

October 22th, 2021

KEY TAKEAWAYS

- Case rates remain high, but are continuing to decline steadily in nearly all districts.
- Model projections expect continued decline across the board.
- Vaccine "boosters" may reduce cases even further.
- Future case growth remains possible if transmission rates mirror those of Winter 2020. At the moment the Commonwealth is not following this trajectory.
- The impact of the flu season remains an unknown. It is possible that a severe flu season, in conjunction with the ongoing COVID pandemic, may push hospitals to near capacity in January of 2022.

24 per 100k

Average Daily Cases
Week Ending Oct. 17, 2021

(43 per 100k)

Adaptive Scenario
Forecast Average Daily Cases **Already Peaked**
on September 19, 2021

5,172

Average Daily 1st Doses
Oct. 17, 2021

4,551

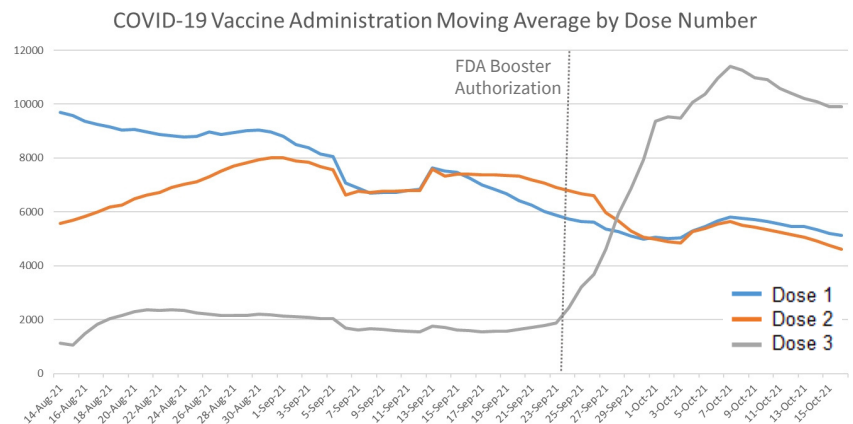
Average Daily 2nd Doses
Oct. 17, 2021

KEY FIGURES

Reproduction Rate (Based on Confirmation Date)

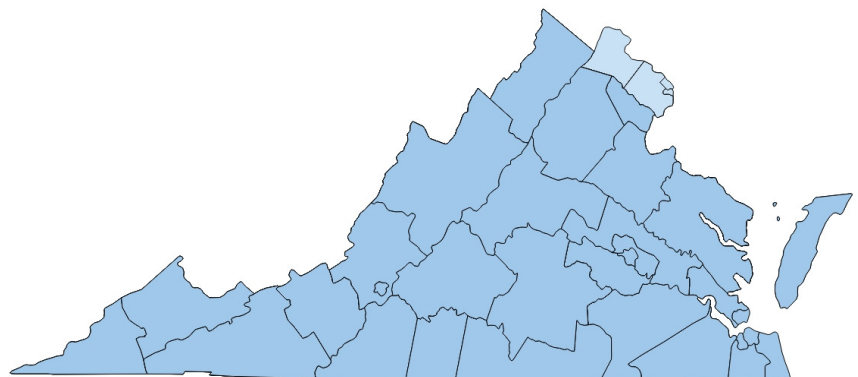
Region	R_e Oct 18th	Weekly Change
State-wide	0.879	-0.010
Central	0.818	-0.084
Eastern	0.824	-0.068
Far SW	0.869	0.011
Near SW	0.888	0.025
Northern	0.968	0.038
Northwest	0.893	0.080

Vaccine Administrations



Growth Trajectories: No Health Districts in Surge

Status	# Districts (prev week)
Declining	31 (31)
Plateau	4 (3)
Slow Growth	0 (1)
In Surge	0 (0)



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

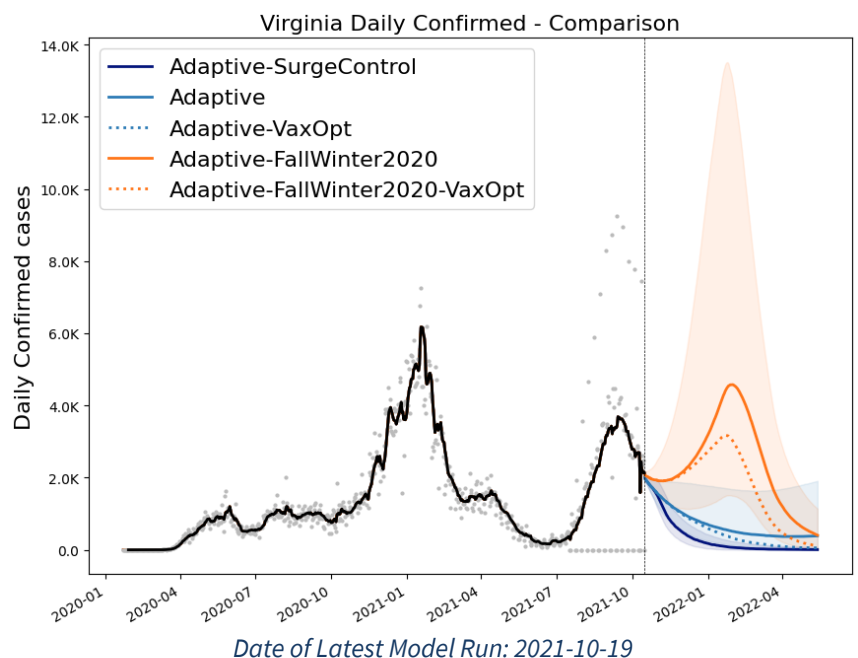
Scenarios remain unchanged from last week. The models use various scenarios to explore the path the pandemic is likely to take under differing conditions. The **Adaptive** scenario takes the current course of the pandemic at the county level, including the impact of the Delta variant and vaccines, and projects it forward. The **SurgeControl** scenario shows the likely impact of prevention and mitigation efforts (masking, social distancing, testing and isolating, etc.) by employing a 25% reduction in transmission rates. The "**FallWinter2020**" captures the transmission drivers of the entire 2020 holiday season and projects them forward. In this scenario, transmission rates from October 2021 to February 2022 are manually set to reflect the transmission rates from the same time period last year, but boosted by Delta's enhanced transmissibility.

As usual, all of these scenarios can be augmented by the **VaxOpt** (optimistic vaccine) modifier that adds to the existing scenario a hypothetical increase in vaccinations among adults and assumes vaccine eligibility for children ages 5-11 years in November. Specifically, this modifier assumes that we reach an average of 85% coverage among adults, with a minimum of 65% in each county. Note that all scenarios also include the effects of natural immunity.

MODEL RESULTS

No change from last week, the "present course" Adaptive scenario (blue), suggests that cases have peaked and are now in a gradual decline. The SurgeControl scenario (shown in indigo) again forecasts a much faster drop-off of case rates, reaching Summer 2021 lows by early December. Conversely, the FallWinter2020 (shown here in orange), projects a consistent rise in case rates possibly exceeding last January's peak.

The VaxOpt (dashed lines) scenarios, show that in the long-run, increased vaccination coverage could prevent thousands of cases in any scenario. Please do your part to stop the spread and continue to **practice good prevention**, including indoor masking, social distancing, and self-isolating when sick, and **get vaccinated** as soon as possible.



TURNING UP THE BOOST

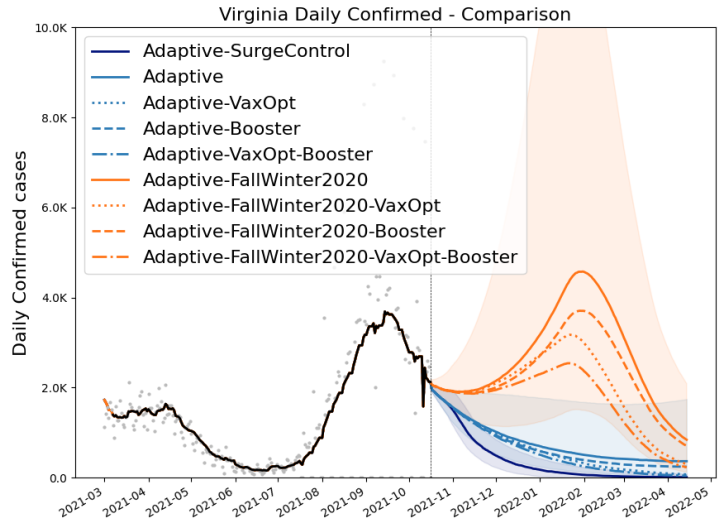
On September 22nd, the FDA authorized 3rd dose "boosters" of the Pfizer COVID19 vaccine for people over 65 years of age or with preexisting conditions that put them at higher risk for severe disease. Yesterday, the agency authorized boosters for the Moderna and Johnson & Johnson vaccines. But even before FDA authorization, as early as the start of August, thousands of Virginians were finding extra doses (see graph on page 1). In fact, the [CDC suspected that 1.1 million Americans](#) had obtained a "booster" dose by early August. This adds a new level of complexity to the models, as trying to predict who will get a booster, and when they will get it, is another unknown that must be accounted for.

To explore the effects of this, the UVA team has added a few new scenario modifiers to the existing models. We are already familiar with the **VaxOpt** scenario modifier, in which we imagine the Commonwealth is able to vaccinate 85% of adults as well as 70% of 5-11 year old children. The new **Booster** scenario modifier makes no assumptions about increased uptake by the unvaccinated, but assumes that 40% of currently vaccinated Virginians will seek a booster shot around six months after their second dose.

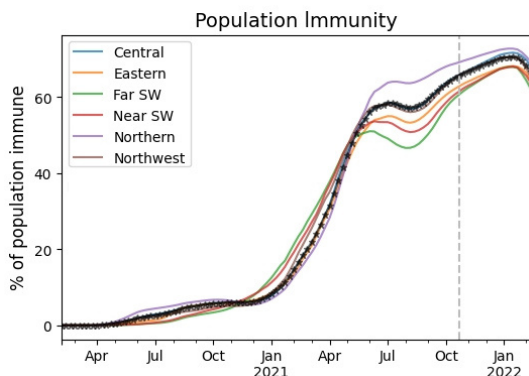
All UVA models account for waning immunity, and so in these scenarios, the booster "resets the clock" on that status. An individual who receives a third dose returns to the same level of protection they had after their second

dose (95% efficacy) and that figure begins to wane slowly over time as it does after a second dose. The **VaxOpt-Booster** scenario modifier combines the two, and assumes that we can increase adult vaccination rates to 85%, vaccinate children between 5-11 years of age, and provide boosters for 40% of those who are more than six months from their last dose.

These new scenario modifiers allow us to compare the effects of these different vaccine allocation schemes on the potential courses of the pandemic. It is evident from the graph above that regardless of which baseline scenario we follow -- the Adaptive that shows continued decline or the FallWinter2020 that projects another surge -- increased vaccination update will prevent thousands of cases. Moreover, the VaxOpt modifier outperforms the Booster modifier, respectively preventing 35,000 and 20,000 cases by May of 2022 in the Adaptive scenario. This implies that expanding vaccine coverage for unvaccinated Virginians could be more effective at reducing case loads than giving boosters to those with waning immunity. Combining both strategies is even more effective, preventing 45,000 cases by May under the Adaptive scenario. Under the FallWinter2020 surge scenario, the impact is even larger (VaxOpt: 140,000, Booster: 70,000, VaxOptBooster: 190,000 cases prevented by May).



Vaccinations Are Still Critical



The current estimated statewide population immunity is 65%. This figure includes natural immunity from prior infections, as well as vaccinations, and accounts for the waning of immunity in the time since vaccination or infection. Virginia is doing better than many of its neighbors, but we are not yet at herd immunity levels. Considering that it is possible to be co-infected with both COVID19 and the flu, that natural immunity may wane more quickly than previously expected, and that reinfections may be more serious than initial infections, we continue to strongly recommend vaccination for both COVID19 and Influenza, and boosting when eligible. Vaccination and indoor masking are the best tools we have to protect the Commonwealth.