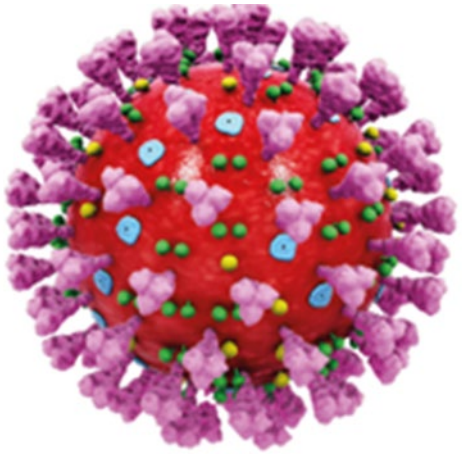
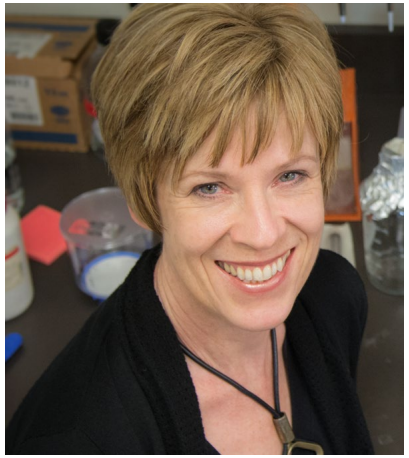
COVID update, Sept 2024

Paula Cannon, PhD
Professor, USC



LA City Health Commission
September 9th, 2024

Disclosures



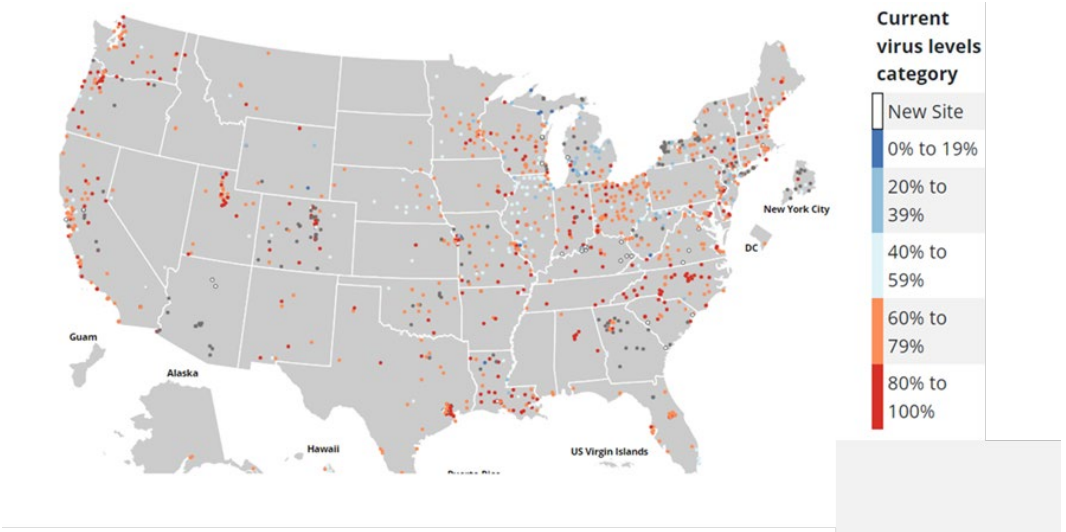
USC University of Southern California

- Distinguished Professor of Molecular Microbiology & Immunology, Keck School of Medicine of USC
- I study viruses, including HIV and SARS-CoV-2, and my work is funded by the National Institutes of Health.
- I serve on Scientific Advisory Boards for Chroma Medicine and Bebio Therapeutics, and the Board of Directors for Blue Whale Bio. I provide expert opinions to biotech companies and lawyers. None of these activities are related to SARS-CoV-2 or COVID, or any of the topics I will cover in this presentation.

COVID rates and waves

Data about COVID (and other viruses) comes mostly from wastewater/sewage sampling

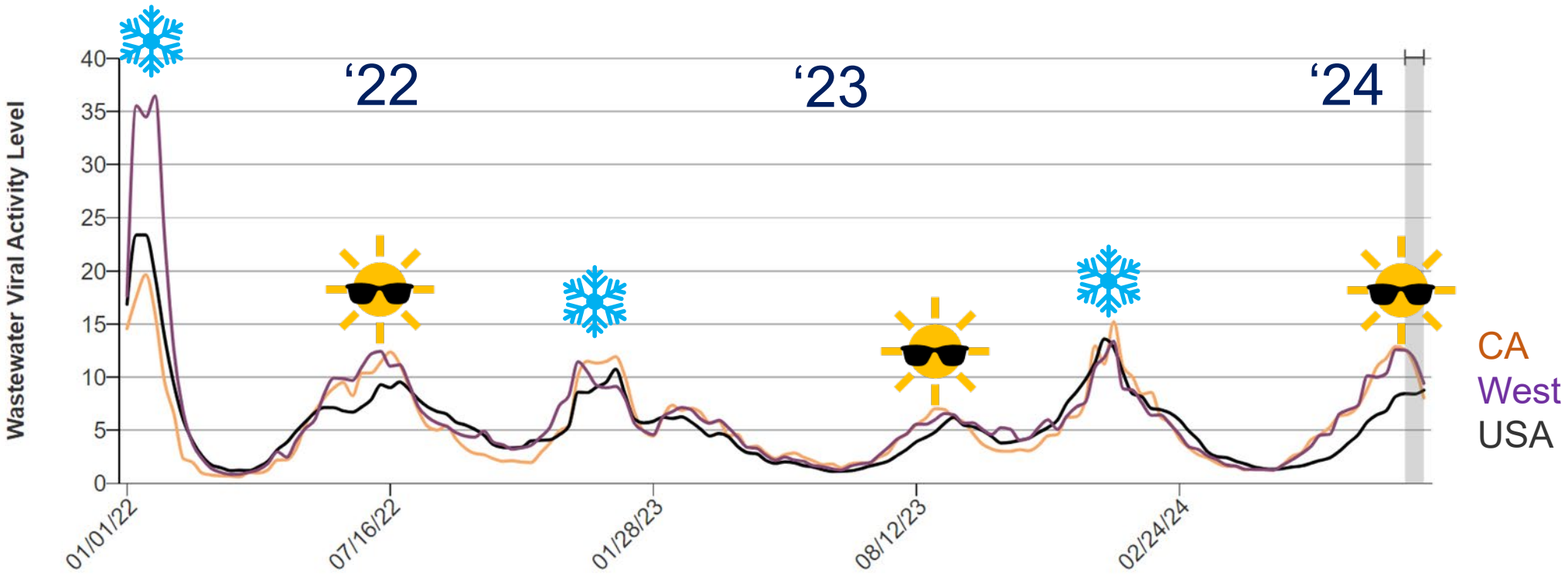
- People with COVID shed virus in feces, can be detected in wastewater/sewage.
- Samples from “sewersheds” (area served by a wastewater collection system) is collected and tested by environmental or public health labs
- CDC analyzes data, posts on its COVID Data Tracker.
- Useful as detects COVID in people with and without symptoms, and can give early indications of an uptick/wave.



Current levels in wastewater by collection site

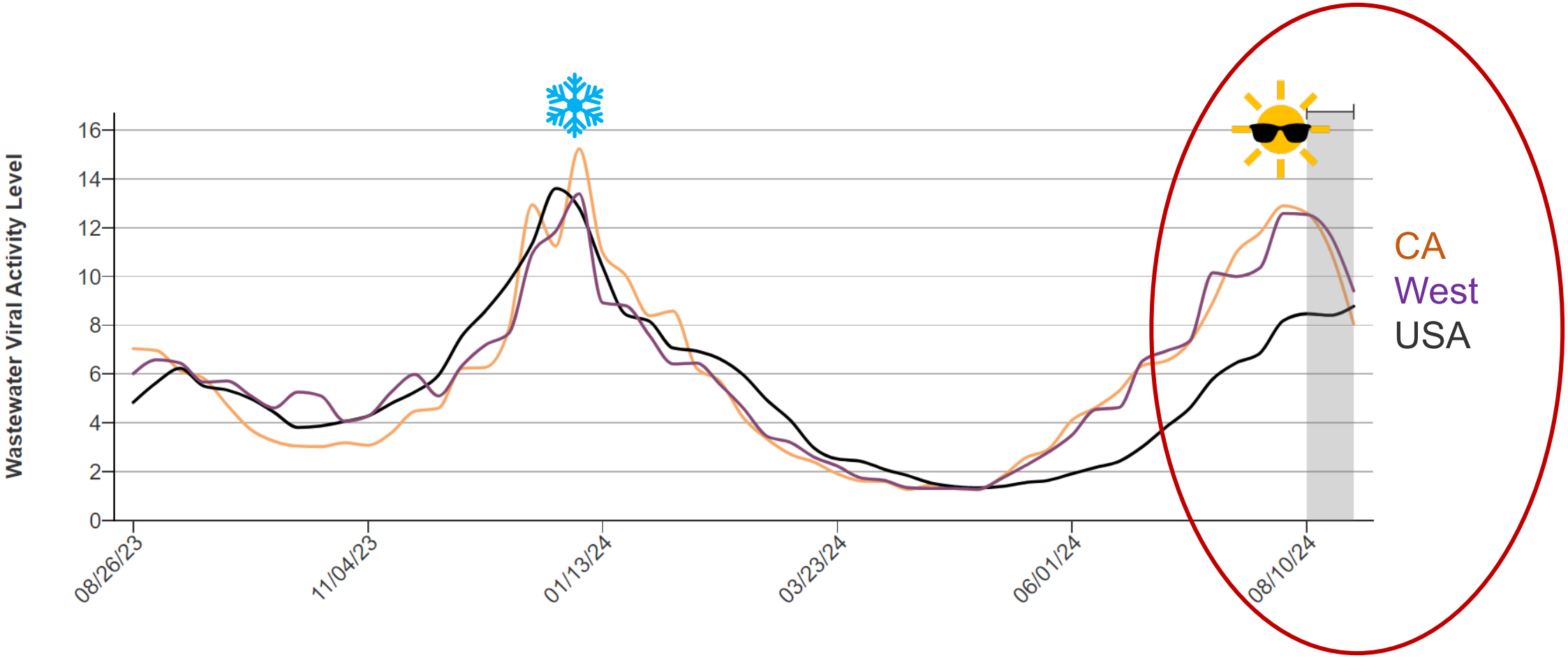
NWSS is National Wastewater Surveillance System
https://www.cdc.gov/nwss/

COVID infections give both Summer and Winter waves



National Wastewater Surveillance System (NWSS)
https://www.cdc.gov/nwss/

California 2024 - big summer wave, but looks like we peaked



National Wastewater Surveillance System (NWSS)
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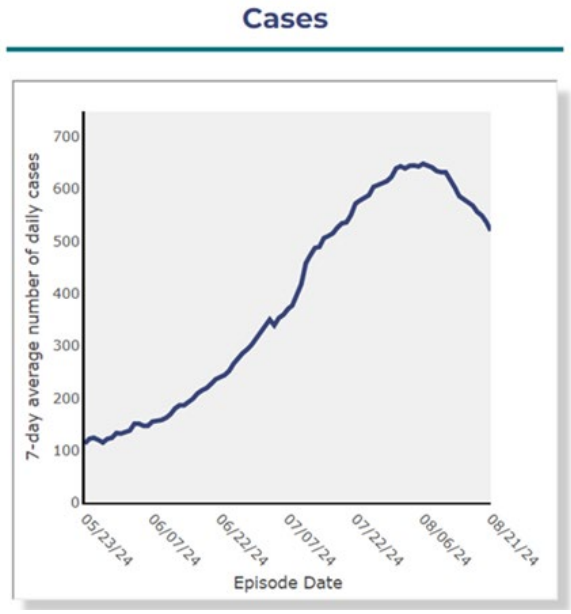
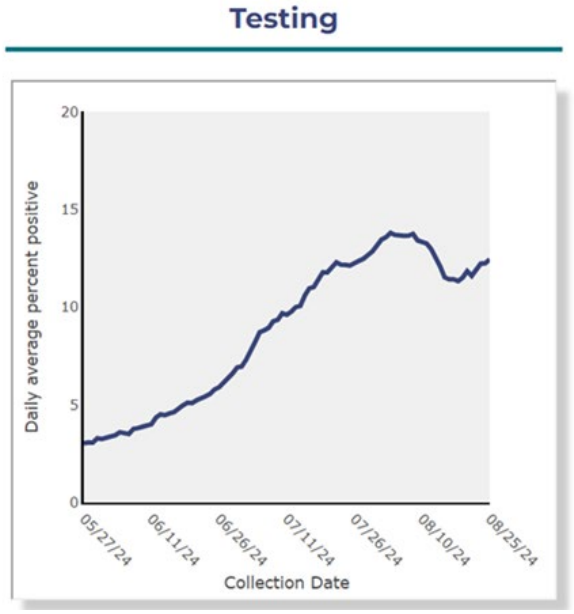
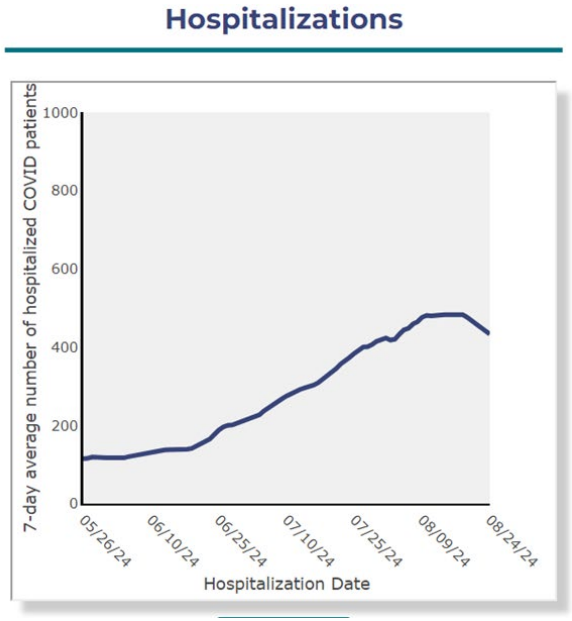
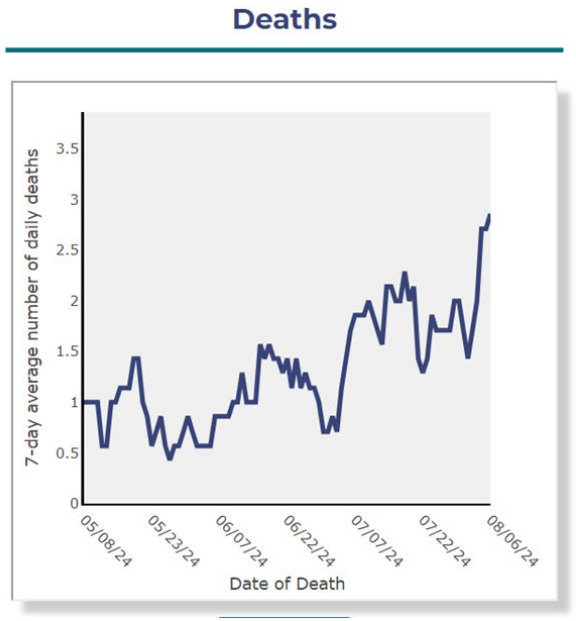
Los Angeles County – other data matches the wastewater data

5/23/24 – 8/21/24









Los Angeles County Department of Public Health
http://publichealth.lacounty.gov/media/Coronavirus/data/index.htm

What drives a Summer wave?

- **Behavior:** weather (indoors in AC with closed windows), vacation and travel, back-to-school, not taking precautions (masks)
- **Waning immunity:** > 6 months since Fall vaccine or Winter infection

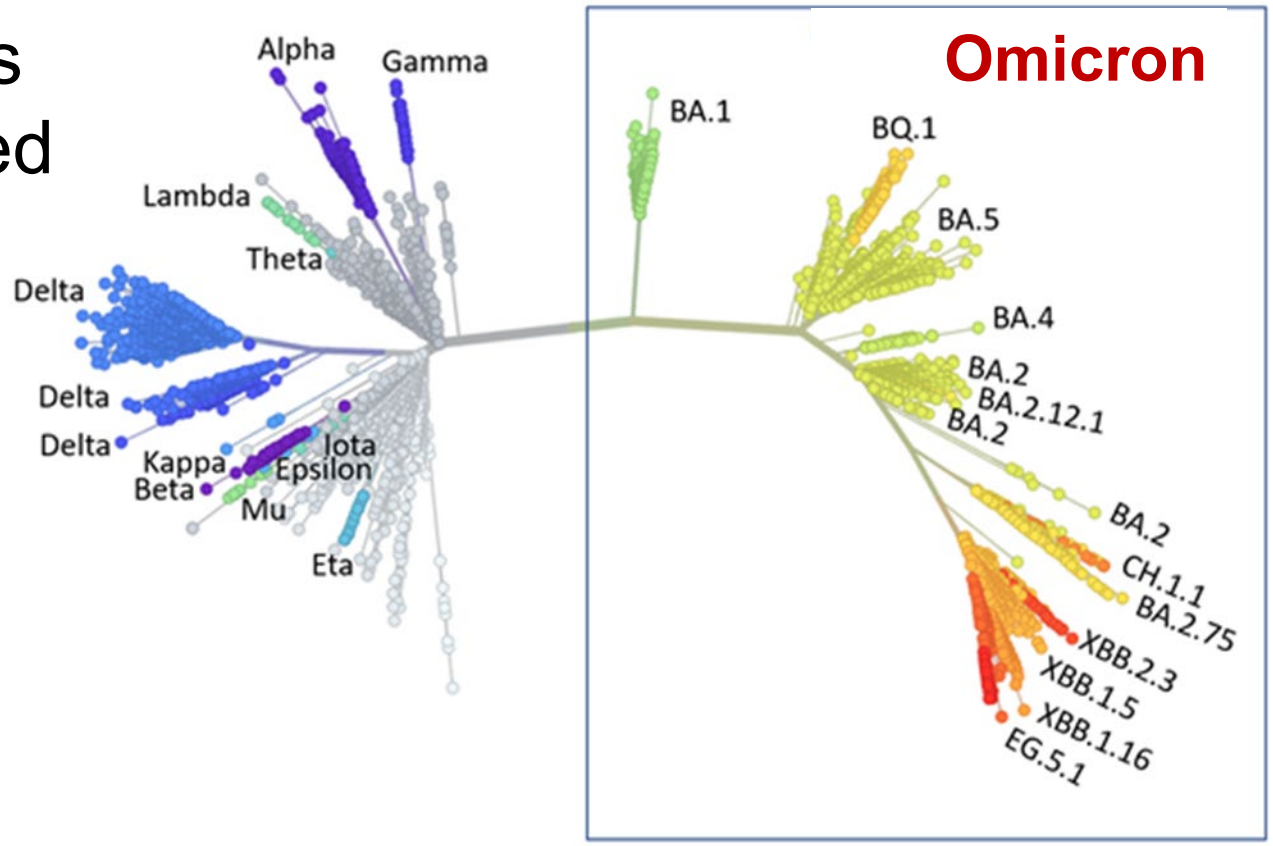
And the virus…..

- High overall levels of COVID all year (> than flu or RSV) make it easier for the virus to mutate and create new variants
- If any new variants are more infectious, or can override our existing immunity, they have an advantage and can create a new wave

What is the virus doing?

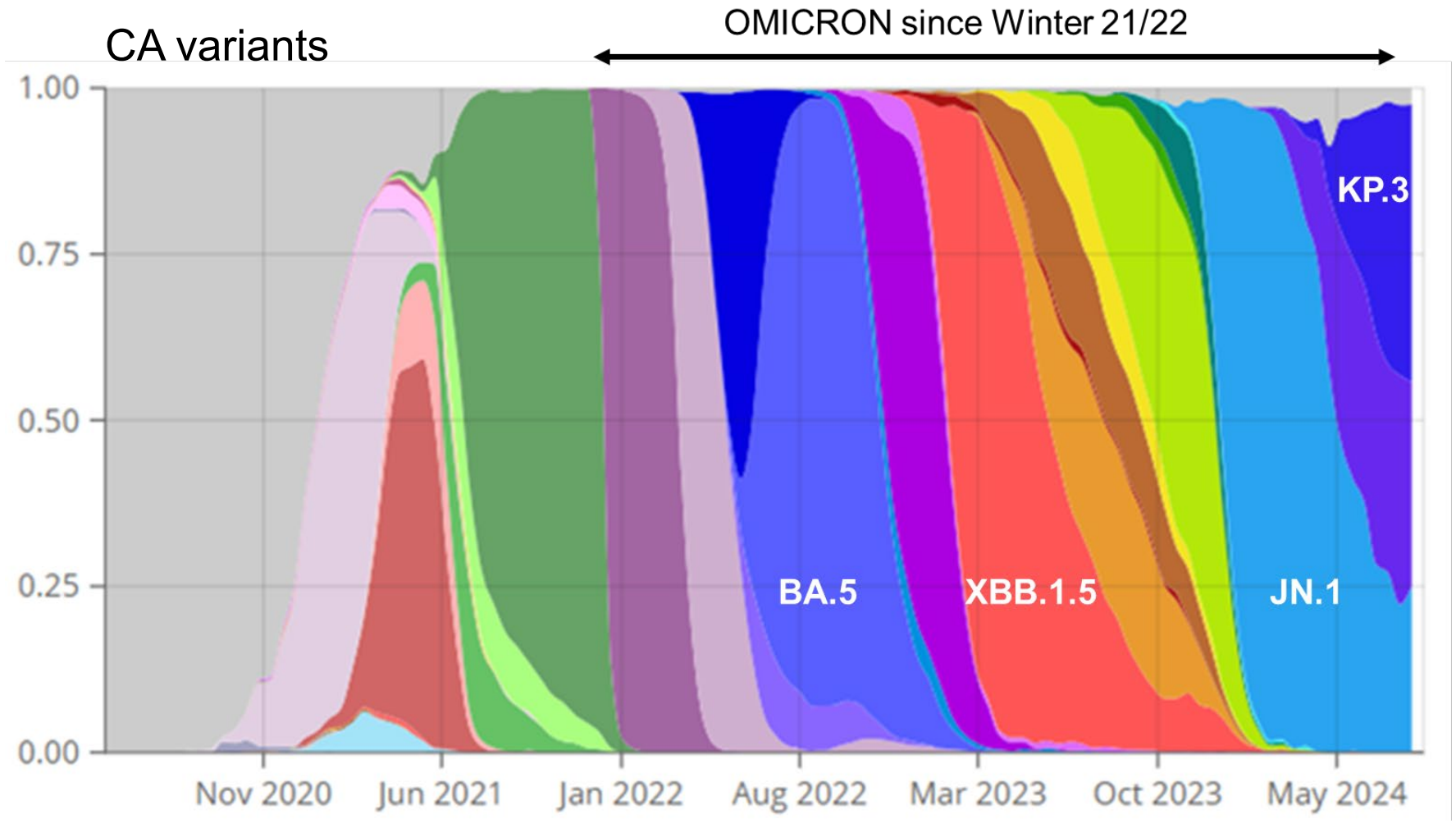
2020-21,
new lineages
rapidly evolved

Since Winter 2021/22,
all Omicron



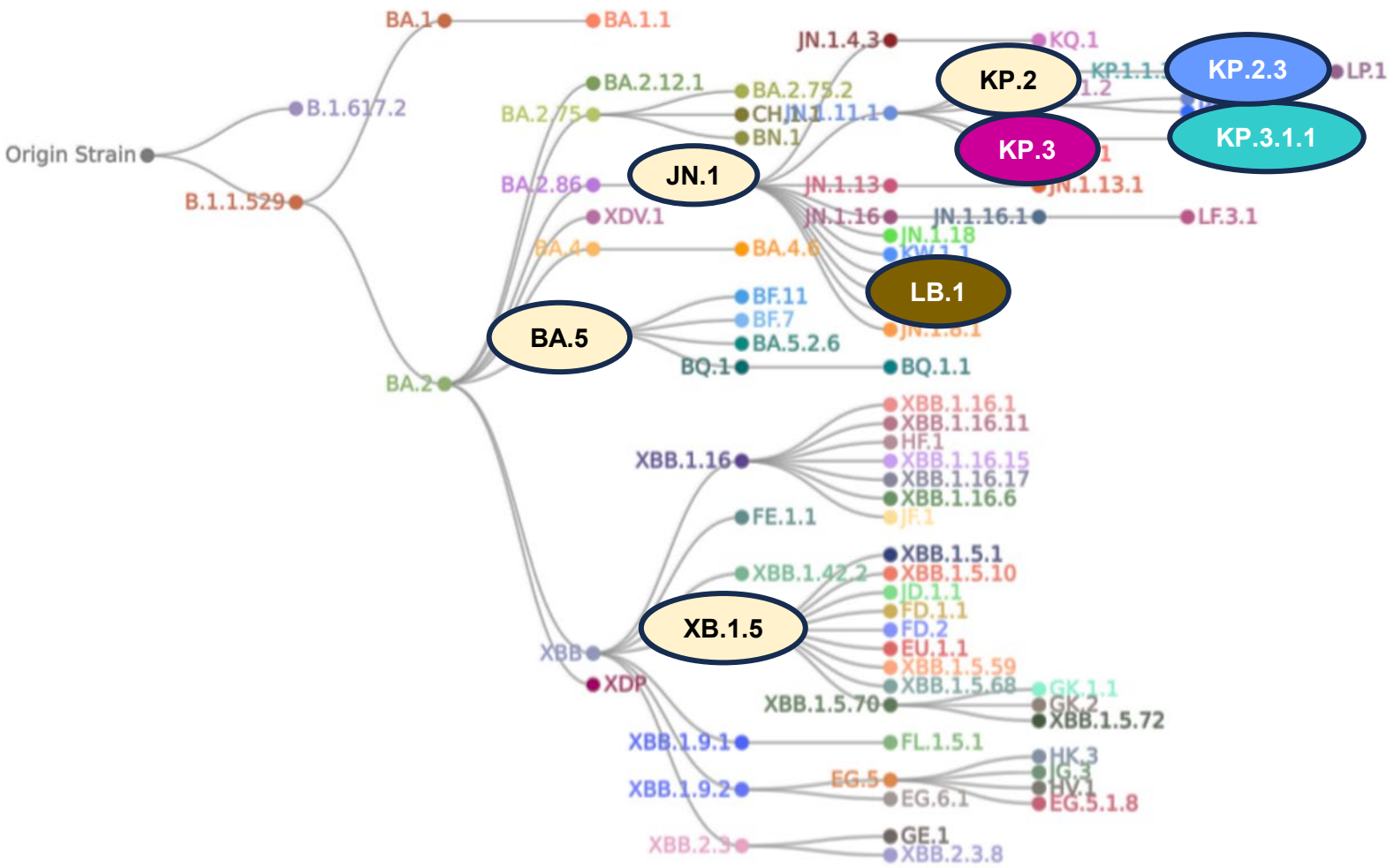
Source: Nextstrain.org

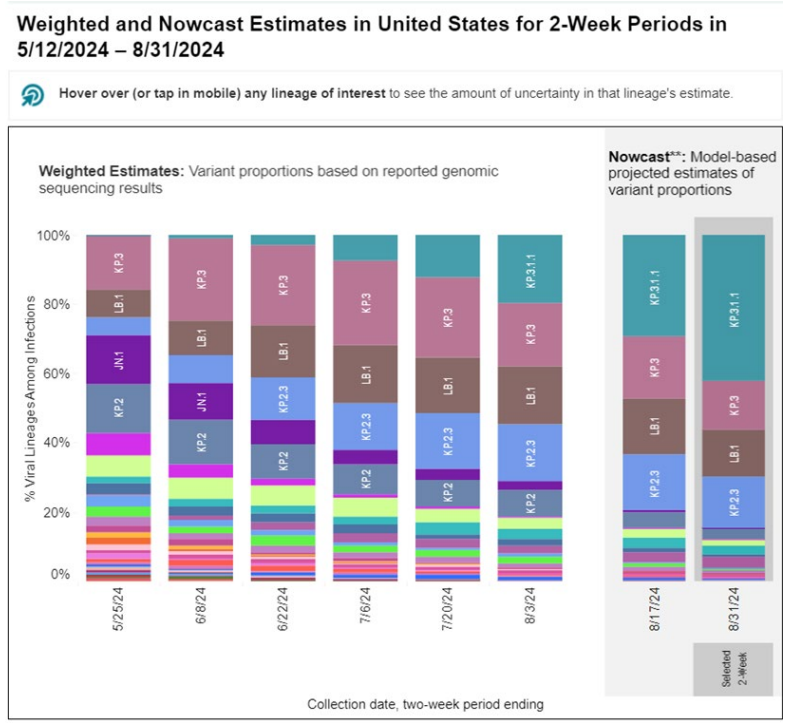
Omicron keeps mutating, and new sub-variants drive waves



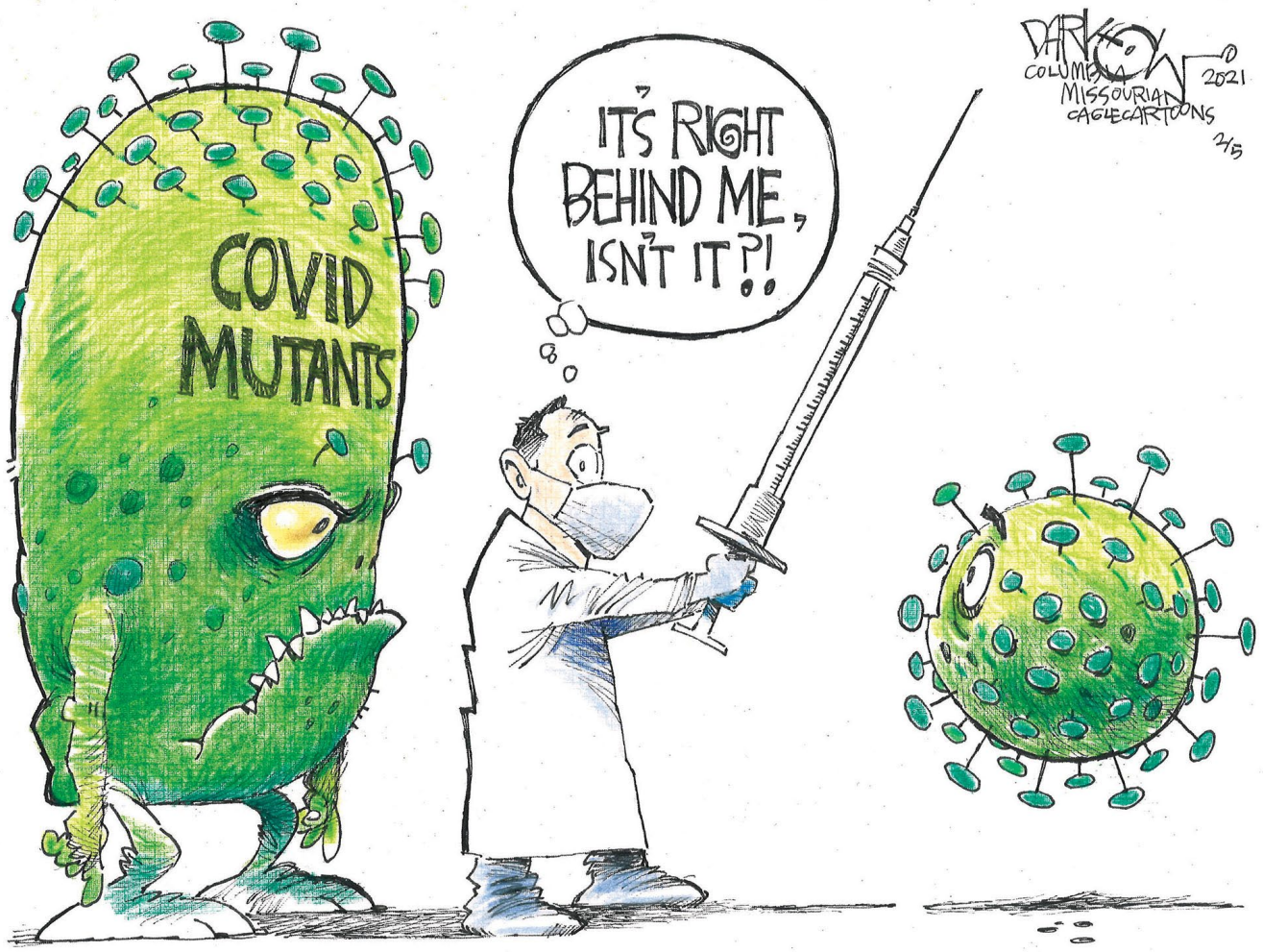
https://covariants.org/

Omicron keeps mutating, and new sub-variants drive waves

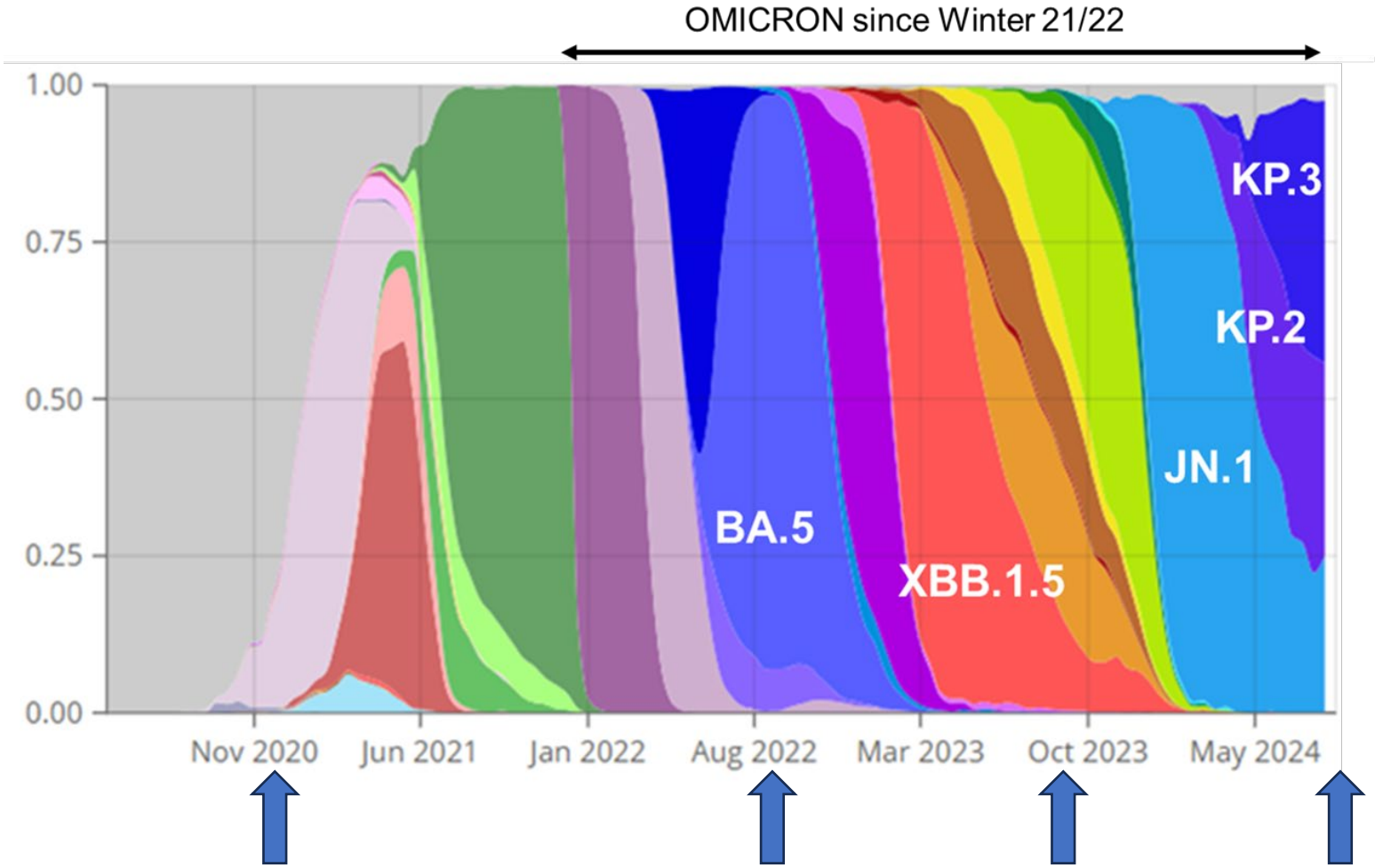




Do vaccines keep up?



CA variants vs. vaccines



Last booster (XBB1.5) vs flu
(by May 2024)

22.5% of adults vs 48.5%
29% >65 yrs old vs 50.6%

Winter '20-'21
Initial vaccine
(Wuhan variant)

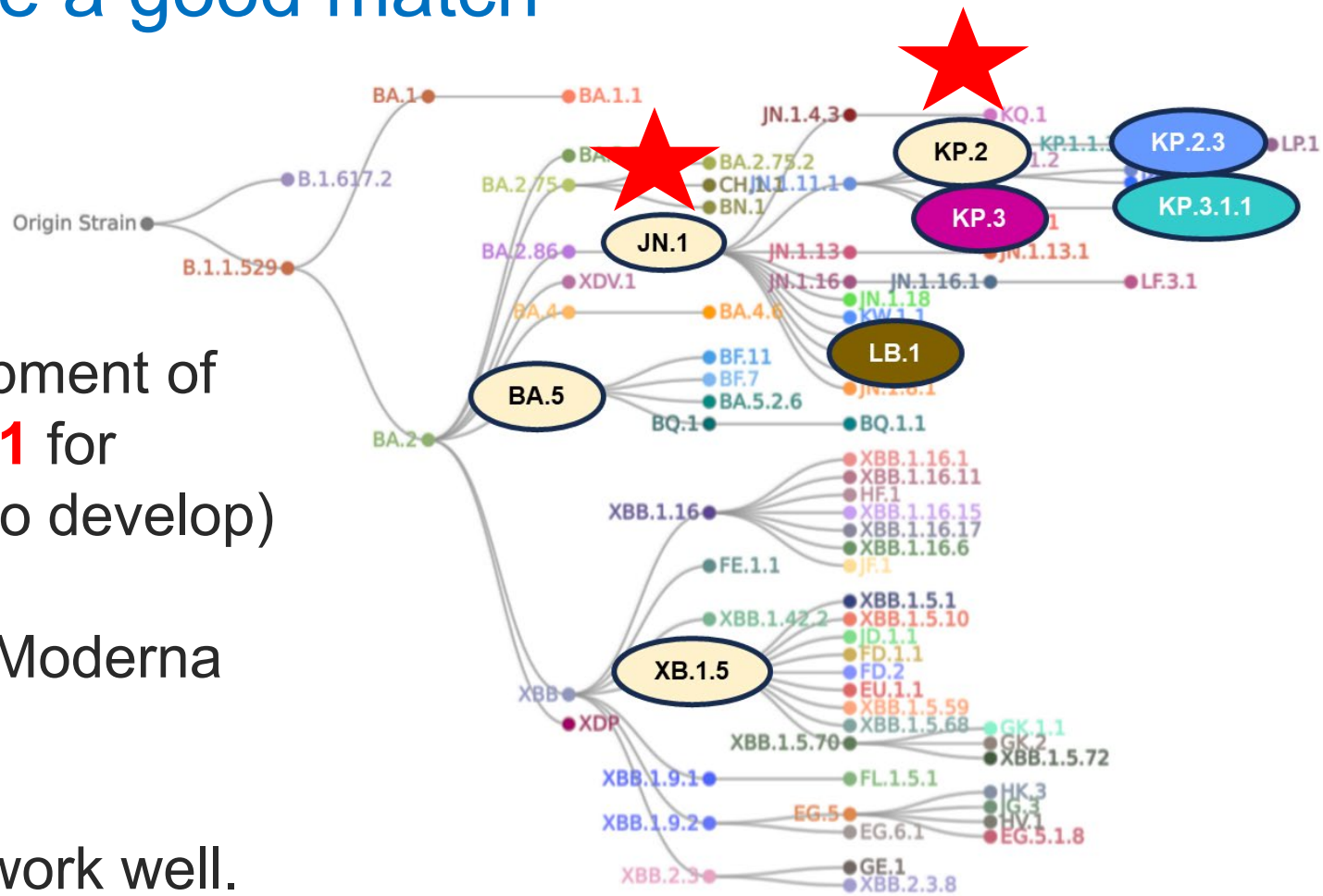
Fall '22
Bivalent vaccine
(Wuhan + BA.5)

Fall '23
XBB1.5*

Fall '24
KP.2 (mRNA)
JN1 (Novovax)

The 2024 Fall vaccines are a good match

- June - FDA advised the development of **KP.2** for RNA vaccines and **JN.1** for protein/Novovax (takes longer to develop)
- Aug: Approved RNA vaccines (Moderna and Pfizer) and Novovax
- All still quite similar, so should work well.



What if I get COVID now?

- Any symptoms - strongly suspect Covid (at the moment), take test, >1 if negative
- Isolate to prevent spreading to others, particularly those in high-risk groups
- Resume normal activity if symptoms improved for 24 hours and no fever, but continue to take precautions, like masking, for 5 days
- Paxlovid: if 65 and older, or anyone >12 with a condition that is a risk factor for severe COVID (eg diabetes, asthma, heart disease, obesity, pregnancy = 75% of Americans)
- Must be started within five days of developing symptoms.
- Reduces hospitalization by 26%, death by 73%, and risk of Long Covid

Final thoughts

- Wastewater monitoring is a good predictor of waves of infection and new variants.
- Expect both Summer and Winter peaks, but hard to predict.
- Circulating variants are a good match for the new Fall vaccines
- Protection against INFECTION wanes quickly, but our immune system makes a much broader response that continues to protect against severe disease
- **How do you time a vaccine?**
  - Wait at least 3 months after infection or last vaccine
  - Consider timing for travel plans (2 – 4 weeks beforehand for peak protection)
  - At risk individuals can get vaccinated twice a year