UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

# UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

*September 2nd, 2021*

## KEY TAKEAWAYS

- COVID19 cases continue to rise at a steady pace across the Commonwealth, with 32 of 35 Health Districts in "surge".
- Increased mask usage and vaccinations across Virginia have dampened model projections slightly. We no longer expect to exceed the January peaks, total case counts could still come close to historic highs in the coming weeks.
- Modeling indicates that in the short-term, mask-usage and social distancing is the most effective countermeasure against a fall surge. But in the long-term, increased vaccinations could prevent tens of thousands of winter cases.
- It takes six weeks to achieve full vaccine efficacy. Unvaccinated persons hoping to gather for the holidays should plan now.

**36 per 100k**
*Average Daily Cases Week Ending August 29, 2021*

**60 per 100k**
*Potential Peak Average Adaptive Scenario Daily Cases, Week Ending October 3, 2021*

**8,752**
*Average Daily 1st Doses August 29, 2021*

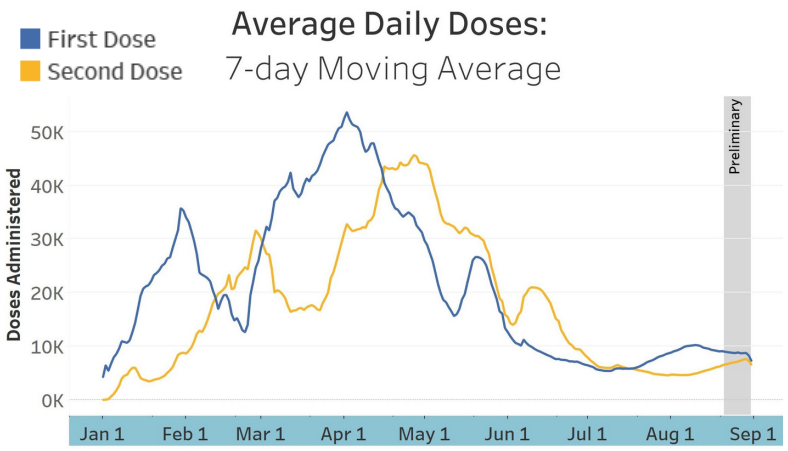
**7,623**
*Average Daily 2nd Doses August 29, 2021*

## KEY FIGURES

### Reproduction Rate
**(Based on Confirmation Date)**

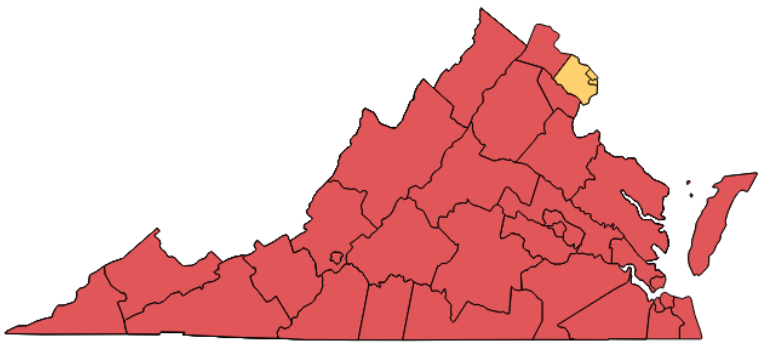
| Region | $R_e$ Aug 30th | Weekly Change |
|---|---|---|
| **Statewide** | **1.111** | **-0.007** |
| Central | 1.109 | -0.028 |
| Eastern | 1.071 | -0.021 |
| Far SW | 1.107 | -0.010 |
| Near SW | 1.107 | -0.017 |
| Northern | 1.113 | 0.023 |
| Northwest | 1.164 | 0.027 |

### Vaccine Administrations




### Growth Trajectories: 32 Health Districts in Surge

| Status | # Districts (prev week) |
|---|---|
| Declining | 0 (0) |
| Plateau | 0 (0) |
| Slow Growth | 3 (2) |
| In Surge | 32 (33) |





VIRGINIA'S HEALTH IS IN OUR HANDS. Do your part, stop the spread.

UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

# UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

## THE MODEL

The UVA COVID-19 Model and these 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 constantly. The model improves as we learn more.***

## THE SCENARIOS

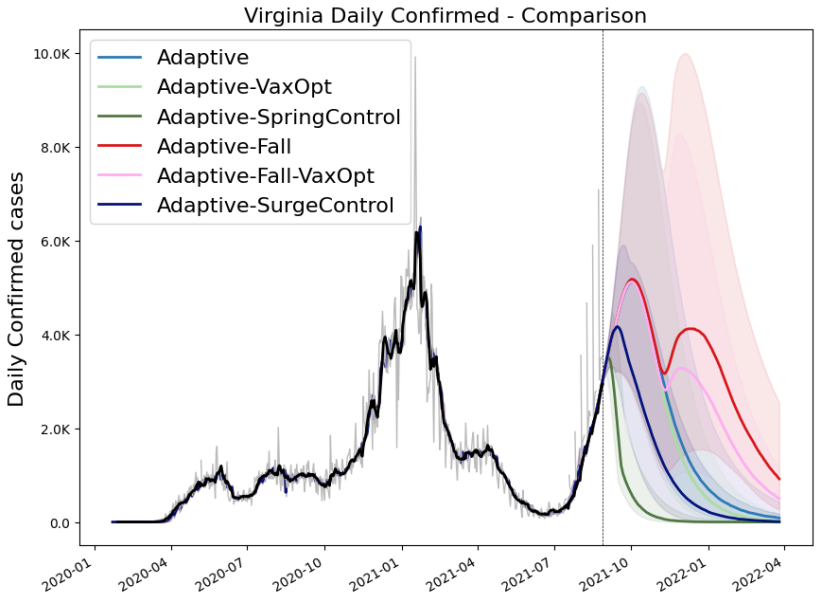
A handful of new scenarios were unveiled this week. As always, the "**Adaptive**" scenario (formerly called "Adaptive-Delta") represents the best estimate of the epidemic's current course. As Delta is now the dominant variant in Virginia, all scenarios based on other strains have been retired. The following alternative scenarios allow us to examine the potential impact of countermeasures, like vaccinating or masking, or increases in transmission.

In 2020, we saw a significant jump in transmission rates around November. That increase lead to the winter surge. Given that the transmissibility of the Delta variant is at least 60% greater than that of earlier strains, the new **"Adaptive-Fall**" scenario sets transmission rates to be 60% higher than those of Winter 2020 starting on November 1st. This scenario is identical to "Adaptive" until then, and is meant to account for possible increases in transmission due to weather and holiday travel. It generates a second peak in January but does not exceed last year's peak in part due to vaccinations and natural immunity.
The new "**Adaptive-VaxOpt**" scenario represents a more optimistic rollout of vaccinations. It assumes that statewide adult vaccine acceptance increases to 85%, and no county has a rate lower than 65%. It also assumes that starting on November 1st, children ages 5-11 become eligible for the vaccine and are vaccinated at a rate of 40% in the first month, and 10% every month after, until the statewide vaccination rate reaches 75%. This represents the best-case scenario for increasing vaccinations. The "**Adaptive-Fall-VaxOpt**" scenario combines both changes on November 1st.

The "**Adaptive-SurgeControl**" scenario is meant to examine the effects of stronger masking and social distancing efforts. It assumes that by some hypothetical combination of non-pharmaceutical interventions, the Commonwealth reduces statewide transmission rates by 25%. The "**Adaptive-SpringControl**" scenario is even more aggressive in transmission rate reductions, and imagines the outcome of dropping these rates to those of Spring 2021 levels.

## MODEL RESULTS

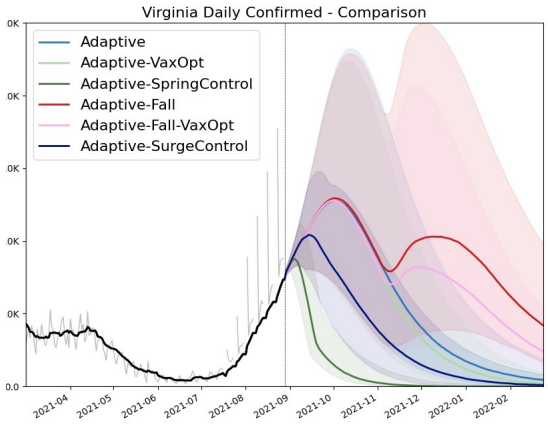
With the Delta variant dominant, models continue to project that cases will surge through the fall, reaching levels not seen since February in the next few weeks. **Cases could possibly peak at levels near previous January levels.** Vaccination rates are still below herd immunity levels and the virus has room to run. To lessen the projected peak, we must give vaccines time to have an impact. Increased mask usage and other prevention measures are already having an impact on the course of the pandemic. Do your part to stop the spread. Please continue to **practice good prevention** including masking, and **get vaccinated** as soon as eligible.



# AVOIDING A REPEAT OF LAST WINTER

Many Virginians spent Wednesday evening glued to their phones or televisions, waiting for news of flooding and severe thunderstorms induced by the passing remnants of Hurricane Ida. Some were even woken in the night by their phones when the National Weather Service issued a Tornado Watch for their hometown. In many ways, the efforts of epidemic modelers are similar to those of weather forecasters. A Tornado Watch does not mean that a tornado has been spotted or that a tornado has been predicted specifically. Rather a Tornado Watch implies that conditions are favorable for the development of thunderstorms capable of producing tornadoes. In the same way, epidemic models cannot and do not predict the exact course of an epidemic. They are meant to project possible outcomes depending on conditions and interventions. Right now, conditions are favorable for a fall surge of COVID19 cases. If nothing changes the course of this epidemic, the forecast calls for rising cases and hospitalizations across the Commonwealth.

However, there is an important difference between the weather and an epidemic. We cannot change the trajectory of a tornado, but **we can change the trajectory of this epidemic**. By masking, distancing, vaccinating, and exercising caution, each and every Virginian has the power to change the course of this epidemic. We can reduce cases, lower the burden on hospitals and health care workers, and evensave the lives of fellow Virginians. Unlike Wednesday's foul weather, this storm is not beyond our control.



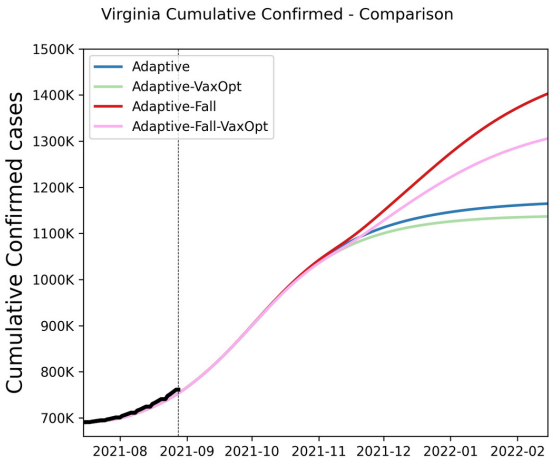

## Masking & Distancing for Today

Though vaccines are effective at protecting against hospitalization and death, modeling suggests new vaccinations will have a limited impact on the short-term surge. In the chart to the left, note that the light green and pink "VaxOpt" scenario curves largely overlap with the light blue "Adaptive" curve until mid-November. It takes 5-6 weeks for vaccines to become fully effective, so it is simply too late for new vaccines to have a large affect on the current surge.

Now look at the purple "SurgeControl" scenario curve. It begins to diverge from the "Adaptive" scenario in late September. If we could reduce transmission by masking and distancing, the models project we could avoid 150,000 cases in 2021. We can do just that by **practicing good prevention including masking**, which recent studies have shown can limit coronavirus spread considerably.

## Vaccinating Now for the Holidays

Vaccines cannot affect the current surge, but they can have a significant impact over the holiday season. On the right we see a graph of model generated cumulative case counts. Regardless of fall transmission rates, improved vaccination uptake (shown in the light green and pink "VaxOpt" curves) could substantially reduce late fall and winter case counts. According to model projections, improving vaccination rates could prevent 120,000 cases by February 2022.




Cases aside, vaccines are also very effective at protecting against hospitalization and death. Virginia hospitals are being inundated with COVID19 patients. In some cases, these patients displace those with other emergencies. Neighboring states like Tennessee are reporting shortages of ICU beds across the state. By vaccinating now you can help protect yourself as well as Virginia's hospital and healthcare personnel. **Please get vaccinated as soon as possible**. There is still time to get fully vaccinated before the holiday season!