*August 26, 2022*

## KEY TAKEAWAYS

- New, Omicron-specific, bivalent boosters may be available as early as the first weeks of September. If uptake is strong, these could have a substantial impact on hospitalization rates throughout the fall and winter seasons.
- While case levels remain high, cases have begun to decline statewide. 28 of Virginia's 35 health districts are in declining trajectories, while only 4 are in growth trajectories. Alternative indicators (wastewater, urgent care visits) also suggest cases have plateaued or are declining.
- The BA.5 subvariant remains dominant, while BA.4 subvariants continue to represent about 10% of cases in HHS Region 3. At the moment, there do not appear to be any significant variants on the horizon.

**29.3 per 100k**
*Average Daily Cases Week Ending August 22, 2022*

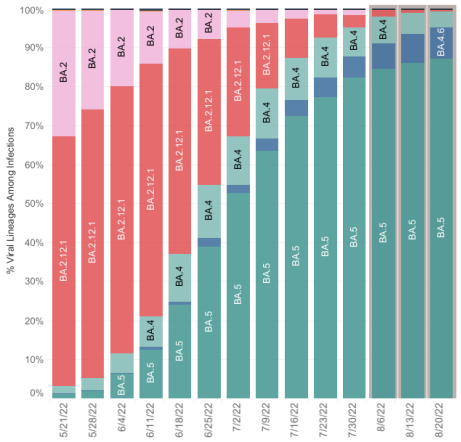
**0.953**
*Statewide Reproduction Number as of August 22, 2022*

**71**
*Virginia Localities at **High** CDC Community Levels as of August 25, 2022*

**38**
*Virginia Localities at **Medium** CDC Community Levels as of August 25, 2022*

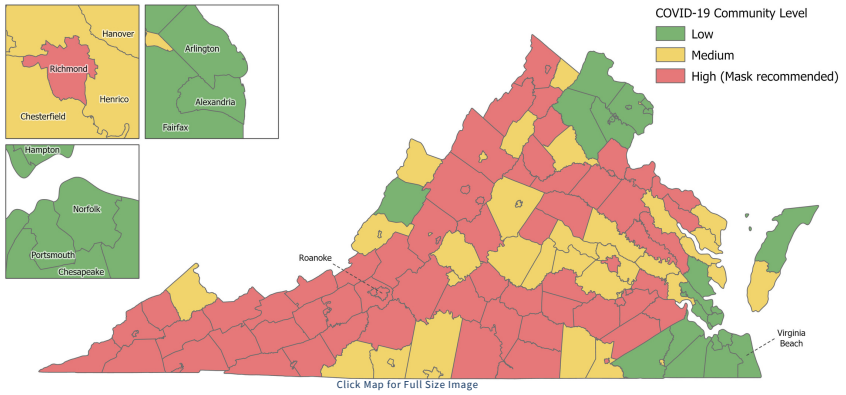
## KEY FIGURES

### Variant Mix – HHS Region 3



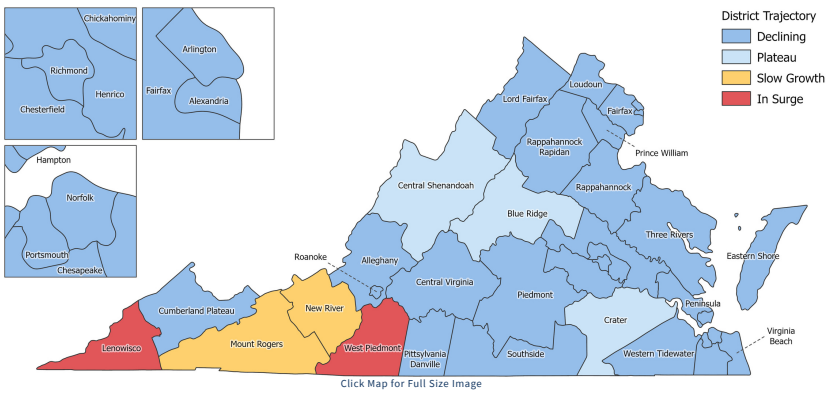

### CDC Community Levels

As of August 25, 2022




### Growth Trajectories: Two Health Districts in Surge

| Status | # Districts (prev week) |
|---|---|
| Declining | 28 (22) |
| Plateau | 3 (3) |
| Slow Growth | 2 (7) |
| In Surge | 2 (3) |



UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

# UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

## THE MODEL

The UVA COVID-19 Model and weekly results are provided by the UVA Biocomplexity Institute, which has over 20 years of experience crafting and analyzing infectious disease models. It is a health district-level **S**usceptible, **E**xposed, **I**nfected, **R**ecovered (SEIR) model designed to evaluate policy options and provide projections of future cases based on the current course of the pandemic. The Institute is also able to model alternative scenarios to estimate the impact of changing health behaviors and state policy.

***COVID-19 is a novel virus, and the variant mix changes periodically. These models improve as we learn more.***

## THE SCENARIOS

Unchanged: The model uses scenarios to explore the potential paths the pandemic may take under future conditions. Model projections take a variety of factors into account, including current variants, vaccine uptake, vaccination/boosting rates, previous infection, waning immunity, weather, and behavioral responses. The "**Adaptive**" scenario represents the current course of the pandemic, projecting it forward with no major changes. The "**VariantX**" modifier explores the potential impact of a new variant emerging in the next three months. This hypothetical variant is imagined as having the same immune escape and transmissibility advantages over BA.4/5 that BA.4/5 did over the earlier BA.2. See page three of the July 15 report for details. The "**FallWinter**" modifier layers seasonal increases associated with colder weather, indoor gatherings, and holiday travel on top of the base scenarios. It does this by artificially adjusting transmissibility between September and January to match transmissibility from the same time last year. The new "**EarlyBooster**" and "**LateBooster**" modifiers explore the impact of a vaccine booster campaign starting in mid-September or mid-November respectively. It assumes that these will be Omicron-specific vaccines, and that they will be 80% effective against symptomatic disease.

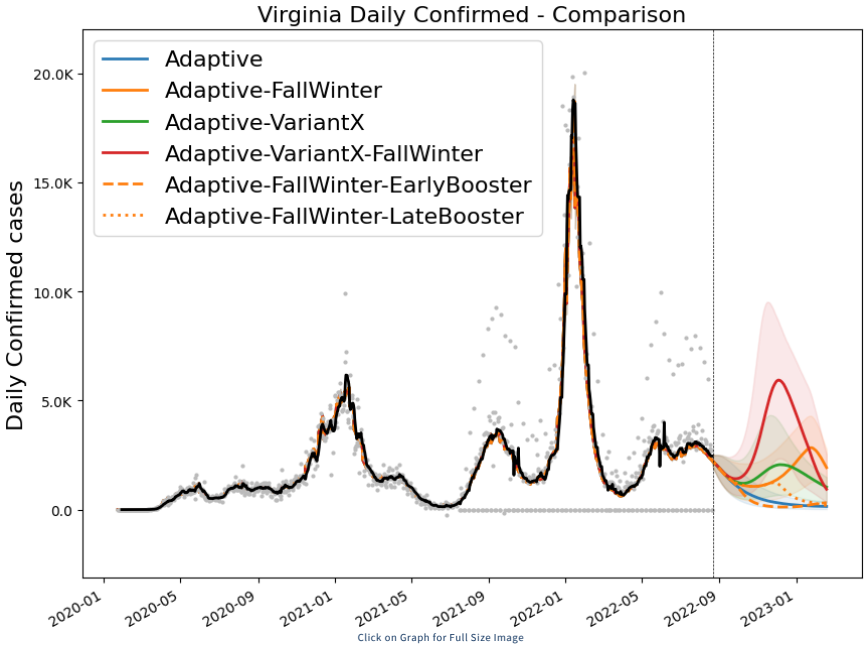
## MODEL RESULTS

**Updated:** As always, the current course "**Adaptive**" scenario is shown in blue. This scenario projects a continued slow decline of cases. In this scenario, Virginia will fall below 1,000 daily cases by October 9th.

Both the "**Adaptive-FallWinter**" (orange) and "**Adaptive-VariantX**" (shown in green) scenarios project mild surges, peaking at around 2,500 daily cases in January, and 2,000 daily cases in December, respectively.

The "**Adaptive-VariantX-FallWinter**" (red) combines both a hypothetical new variant with the seasonal forcing of Fall / Winter. The combination allows for a significant surge, peaking at almost 6,000 daily cases in early-December before quickly declining.

The "**Adaptive-FallWinter-EarlyBooster**" and "**Adaptive-FallWinter-LateBooster**" scenarios (dashed orange lines) show that even in the case of a Fall / Winter surge, a booster campaign can quickly tamp down cases. Models suggest such campaigns could reduce hospitalizations by 50%.




*Date of Latest Model Run: August 24, 2022*
*Date of Next Model Run: September 7, 2022*

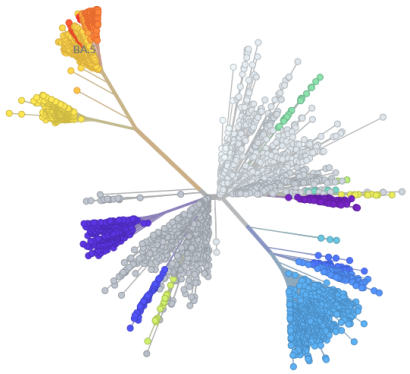
**Please note:** The data and projections shown here reflect reported cases. During the Omicron wave, testing shortages resulted in far fewer infections being reported as cases. This suggests fewer total infections than experienced in January. Please see page three of the May 13th modeling report for more details.

# ANOTHER ROUND OF BOOSTERS

As of today, over 6 million Virginians are fully vaccinated, and almost 3.7 million have received at least one booster dose. Regardless of which of these categories you fall into, it may be time to start planning for another dose. Recently, the CDC began planning to launch an new Omicron-specific, bivalent booster. While there are still several steps to complete before the new vaccine is approved and distributed, some news reports suggest this new booster could be available shortly after Labor Day.

As with other COVID-19 vaccine roll-outs, not everyone will be eligible right away. Currently, a bivalent booster is expected to be available for those 12 and older. Those who have not completed a full primary vaccination series (1 dose of Johnson & Johnson vaccine, or 2 doses of Pfizer or Moderna vaccine) will need to do so before receiving the new booster.

## What makes the new boosters different?



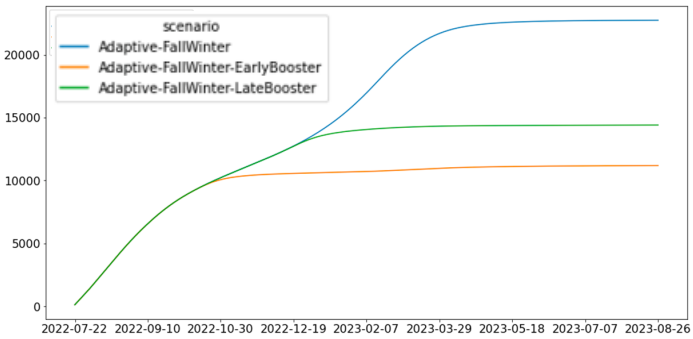
*The Omicron variants and subvariants (yellow and orange, upper left) are genomically very different than previous variants.* Source: Nextstrain

As mentioned above, the new boosters are bivalent boosters which target both the original covid-19 vaccine strain and the new BA.4 and BA.5 Omicron strains. While there are still some BA.2 strains circulating, the CDC estimates that BA.4 and BA.5 account for over 99% of variants circulating in the United States. Globally, BA.4 and BA.5 account for about 80% of submitted sequences. Virtually all submitted sequences are Omicron subvariants.

Additionally, the bivalent vaccine also targets two Omicron strains which are very different than the original, wild-type strain targeted by the primary series vaccines. If you have not completed your primary series, or are eligible for a booster and have not received it, don't wait. Current vaccines still work exceptionally well at protecting against severe illness and death, and receiving doses targeting both wild-type and Omicron strains may better train your immune system to resist a broader array of variants.

## The impact on COVID-19 in Virginia

The team at the UVA Biocomplexity Institute have already developed scenarios examining the impact of the new boosters of the course of COVID-19 in Virginia. As we enter the fall and winter seasons, the new boosters could have a substantial impact on COVID-19 cases. Even though protection provided by vaccination and previous infection have already reduced hospitalization rates, a new booster campaign beginning in early September may reduce severe outcomes by 50%, keeping about 11,500 Virginians out of the hospital compared to a scenario without boosters. Even a later booster campaign would have a significant impact, preventing over 8,000 hospitalizations.




*The new boosters could have a substantial affect on hospitalizations, particularly as we enter the fall and winter seasons which have historically had higher COVID-19 transmission rates.*

These results, however, will only occur if vaccination uptake plays out as projected. In the new environment, the UVA team used historic flu vaccine uptake as a benchmark. Fewer COVID-19 boosters will mean fewer COVID-19 hospitalizations avoided. However, if Virginians exceed this benchmark, hospitalizations could be reduced even further. As always, Virginia's health is in our hands. If you have not done so already, get vaccinated, and get boosted when eligible.