UVA COVID-19 MODEL WEEKLY UPDATE

April 29th, 2022

KEY TAKEAWAYS

- Cases have increased from recent lows, nationally and in several regions of Virginia.
- Omicron's BA.2 subvariant is dominant in Virginia and nationally, while the BA.2.12.1 subvariant is beginning to make inroads, particularly in New York and the Northeast.
- Behavior changes and Omicron's subvariants may drive a summer surge. The model suggests case and hospitalization peaks somewhere between levels seen during the Delta and Omicron waves.
- Projected deaths are much lower than previous waves, as Virginia's immunity profile continues to improve due to vaccinations, boosters and previous infections, and as treatments become available.

14.7 per 100k
Average Daily Cases Week Ending April 25th, 2022

(187 per 100k)
*Adaptive Scenario Forecast Average Daily Cases, **Already Peaked** on January 16th, 2022*

933 / 1,098
Average Daily 1st / 2nd Doses April 25th, 2022

1,779 / 6,141
Average 1st / 2nd Boosters April 25th, 2022

(Vaccine estimates are preliminary)

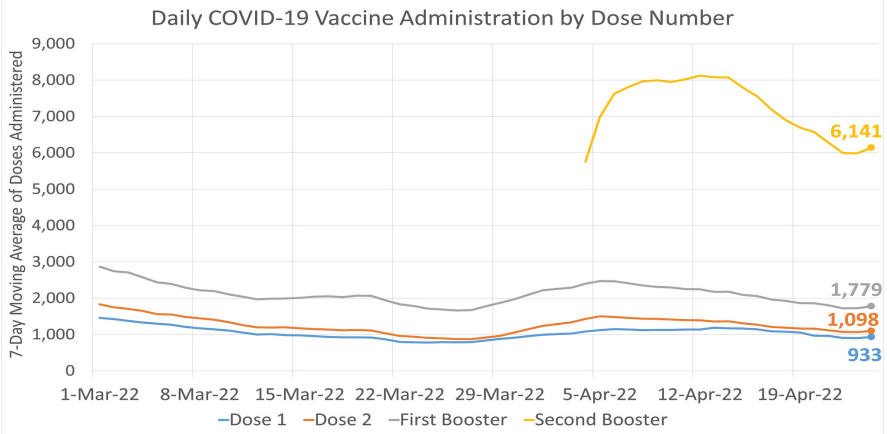
KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

Region	R_e April 25th	Weekly Change
Statewide	**1.044**	**0.113**
Central	0.956	0.040
Eastern	1.058	0.190
Far SW	0.980	-0.094
Near SW	1.144	0.256
Northern	1.022	0.000
Northwest	1.132	0.488

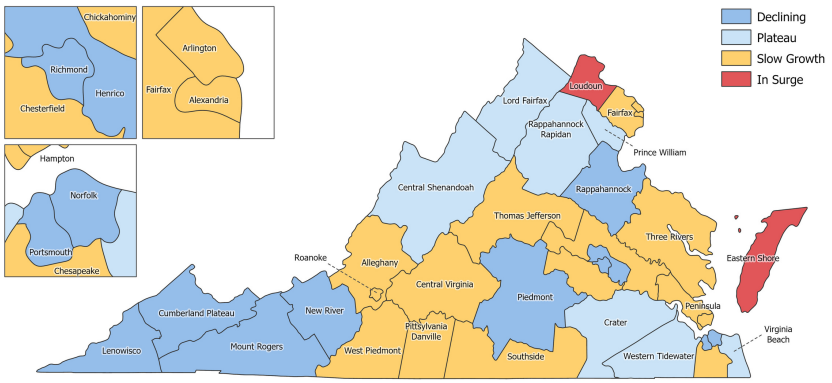
Vaccine Administrations

Note: This week's vaccination estimates are preliminary and subject to change.



Growth Trajectories: Two Health Districts in Surge

Status	# Districts (prev week)
Declining	10 (11)
Plateau	7 (4)
Slow Growth	16 (18)
In Surge	2 (2)



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

Updated: The models use various scenarios to explore the path the pandemic is likely to take under differing conditions. The CDC estimates that the Omicron variant and its subvariants represent >99% of all new cases in Virginia. As such, current scenarios are based on the immune escape and transmission profiles of these variants. As before, models use COVIDcast surveys to estimate county-level vaccine acceptance levels. They then assume that vaccinations increase in each county until they reach this value. Afterwards, we assume that 40% of vaccinated individuals will receive a booster at the same rate.

As always, the "**Adaptive**" scenario represents the current course of the pandemic. It assumes that there will be no major changes in interventions or transmissibility. It also does not track changes in seasonal forcing, variant proportions, or public vigilance. Rather, it is a basic projection of current trends. The "**Adaptive-VariantBA2**" scenario adjusts for the Omicron BA.2 subvariant's enhanced transmissibility. It assumes that BA.2 will reach 95% prevalence by May. It also assumes that BA.2 is 30% more infectious than BA.1. The new "**Adaptive-VariantBA2_12**" scenario adjusts for the BA.2.12.1 subvariant's even greater transmissibility. It assumes BA.2.12.1 becomes dominant by June and reaches 95% prevalence by July. It also assumes that BA.2.12.1 is 30% more infectious than BA.2. The new "**Adaptive-VariantBA2_12-IncreasedControl**" scenario adds increased mitigation strategies and seasonality to the "Adaptive-VariantBA2_12" scenario. These include increased home testing, masking, and self-isolation when sick. This scenario is meant to model the potential public response to a new summer surge. It assumes that these interventions will have a 25% reduction in community transmission and start in June.

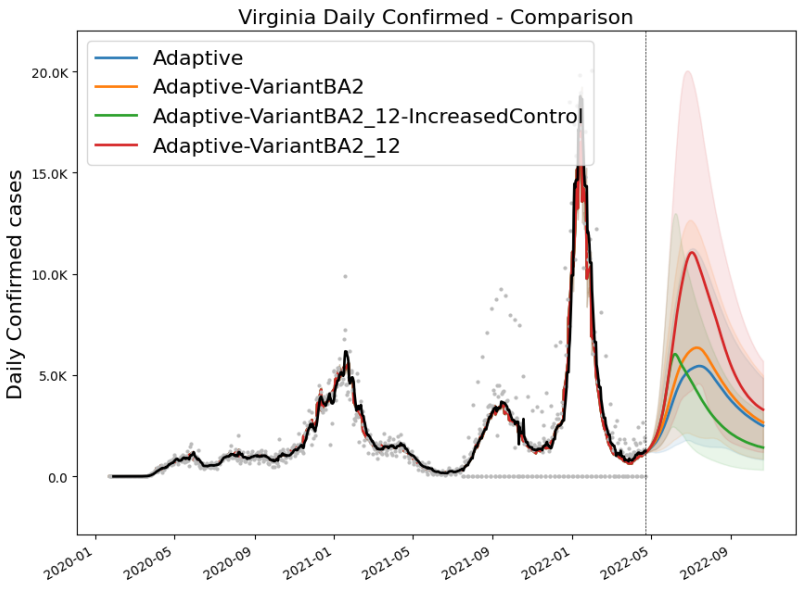
MODEL RESULTS

Updated: The current course "**Adaptive**" scenario is shown in blue. It projects a slow but steady rise, reaching 20,000 weekly cases by June and peaking at 38,000 weekly cases in mid-July.

The "**Adaptive-VariantBA2**" scenario (orange) shows a slightly faster and larger surge. It peaks at 44,000 weekly cases in early July.

The "**Adaptive-VariantBA2_12**" scenario, shown in red, projects a large surge. It reaches 40,000 weekly cases by June and peaks at nearly 77,000 in the first week of July. The new "**Adaptive-VariantBA2_12-IncreasedControl**" scenario is shown in green. It is identical to "Adaptive-VariantBA2_12" until June 1st. From there, rates quickly peak at 42,000 weekly cases in mid-June.

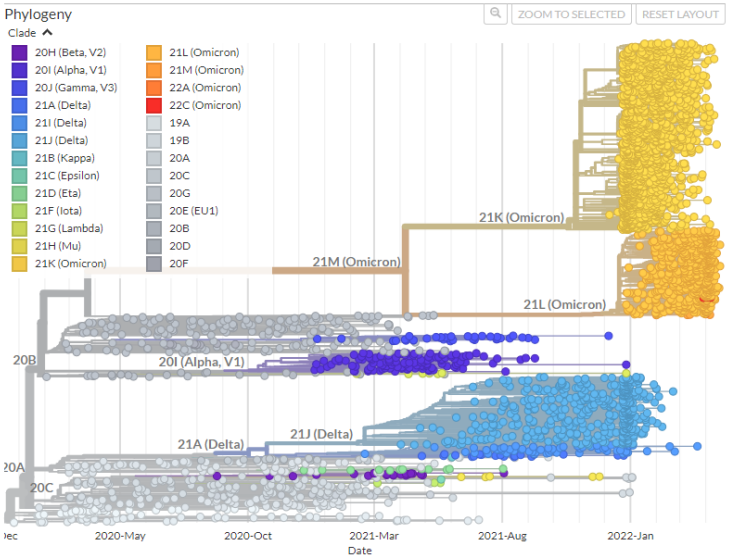
Please do your part to drive down cases. Always practice good prevention. Consider masking in indoor public areas and self-isolating when sick. Also please get vaccinated and boosted.



Date of Latest Model Run: 2022-04-27
Date of Next Model Run: 2022-05-11

OMICRON SUBVARIANTS

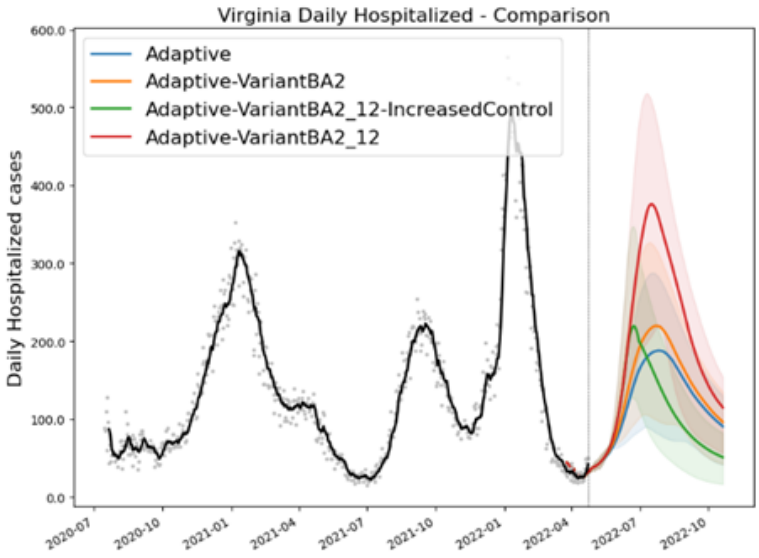
The Omicron variant of COVID-19 has spawned a surprising number of subvariants. Each case provides an additional opportunity for COVID-19 to mutate into a new variant, and the sheer volume of Omicron cases provided hundreds of millions of opportunities to create new subvariants. But Omicron may have another advantage. Researchers in Texas have identified a unique feature of Omicron that has "enabl[ed] the record number of mutations in Omicron sub-lineages". While most of these subvariants pose no additional risk compared to Omicron, the BA.2 subvariant has demonstrated a transmission advantage, supplanting the original BA.1 Omicron lineage in the US and much of the world. Another Omicron subvariant, BA.2.12.1, has begun to supplant the BA.2 variant in the US, particularly in New York and the Northeast. Early evidence suggests BA.2.12.1 is more transmissible than BA.2, but other factors such as waning immunity or behavior changes could be supporting regional spread.



Omicron has created an unprecedented number of subvariants (orange and yellow) in a short period of time. Omicron appears to have a natural advantage supporting more subvariants, but the sheer number of Omicron cases also increases the opportunity for new variants to emerge. Source: Nextstrain.

The Risk of BA.2.12.1

Nationally, COVID-19 cases have begun to rise from recent lows, particularly in the New York and the Northeast where the BA.2.12.1 is prevalent. Cases in Virginia have begun to rise as well, with 18 of 35 districts in growth trajectories (albeit from low levels). More concerning however, is that hospitalizations have begun to rise as well. It is difficult to determine whether new variants, behavior changes, or other factors are responsible for the growth in cases. However, none of Omicron's subvariants, including BA.2.12.1, appear to be more severe than the original BA.1 strain, which was less severe than the Delta variant that preceded it. Like the original Omicron variant, increasing hospitalizations are a result in the increasing large number of infections. Just as each infection provides an opportunity for new variant to emerge, each infection poses a risk of hospitalization.



Projected hospitalizations do not exceed those of the Omicron surge.

Model Projections

As noted on page 2, the UVA COVID-19 Model projects that BA.2.12.1 could drive a significant number of new COVID-19 cases in Virginia, though peaks are likely to be lower than during the Omicron surge in January. Similarly, hospitalizations are projected to be lower than the Omicron surge, though higher than peaks during the Delta wave. Hospitals and hospital staff may be pushed to capacity in some regions.

Just as behavior changes can increase transmission, improved prevention, including wearing masks when appropriate, can slow case growth. Vaccination also affects transmission, and offers significant protection against severe outcomes. As always, keep abreast of CDC Community Levels, follow prevention recommendations, and get vaccinated and boosted when eligible.