UVA COVID-19 MODEL WEEKLY UPDATE

April 15th, 2022

KEY TAKEAWAYS

- Statewide case-rates are up slightly from last week but remain low. Test positivity and hospitalizations are also at near historic lows.
- The basic reproduction number (R_e) is now slightly above one. This implies that case rates may have "bottomed out".
- The BA.2 variant is now dominant across the USA, and accounts for nearly 85% of all new cases in Virginia.
- Nine districts are now showing slow growth, with a further six in plateau. Washington, DC has also plateaued, and New York state is showing slow growth. Neighboring states are still in decline.
- Wastewater surveillance is detecting early signs of case growth.
- Models suggest that a surge is possible in the coming months. This potential wave may exceed case-rates seen during the Delta surge. However, we do not expect as many hospitalizations or deaths.

11.5 per 100k
Average Daily Cases
Week Ending April 11th, 2022

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

1,119/ 1,380
Average Daily 1st / 2nd Doses
April 11th, 2022

2,207
Average Daily Boosters
April 11th, 2022

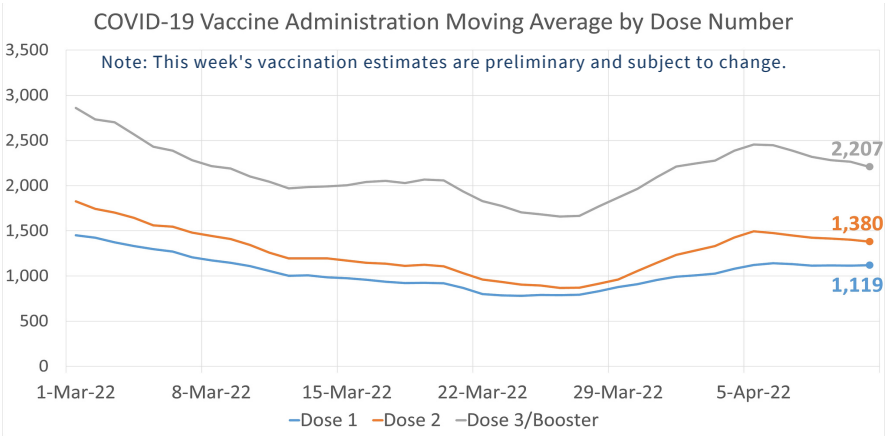
(Vaccine estimates are preliminary)

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

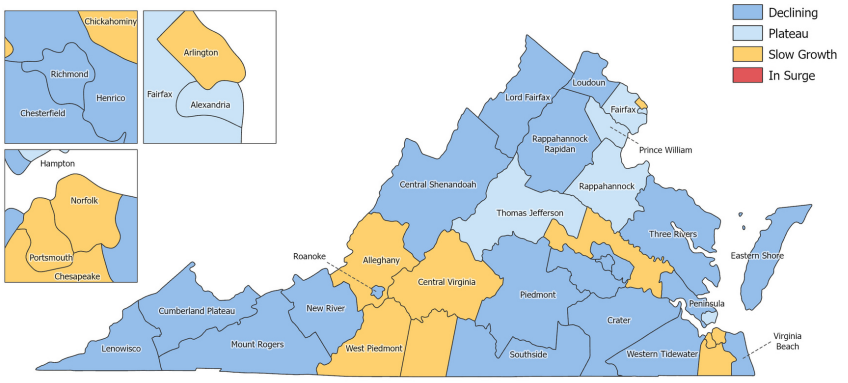
Region	R_e April 11th	Weekly Change
Statewide	**1.030**	**0.050**
Central	1.071	0.170
Eastern	1.055	-0.109
Far SW	0.837	0.073
Near SW	0.780	-0.221
Northern	1.095	0.170
Northwest	0.958	-0.092

Vaccine Administrations



Growth Trajectories: 0 Health Districts in Surge

Status	# Districts (prev week)
Declining	20 (30)
Plateau	6 (2)
Slow Growth	9 (3)
In Surge	0 (0)



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 county-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 models use various scenarios to explore the path the pandemic is likely to take under differing conditions. The CDC now estimates that the Omicron variant and its subvariants represent >99% of all new cases in Virginia. As such, we have retired all prior Delta variant-based scenarios. Current scenarios are based on the immune escape and transmission profiles of the Omicron BA.1 variant. 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.

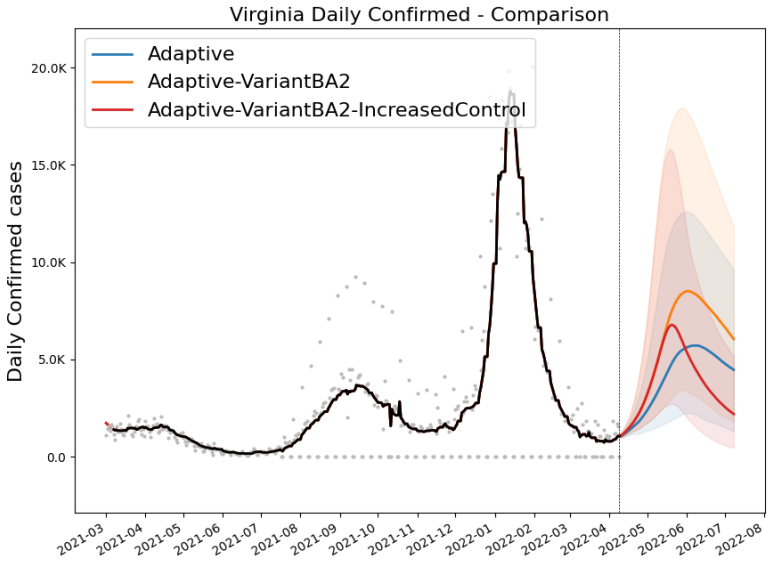
The "**Adaptive-VariantBA2**" scenario adjusts for the new Omicron BA.2 subvariant's enhanced transmissibility. It assumes that BA.2 will become dominant in April and reach 95% prevalence by May. It also assumes that BA.2 is 30% more infectious than Omicron BA.1. The new "**Adaptive-VariantBA2-IncreasedControl**" scenario adds increased mitigation strategies and seasonality to the "Adaptive-VariantBA2" scenario. These include increased home testing, masking, and self-isolation when sick. This scenario is meant to model the potential public response to a near-term BA.2 related surge. It assumes that these interventions will have a 25% reduction in community transmission and start on May 1st.

MODEL RESULTS

Updated: The current course "**Adaptive**" scenario (blue) projects a slow but steady rise, doubling our current case-rates by May, and peaking at 40,000 weekly cases in early June.

The "**Adaptive-VariantBA2**" scenario (orange) shows a faster surge, reaching 40,000 weekly cases by mid-May and peaking at about 60,000 weekly cases by mid-June. The "**Adaptive-VariantBA2-IncreasedControl**" scenario (shown here in red) is identical to "Adaptive-VariantBA2" until May 1st. From there, rates peak at 45,000 weekly cases in mid-May, then decline quickly.

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

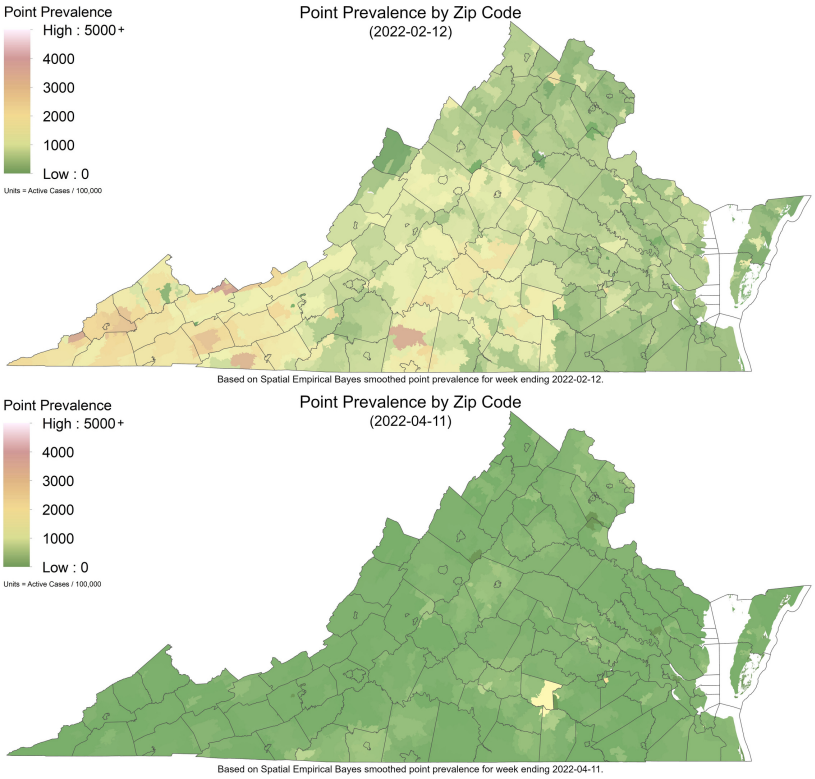


Date of Latest Model Run: 2022-04-13

Note: This week's models may be over-estimating growth based on recent data quality adjustments (QA). Data QA teams have found a few cases that were placed in cities when they should have been allocated to the surrounding county. Though health district totals do not change, moving these cases has affected the county-level metrics and resulting models. The UVA team has taken efforts to compensate for this, and we expect the issue to be corrected by the next modeling run (April 27th).

HISTORIC LOWS AND A PROJECTED RISE

For the past few weeks, the Omicron BA.2 subvariant has created some worrying surges across Europe. The United States has lagged behind in variant prevalence, but BA.2 is now dominant in Virginia. Though it does not cause more severe illness than its BA.1 predecessor, BA.2 is more transmissible. It has the potential to cause another surge in Virginia, and for the first time in months, models are projecting a significant increase in Virginian cases. Nevertheless, the Commonwealth should be better protected than Europe due to the recency of the January peak and the associated natural immunity.



From February 12th (top) to April 11th (bottom), county-level point prevalence (measuring active cases) fell precipitously. The Commonwealth is now at a low.

The Current Lull

Case-rates have risen very slightly in the last week. But after two months of sustained decline, we are still near historic lows. While Southwest Virginia and Southside were still experiencing significant case rates in mid-February, today the majority of the Commonwealth is experiencing near record low rates (left). Furthermore, statewide test positivity is at the lowest rate seen since Summer of 2021. Perhaps even more notable, aside from three days in July 2021, the current hospitalization rate is lower than it has been on any day since late March of 2020. By all statistical measures we have overcome the Omicron BA.1 wave and are now in an epidemic lull.

Signs of Trouble

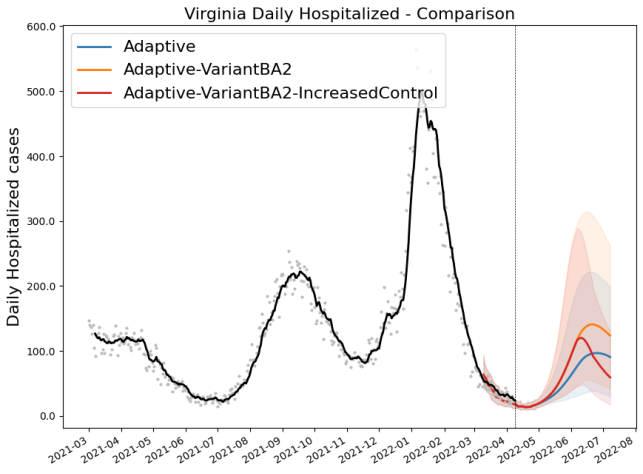
While we all enjoy the current calm, we must note that early warning systems are picking up the first signs of potential trouble on the horizon. For the first time in weeks, other states, most notably New York, are showing slow growth trajectories. None of our neighbors are showing growth yet, but Washington DC has plateaued. Internally, nine health districts are also showing slow growth, with a further six having plateaued.

Statewide, the basic reproduction number (R_e) is now slightly above 1.0, implying that case-rates may have "bottomed out" and started to rebound. Most significantly, wastewater surveillance in some parts of the Commonwealth is beginning to show increases in sewage sample viral loads. Though these data are far from definitive, we may be seeing the first signs of real sustained growth.

Model Projections

While the models do suggest that case rates may exceed those seen during the Delta surge, hospitalization rates (right) are not expected to be as dire. The Delta variant caused more severe disease than currently circulating variants, and the recency of the Omicron surge should afford us some protection. Forecasts do not show the potential surge exceeding hospital capacities but suggest that many will become infected.

Fourth dose boosters have recently been authorized for those over 50, and staying current with your COVID19 vaccination remains the most effective way to protect against severe disease, hospitalization, and death. A recent study in Nature suggests that boosted individuals not only recovered more quickly than those with only two vaccine doses, but also had 1/5th the live viral load in their nose and throats while sick. If you are eligible for a booster, please consider getting one soon.



Projected hospitalizations do not exceed those of the Delta surge.