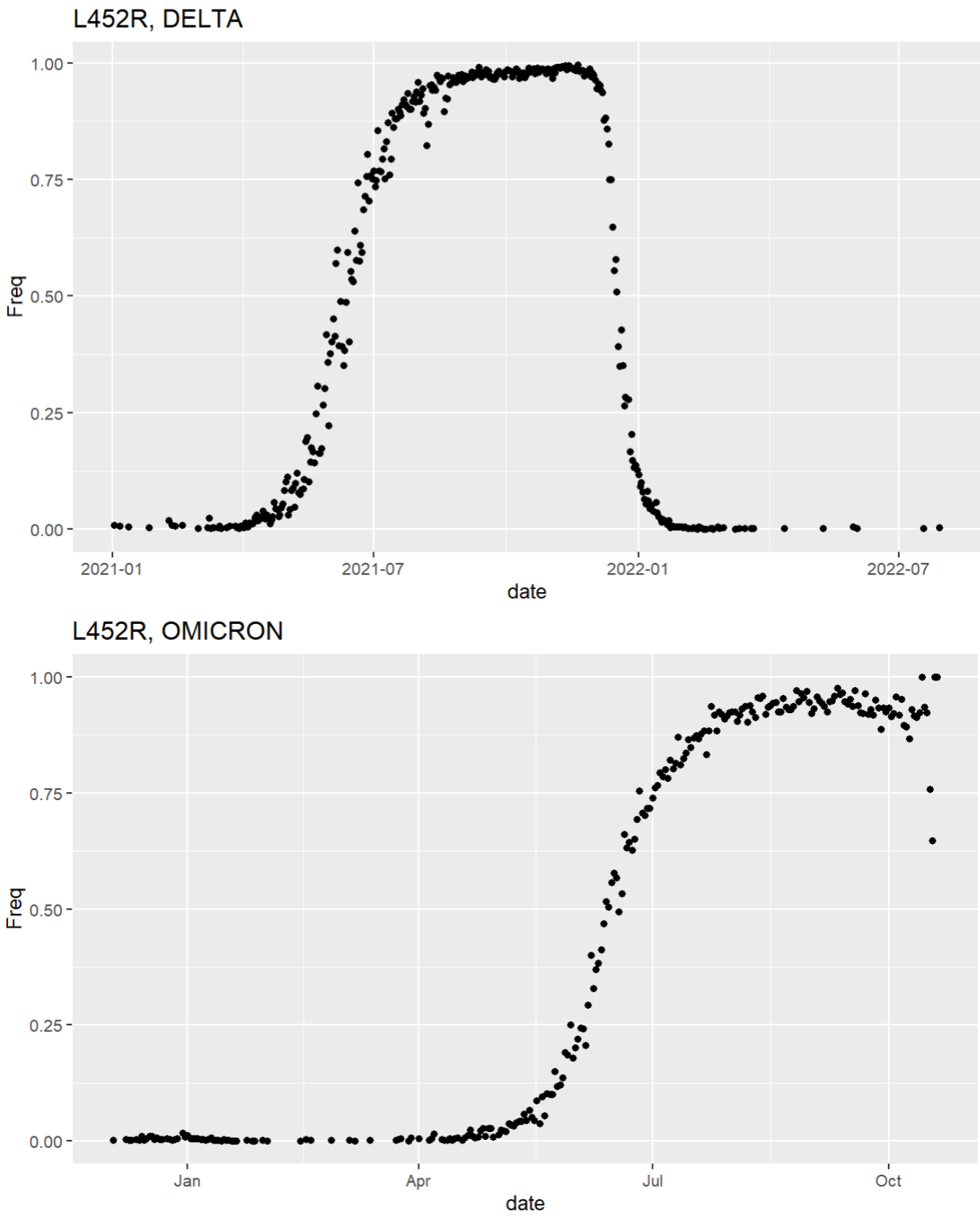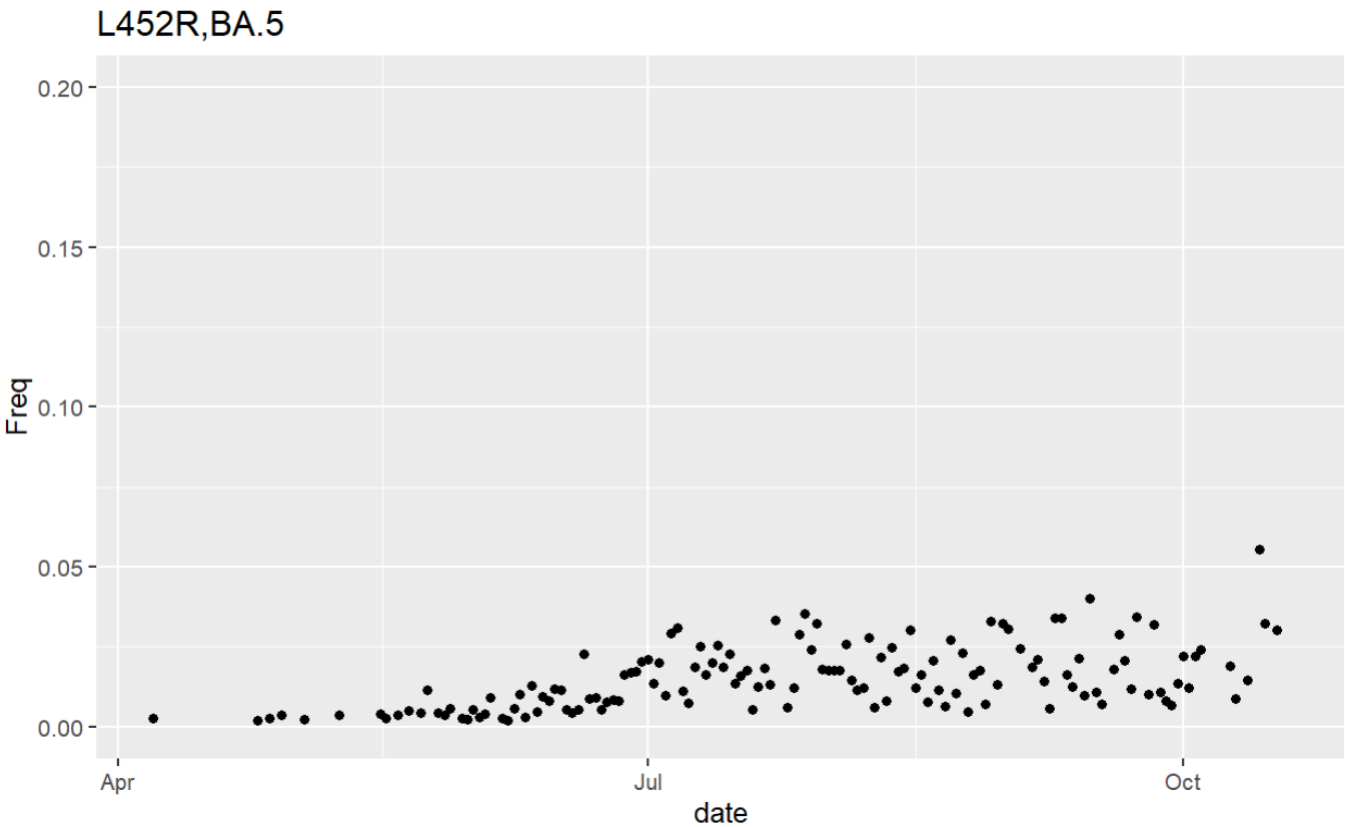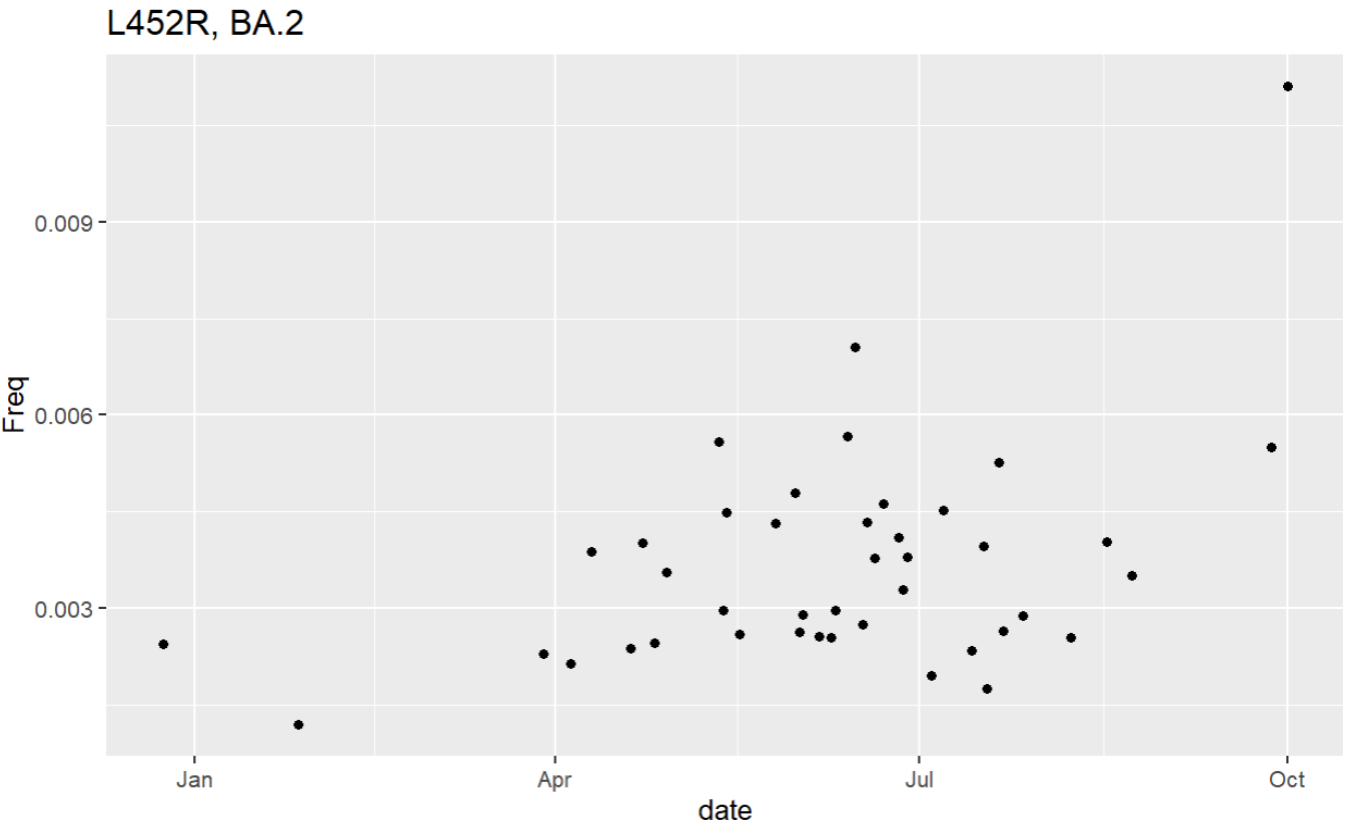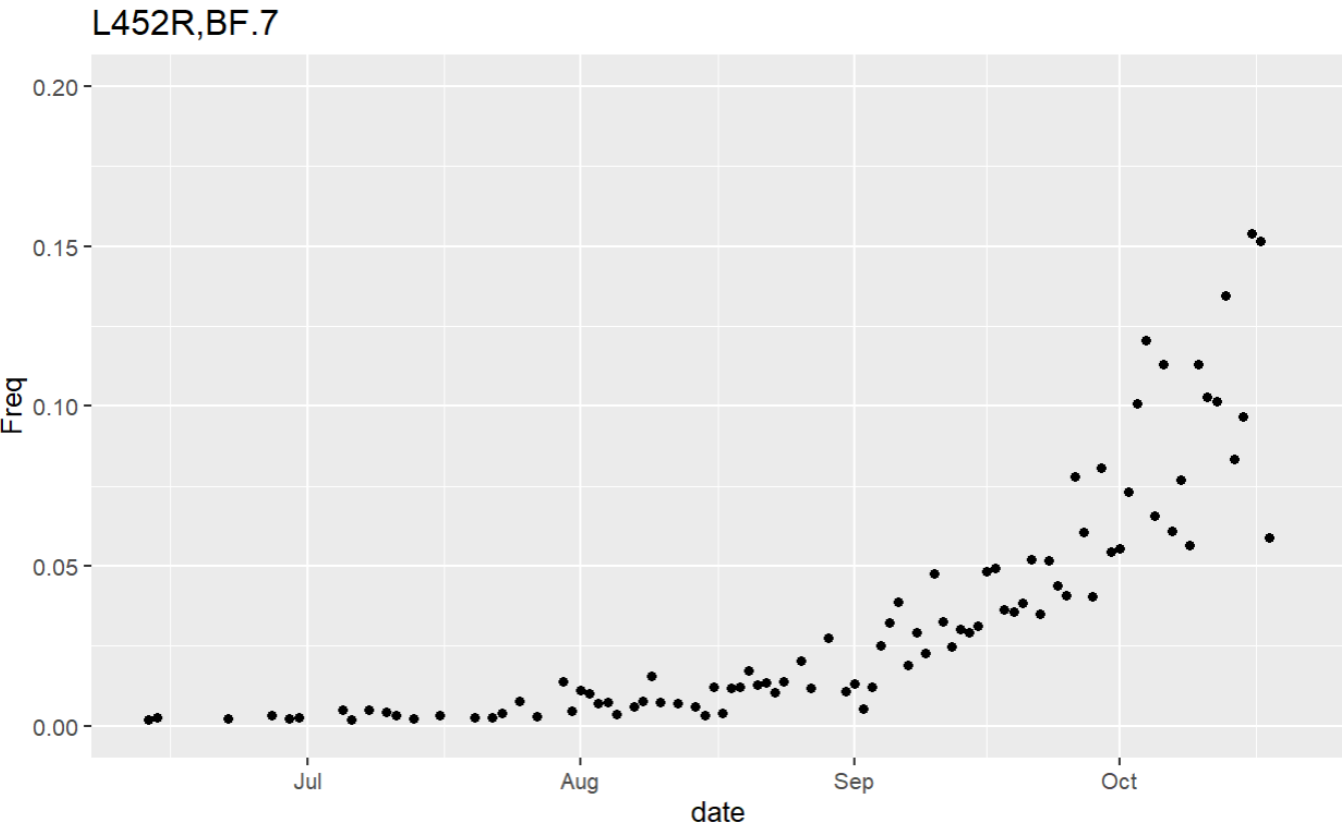
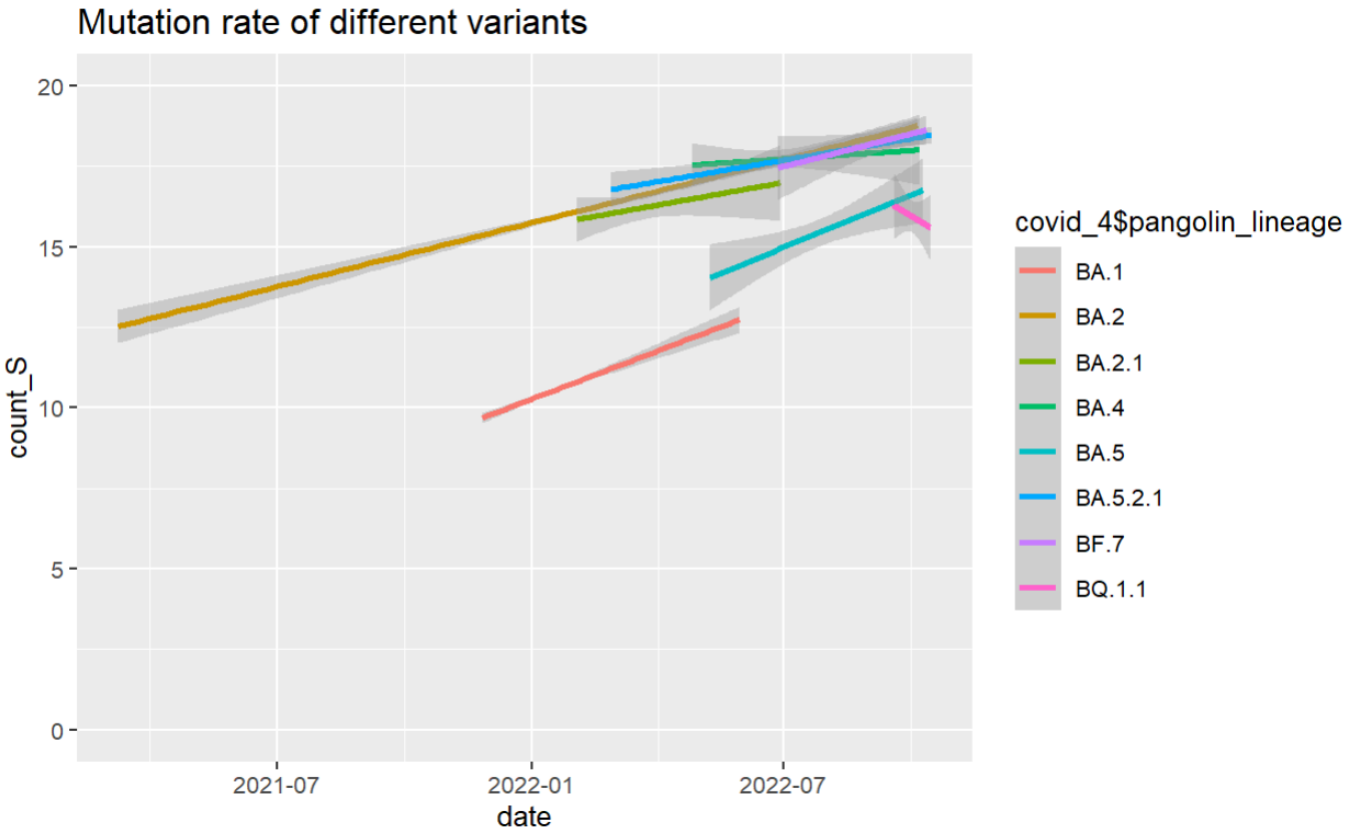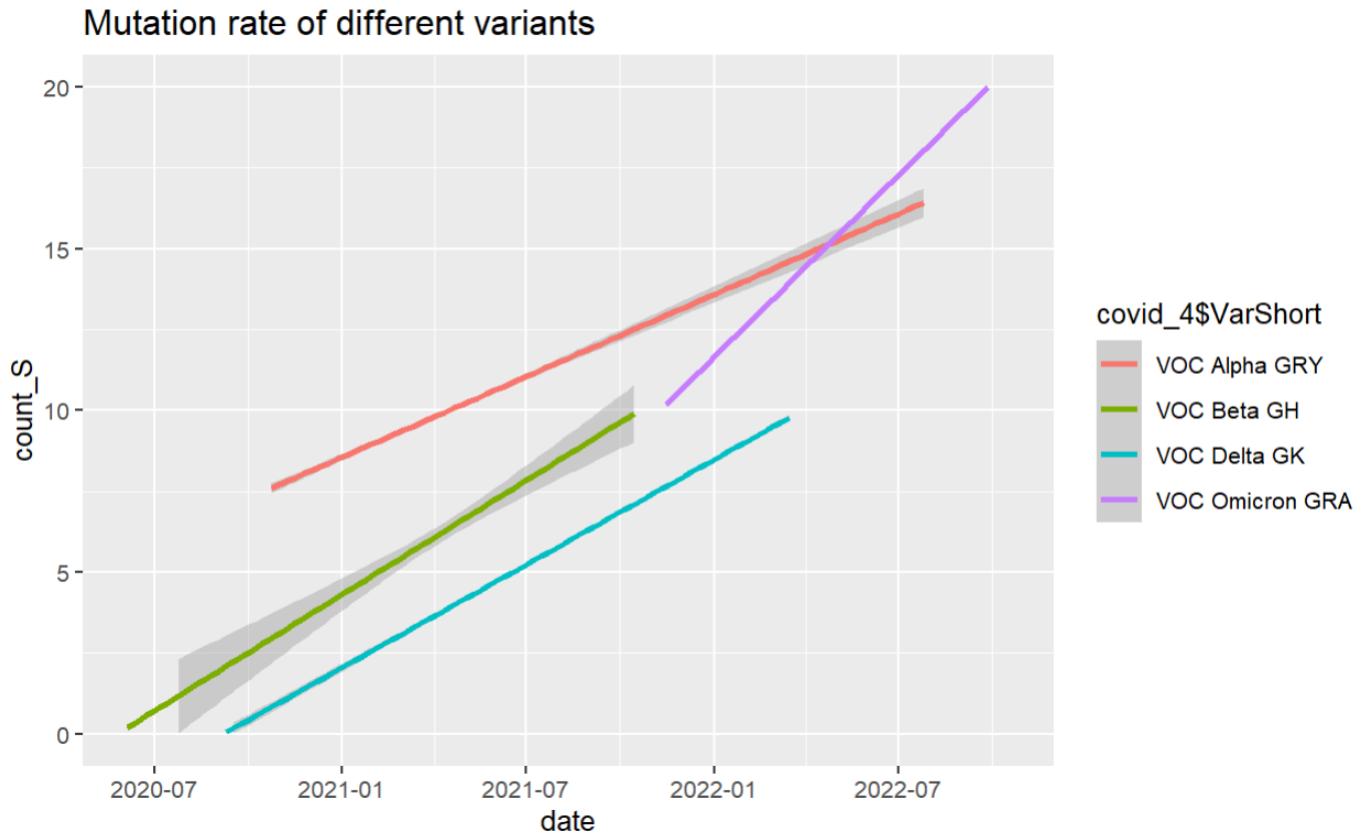
2. PrepViralLineageAmongInfection

Date: after 2022-09-01

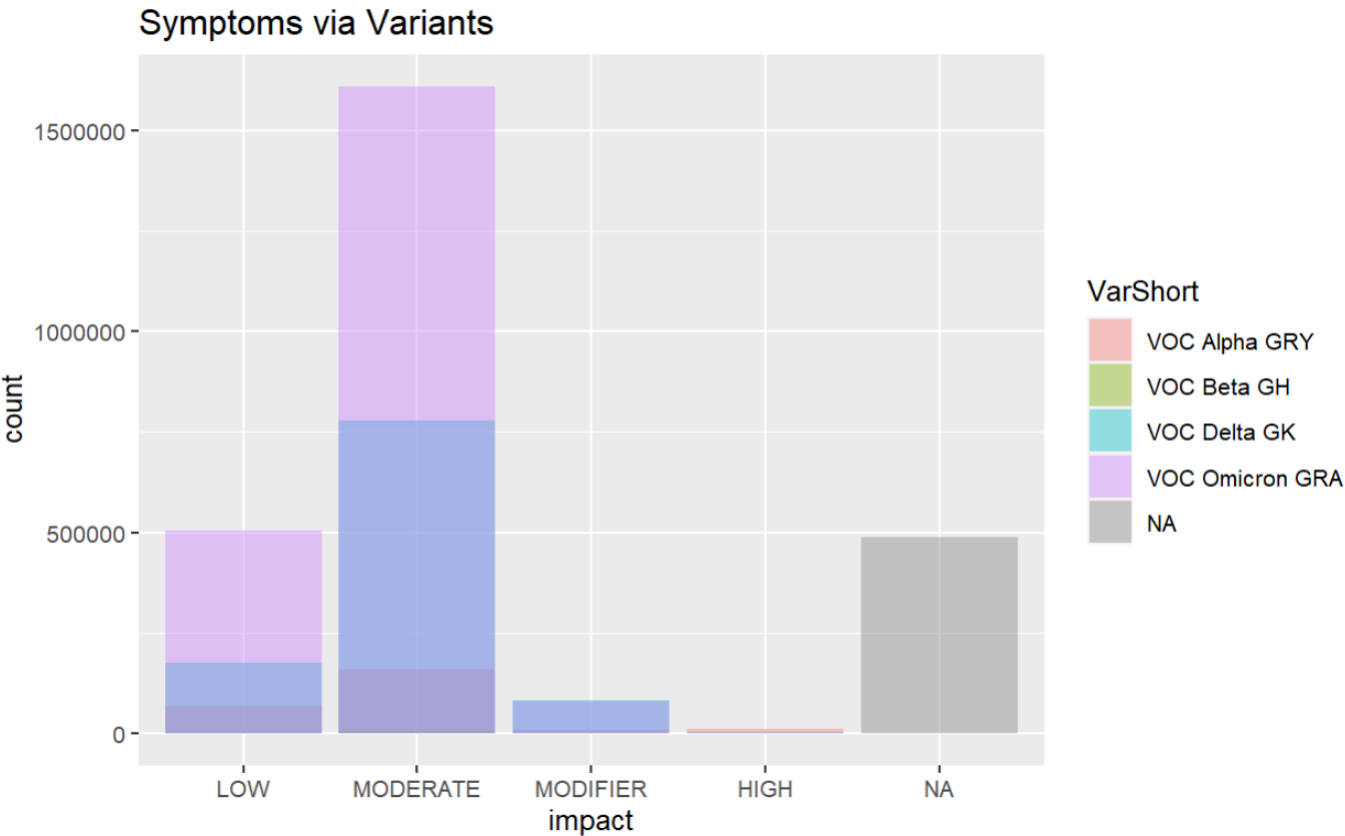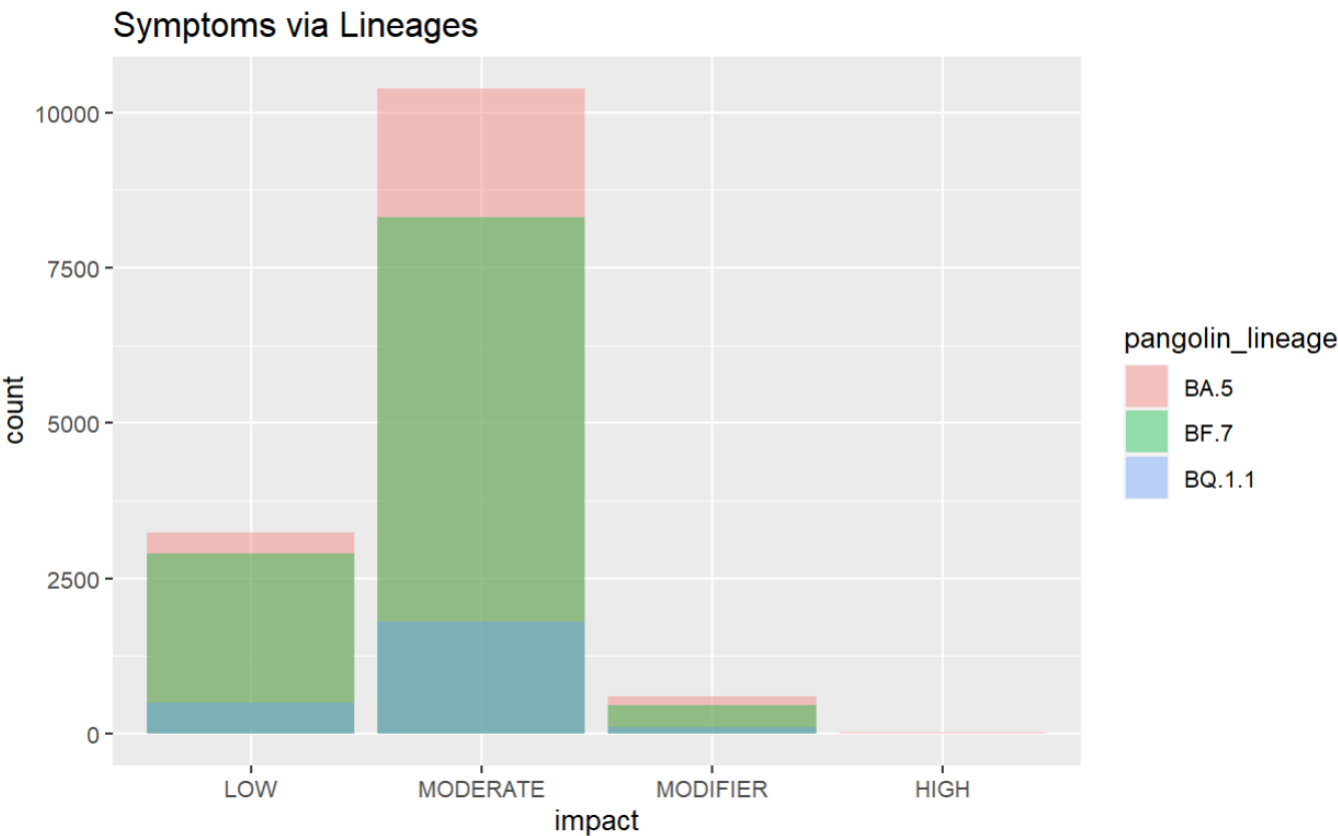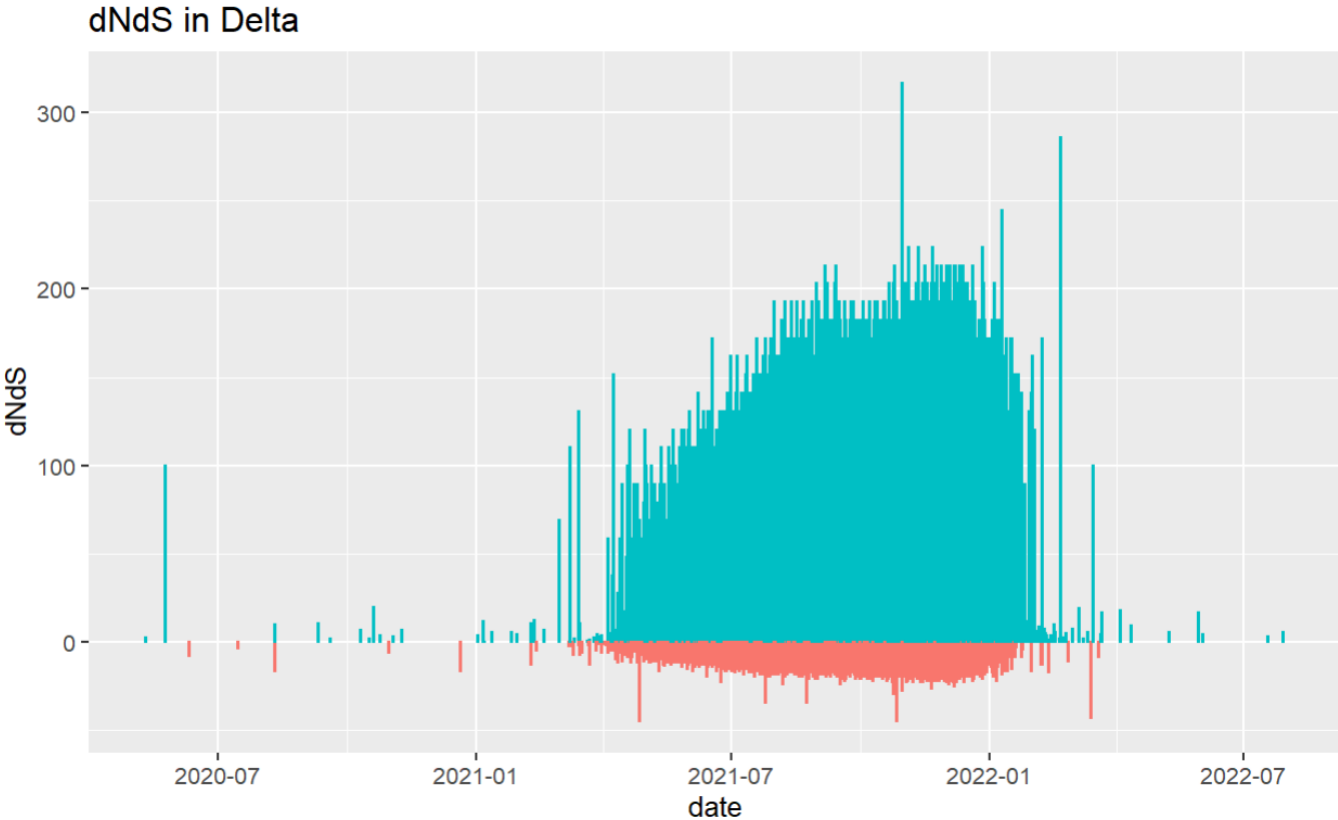## 3. Mutation rate of different *

$y=XW+b$

Mutation rate of different variants

Mutation rate of different variants

4. Symptoms via *

Symptoms via Variants

Symptoms via Lineages_Omicron

Symptoms via Lineages
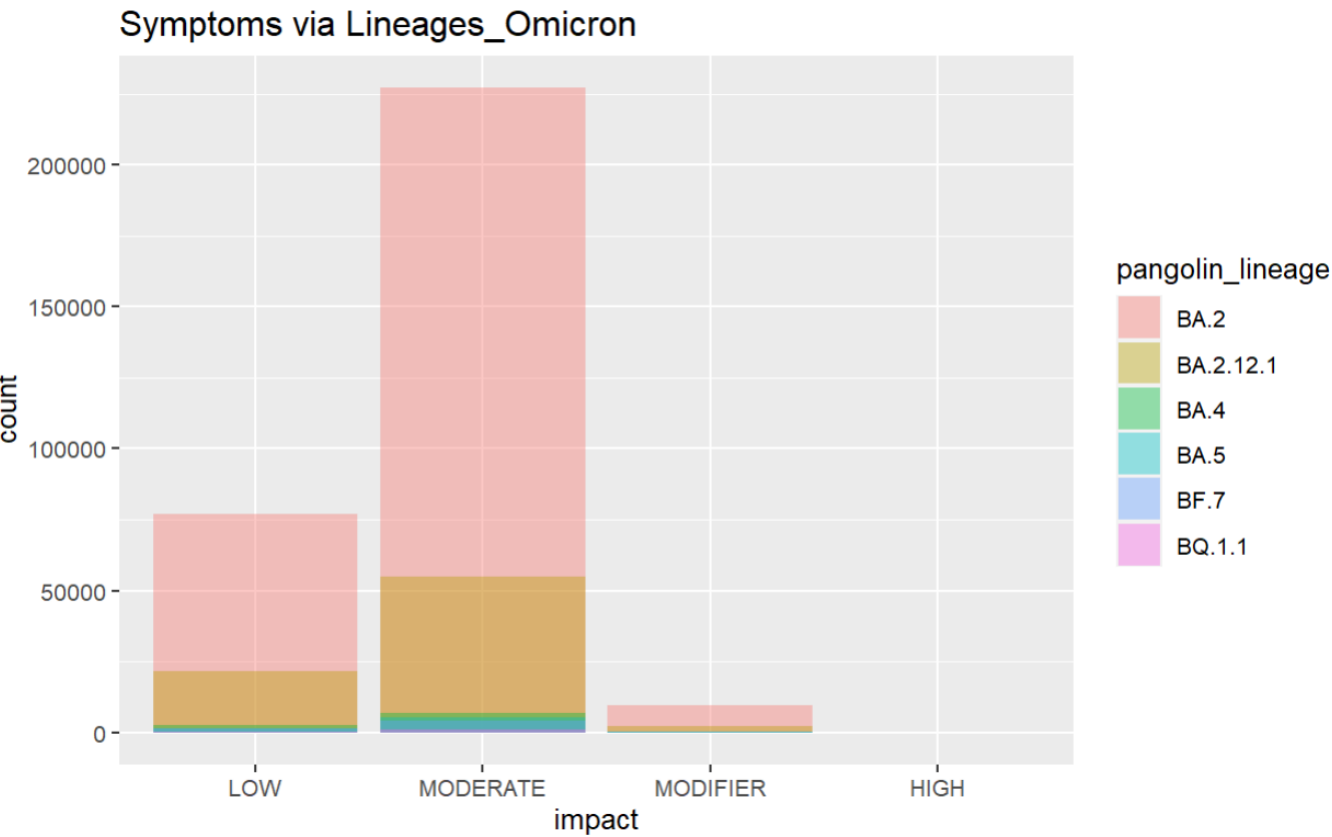
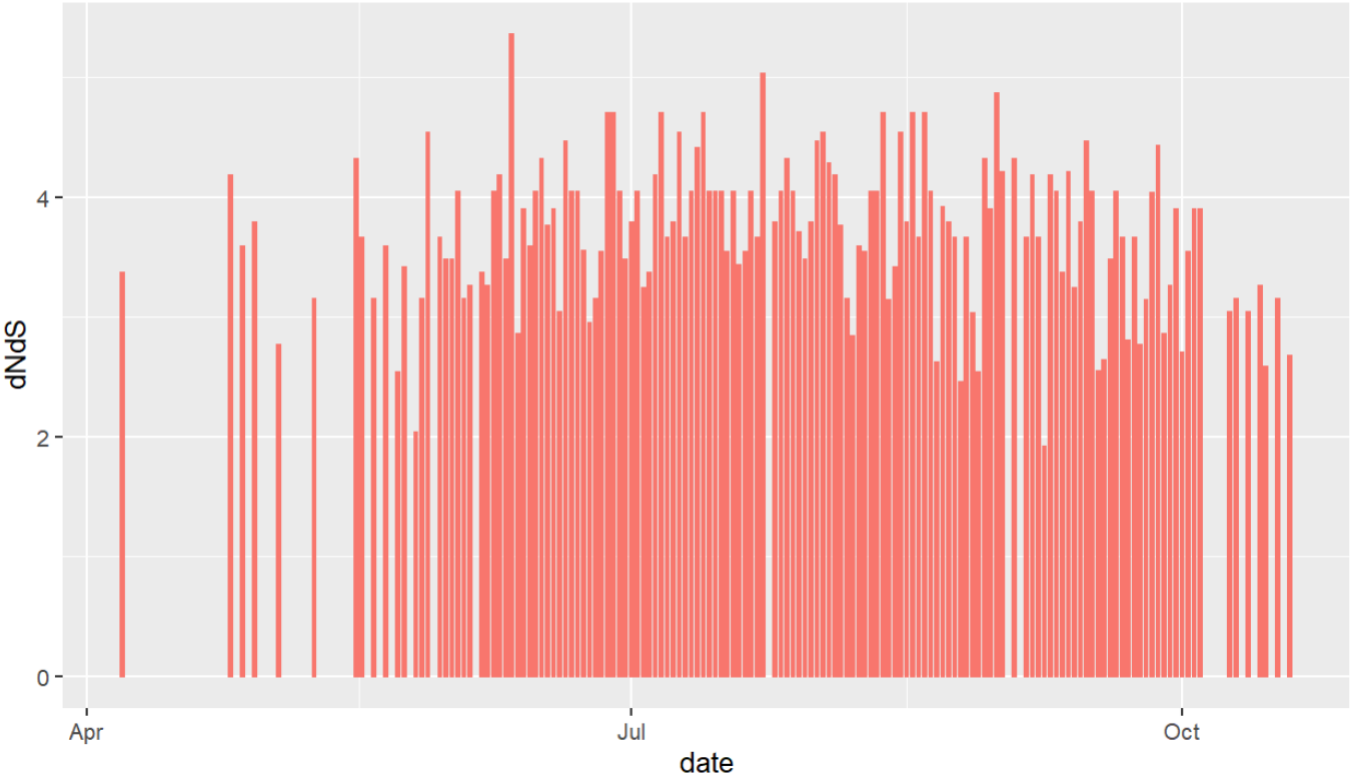## 5. dNdS by date

$dNdS=\frac{NumN - NumN_\beta}{NumS - NumS_\beta}$

dNdS in Delta
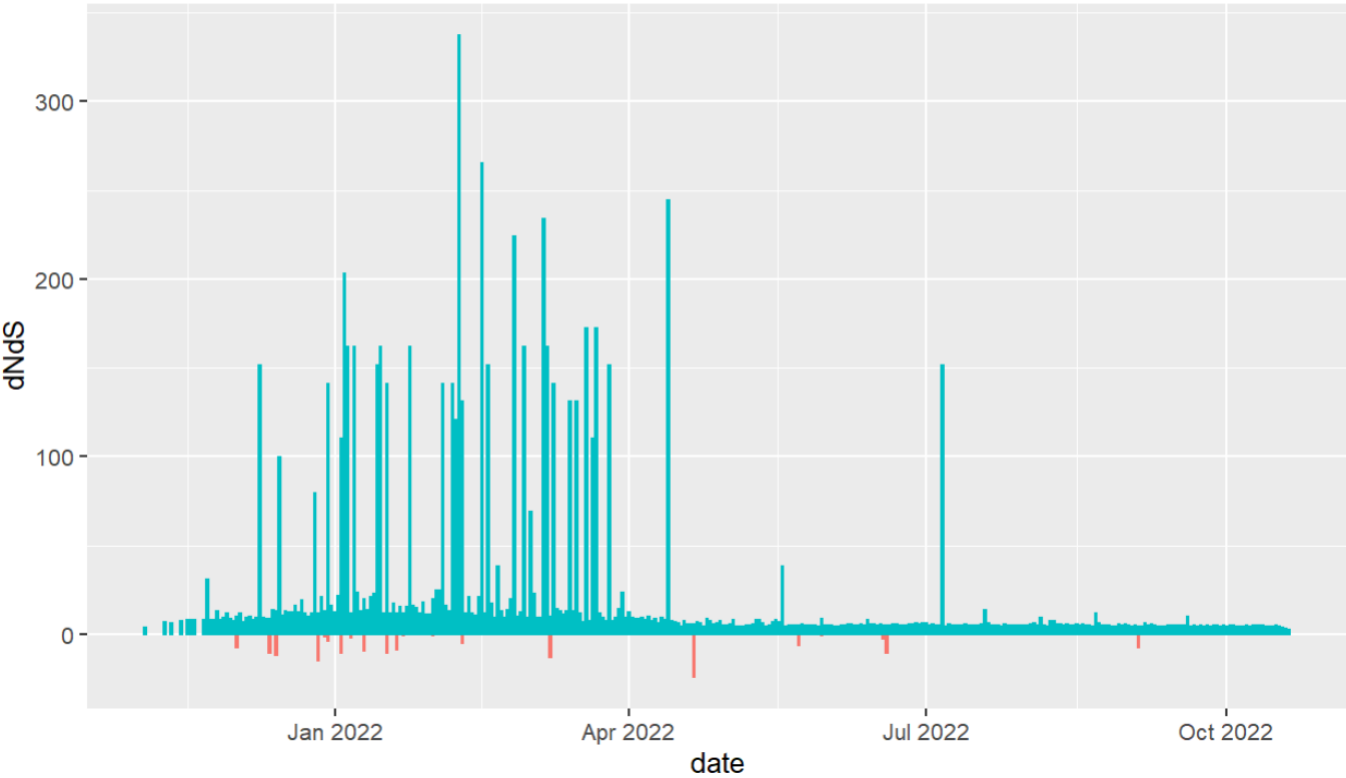
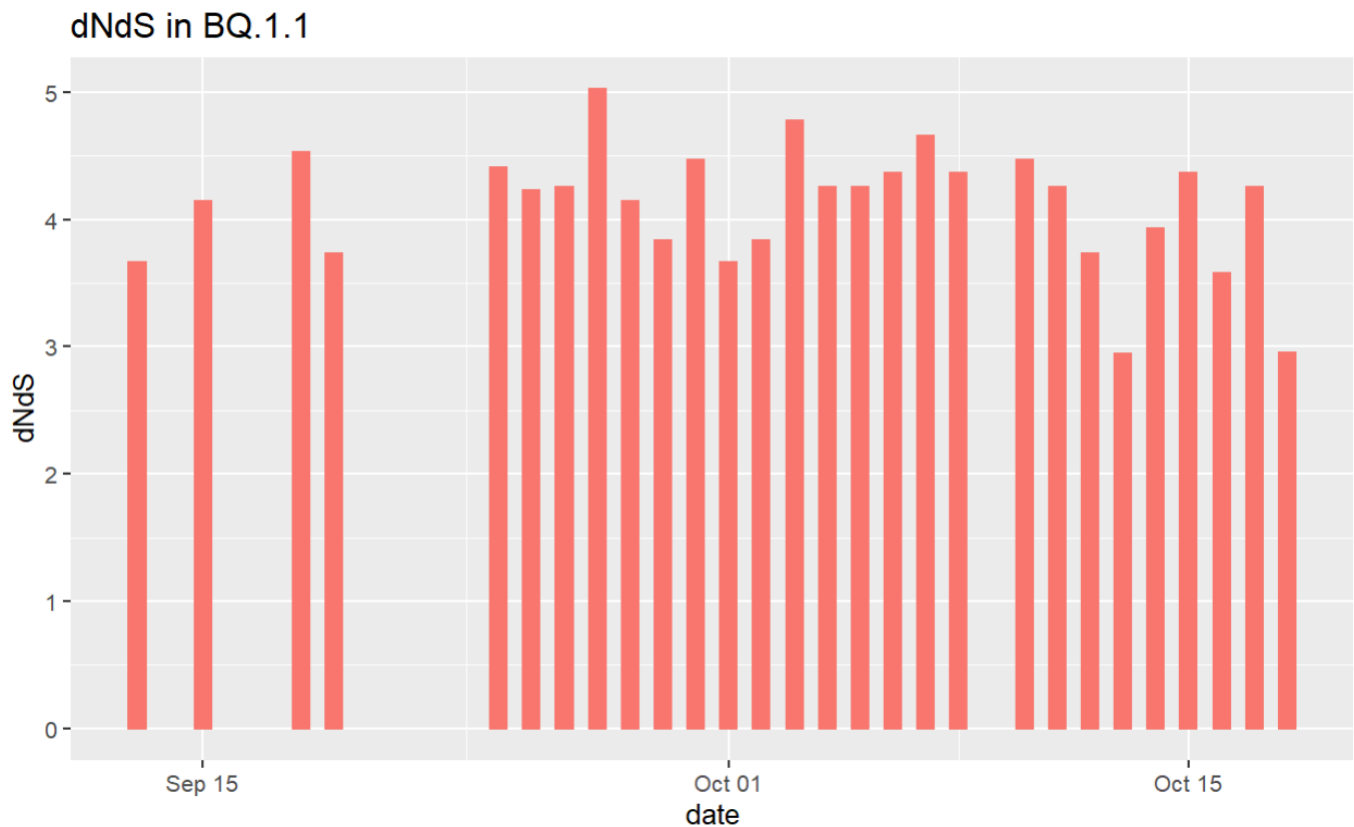## dNdS in Omicron

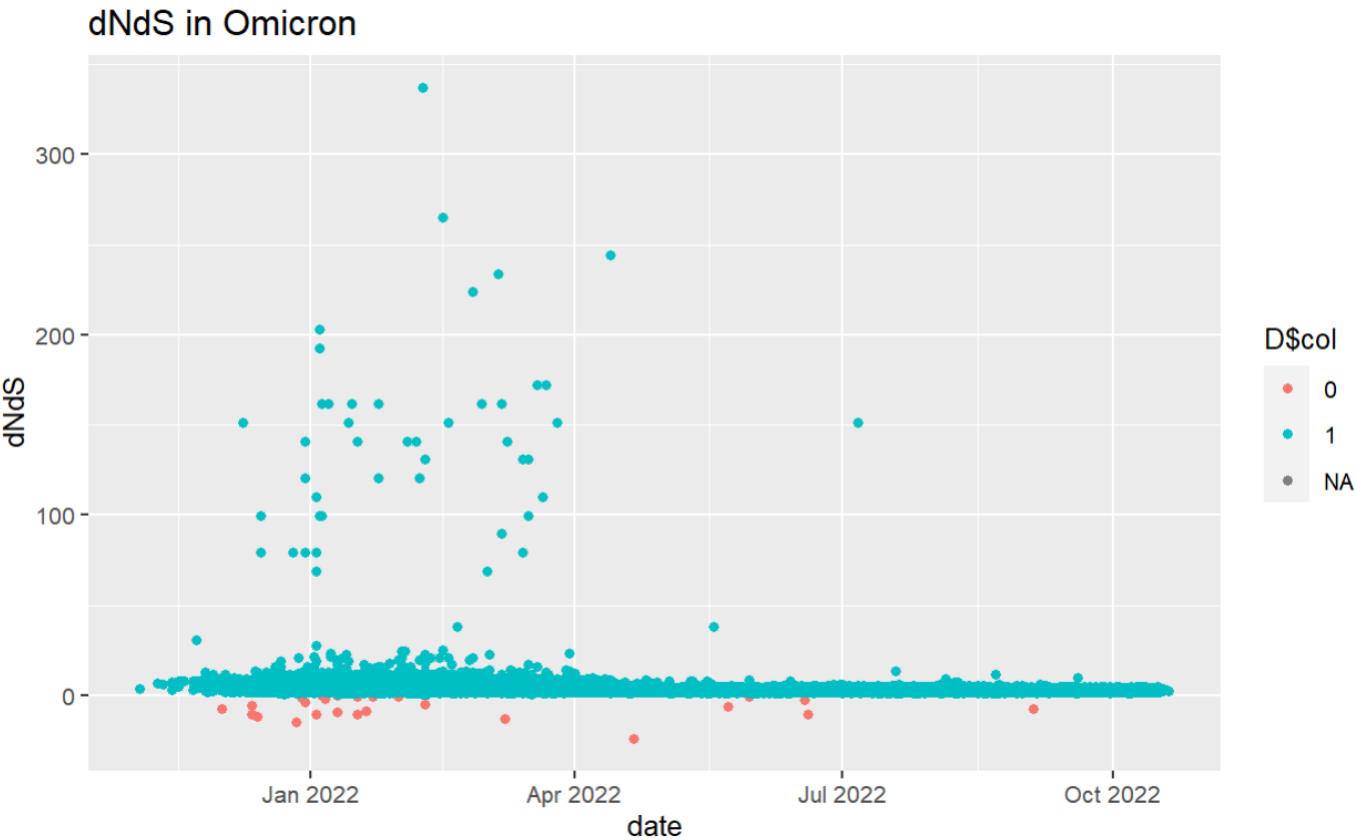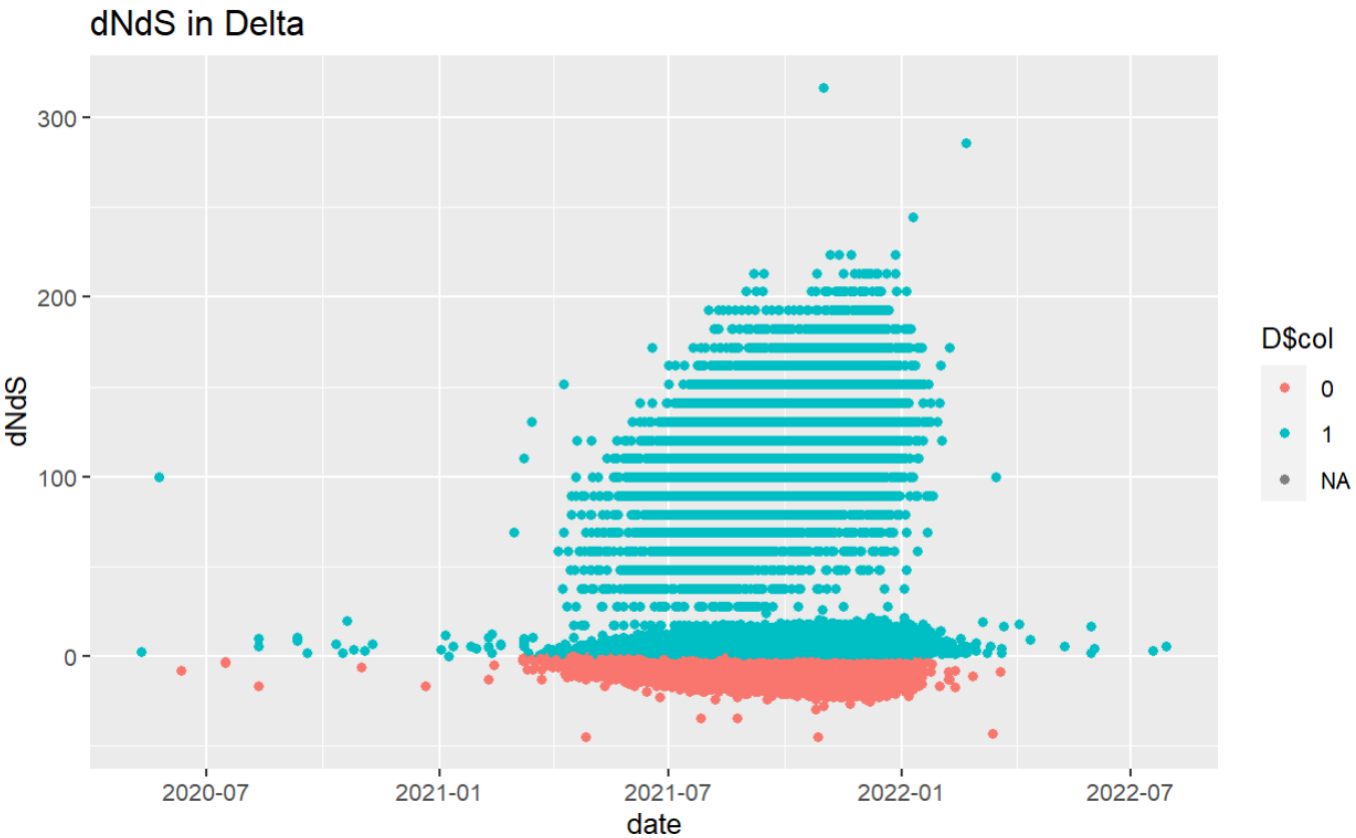## dNdS in BA.2
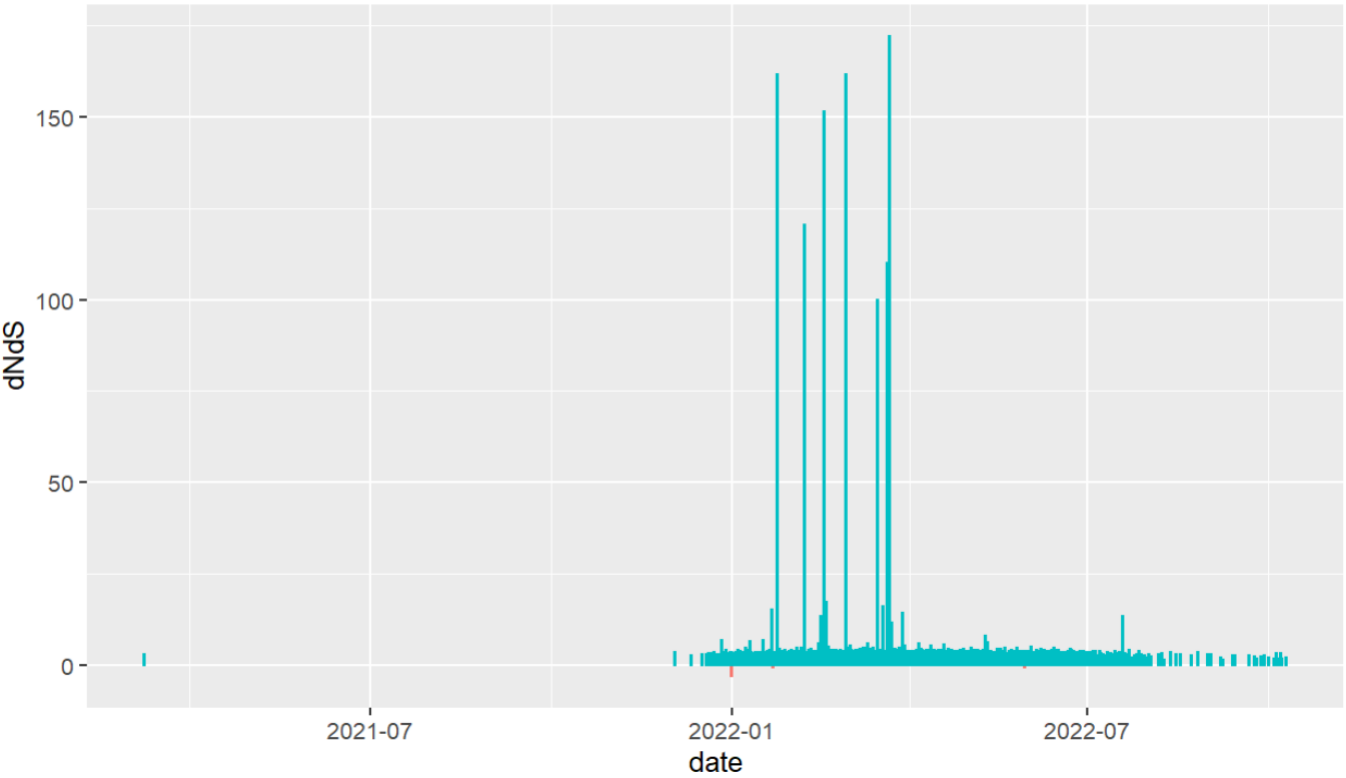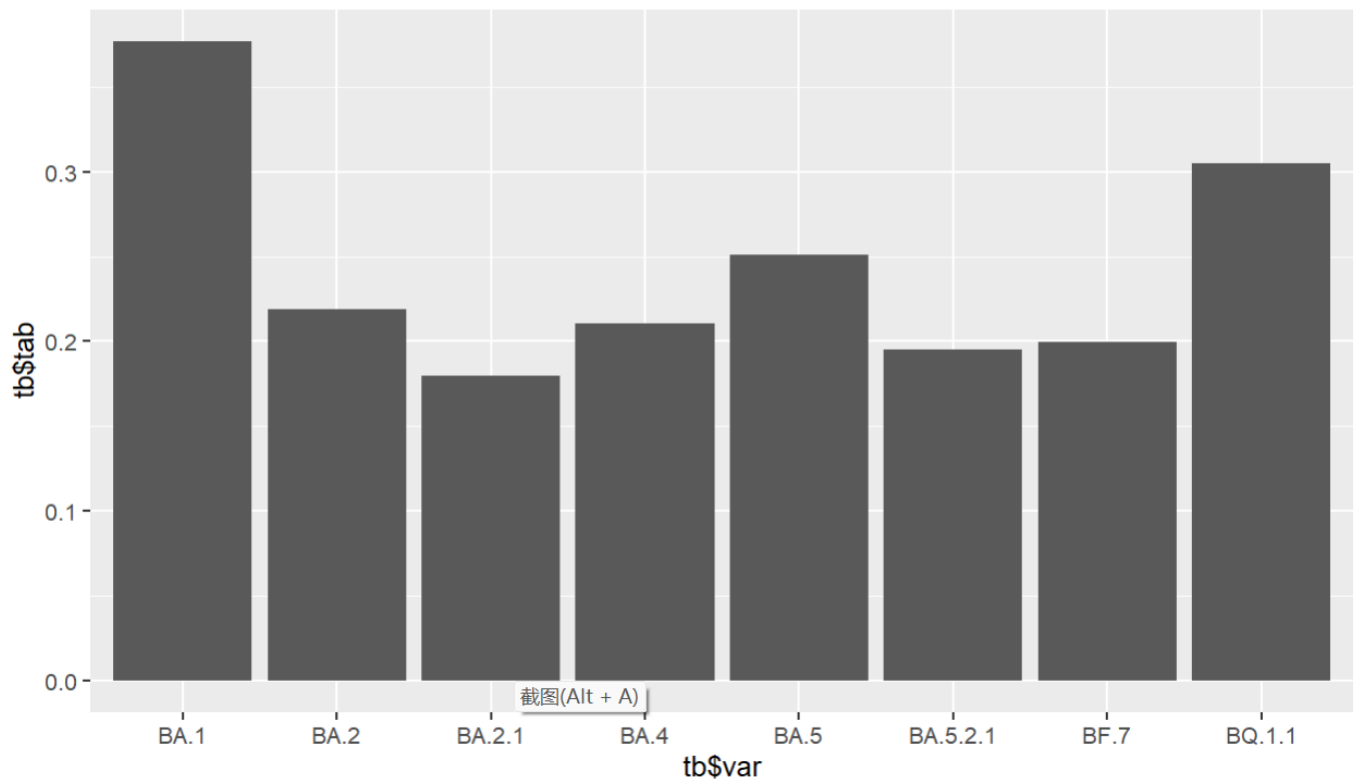
dNdS in BA.5

dNdS in BF.7
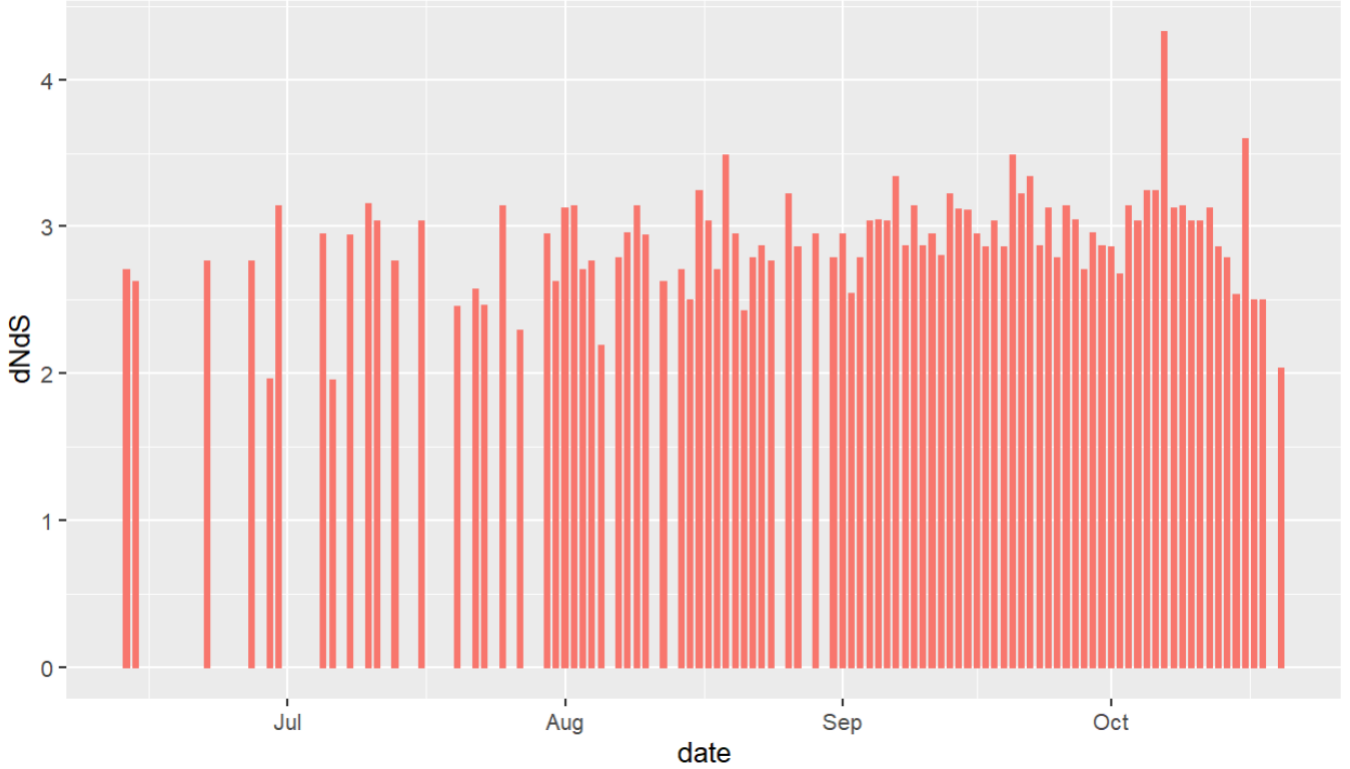
We can infer that dNdS in most proportion of Delta are much higher that those of Omicron, while in Delta there are also more with negative value, meaning dnds_delta smaller than dnds_beta. **While a strong stratification can be seen in point plot of Delta**

dNdS in Delta

dNdS in Omicron

rdNdS comparing to Delta

$rdNdS=\frac{dNdS\_L}{dNdS\_\delta}$

Next

1. How to improve on dNdS analysis?
   In articles I read, they just used dnds and MK test, with checking p-value(by which test?).
   Other than this, I don't have idea. Can I implement it with neural network or machine learning?

2. Quantify on others?