UVA COVID-19 MODEL WEEKLY UPDATE

November 19th, 2021

KEY TAKEAWAYS

- Case rates in Virginia have leveled off. No health districts are in Surge, but several are now showing Slow Growth. Overall, Virginia's trajectory has moved from Declining to Plateau.
- Self-reported mask usage has stalled across Virginia, with 61.5% of respondents masking when in crowded public places (down from 65.5% in the first week of November).
- Booster vaccine administrations have tapered slightly, but the authorization of Pfizer vaccine for children aged 5-11 years has caused a significant increase in first time dose administrations.
- Models continue to forecast a slow decline, but also suggest that seasonal factors and holiday travel could shift our trajectory towards another winter surge rivaling that of Winter 2020.

16 per 100k
Average Daily Cases
Week Ending Nov. 14, 2021

(43 per 100k)
Adaptive Scenario Forecast Average Daily Cases ***Already Peaked*** *on September 19, 2021*

15,077/ 4,107
Average Daily 1st / 2nd Doses
Nov. 14, 2021

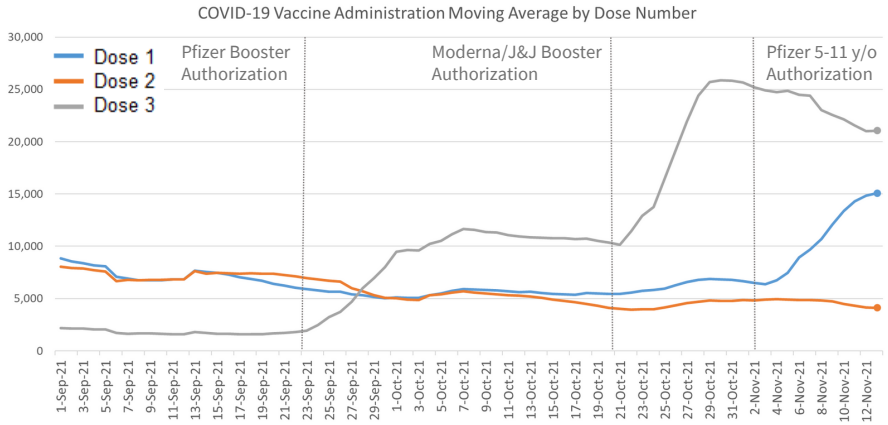
21,049
Average Daily Boosters
Nov. 14, 2021

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

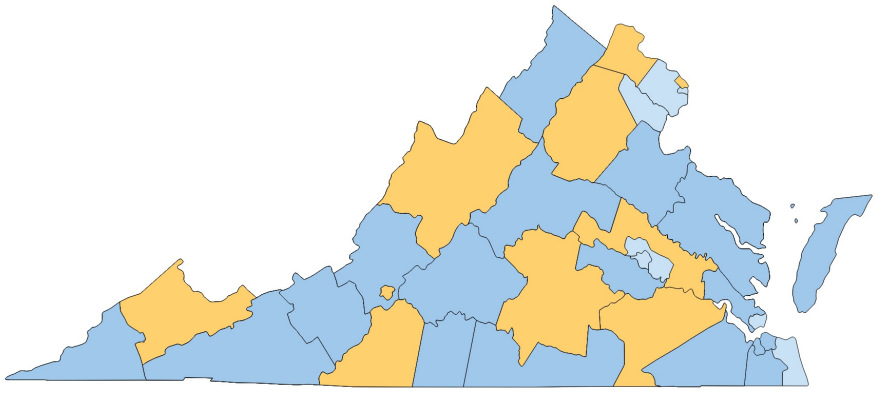
Region	R_e Nov 15th	Weekly Change
Statewide	**1.001**	**0.007**
Central	0.982	-0.032
Eastern	0.899	-0.039
Far SW	0.911	-0.060
Near SW	0.974	0.025
Northern	1.030	0.043
Northwest	0.949	-0.059

Vaccine Administrations



Growth Trajectories: No Health Districts in Surge

Status	# Districts (prev week)
Declining	18 (25)
Plateau	7 (6)
Slow Growth	10 (4)
In Surge	0 (0)



UVA COVID-19 MODEL WEEKLY UPDATE

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

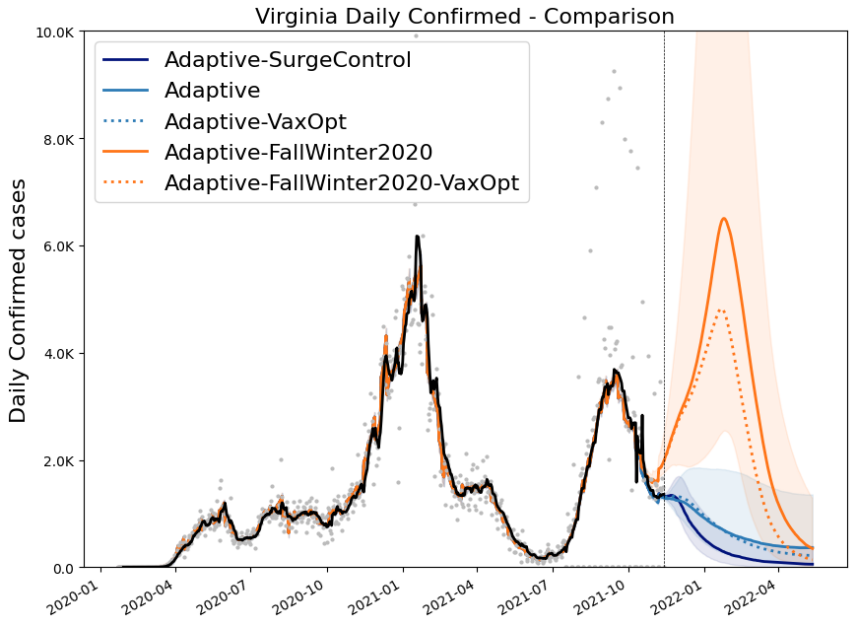
Scenarios remain unchanged from last week. The models use various scenarios to explore the path the pandemic is likely to take under differing conditions. The **Adaptive** scenario takes the current course of the pandemic at the county level, including the impact of the Delta variant and vaccines, and 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 some immunity resulting from past COVID-19 infection.

MODEL RESULTS

New info: The "present course" Adaptive scenario (blue) continues to suggest that cases have peaked and are now in a very gradual decline. The SurgeControl scenario (shown in indigo) again forecasts a much faster drop-off of case rates, now reaching Summer-2021 lows by the middle of January. The FallWinter2020 (shown here in orange), projects a rise in case rates, **now** potentially exceeding last year's peak in early 2022.

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.



Date of Latest Model Run: 2021-11-16

WATCHING FOR THE NEXT BIG WAVE

In 2004, a tsunami in the Indian Ocean decimated Indonesia. This tragedy inspired the National Oceanic and Atmospheric Administration to upgrade the detection networks protecting US soil. The new system uses several different kinds of sensors, including deep sea warning buoys, near-shore monitoring stations, and land-based seismographs. With tsunamis, early warning is key to saving lives.

We're in a similar position. Models forecast a continued decline in cases, but also show the possibility of a dangerous winter surge. With enough warning we could take steps to mitigate the next wave, but how could we see it before it is upon us? To this end, VDH is engaged in a multipronged surveillance effort to detect the next wave before it hits.

A moored surface buoy used to detect tsunamis. Source: NOAA.gov

Wastewater Surveillance

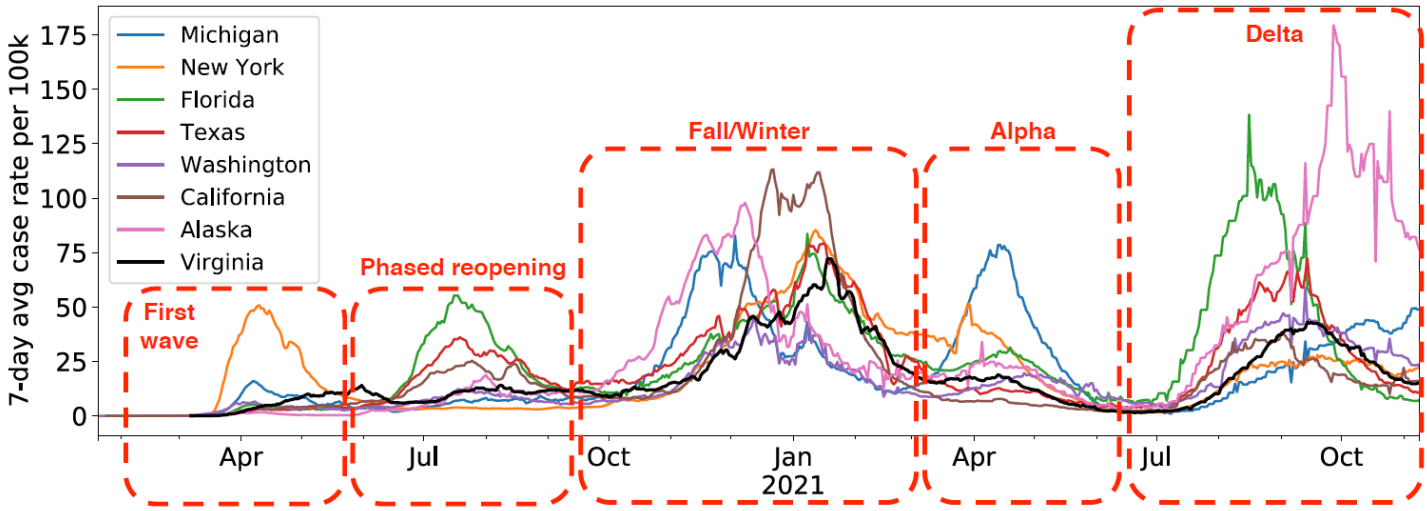
Infected individuals shed the SARS-CoV-2 virus in their bodily waste. As such viral density in sewage water can give a good estimate of the number of infected individuals in a community. In fact, these values may spike before people even feel sick, and outbreaks can be identified over a week before cases are detected by traditional means. As such, VDH is deploying 25 sentinel monitoring sites across Virginia to augment more traditional surveillance programs and give us forewarning of future outbreaks.

Metaculus Forecasts

Individuals are often wrong, but crowdsourced forecasts can be surprisingly good at capturing the intangibles that affect complex processes like an epidemic. People are better than computers at understanding sentiment and predicting human behavior. As such, VDH is working with Metaculus to leverage the power of crowdsourcing. Metaculus is able to identify its most accurate users and aggregate their predictions to make ensemble forecasts. At the moment, they estimate a 28% chance of a Winter Surge in Virginia.

Watching the Neighbors

A recent analysis of COVID19 dynamics has shown that Virginia often lags behind other key states in the timing of epidemic surges. Florida and Texas were weeks ahead of us in both the Fall/Winter 2020 wave and recent Delta wave. Michigan and neighboring Midwestern states gave us even more warning during the Fall/Winter 2020 surge, possibly as a result of cooler weather. Meanwhile, New York led us by weeks during the Alpha surge and first wave in Spring 2020. Though the cause of this lag is still under investigation, VDH and UVA are carefully scrutinizing our neighbors for any sign of an impending sixth wave.



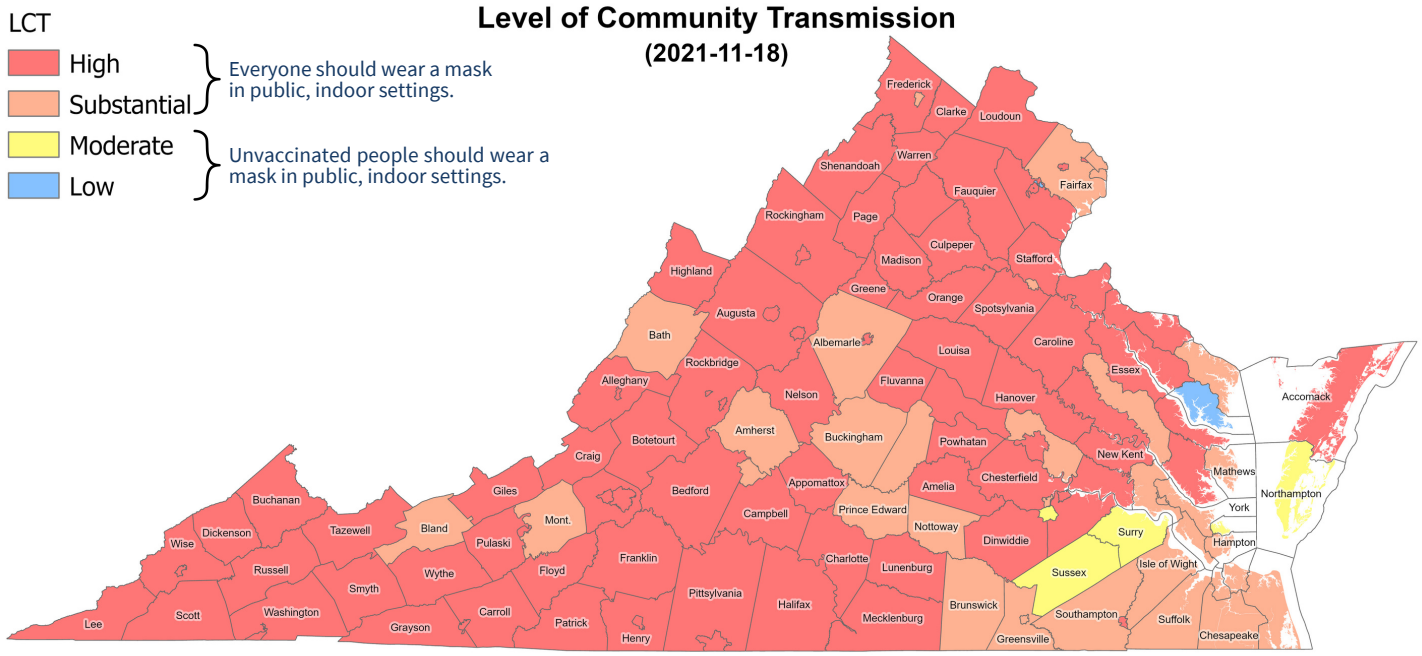
COVID-19 Dynamics of select US states across different epochs. Source: Dr. Srini Venkatramanan (UVA)

STAYING SAFE AT THANKSGIVING

The Commonwealth saw a surge of cases last winter and models suggest we could see the same this coming holiday season. Besides the weather, a major concern is holiday travel and family gatherings. Extended contact is the ideal way to propagate the virus, and long-distance travel hastens geographic spread. On the other hand, these gatherings are important traditions and an invaluable means of keeping connected to family and friends in trying times. As such, we hope that you can celebrate carefully.

VDH has detailed recommendations on how to stay safe this holiday season, most notably: 1. Get vaccinated as soon as possible and get a booster when eligible. 2. Wear a mask in indoor public places. 3. Gather outside or in well ventilated areas and maintain distance when possible. 4. Stay home if you have any symptoms of COVID-19 or other illness.

To help inform your holiday plans, we are including a map and table of the levels of community transmission in the Commonwealth, as calculated by the CDC on November 18th, 2021. You can also lookup your own county on the CDC website linked here. Stay safe and happy Thanksgiving from VDH!



Data Source: https://covid.cdc.gov/covid-data-tracker/

Locale	LCT	Locale	LCT	Locale	LCT	Locale	LCT	Locale	LCT
Accomack Co.	High	Colonial Heights City	Substantial	Halifax Co.	High	Montgomery Co.	Substantial	Rockbridge Co.	High
Albemarle Co.	Substantial	Covington City	High	Hampton City	Substantial	Nelson Co.	High	Rockingham Co.	High
Alexandria City	Substantial	Craig Co.	High	Hanover Co.	High	New Kent Co.	High	Russell Co.	High
Alleghany Co.	High	Culpeper Co.	High	Harrisonburg City	High	Newport News City	Substantial	Salem City	High
Amelia Co.	High	Cumberland Co.	Substantial	Henrico Co.	Substantial	Norfolk City	Substantial	Scott Co.	High
Amherst Co.	Substantial	Danville City	High	Henry Co.	High	Northampton Co.	Moderate	Shenandoah Co.	High
Appomattox Co.	High	Dickenson Co.	High	Highland Co.	High	Northumberland Co.	Substantial	Smyth Co.	High
Arlington Co.	Substantial	Dinwiddie Co.	High	Hopewell City	High	Norton City	High	Southampton Co.	Substantial
Augusta Co.	High	Emporia City	Substantial	Isle of Wight Co.	Substantial	Nottoway Co.	Substantial	Spotsylvania Co.	High
Bath Co.	Substantial	Essex Co.	High	James City Co.	Substantial	Orange Co.	High	Stafford Co.	High
Bedford Co.	High	Fairfax City	High	King and Queen Co.	Substantial	Page Co.	High	Staunton City	High
Bland Co.	Substantial	Fairfax Co.	Substantial	King George Co.	High	Patrick Co.	High	Suffolk City	Substantial
Botetourt Co.	High	Falls Church City	High	King William Co.	High	Petersburg City	Moderate	Surry Co.	Moderate
Bristol City	High	Fauquier Co.	High	Lancaster Co.	Low	Pittsylvania Co.	High	Sussex Co.	Moderate
Brunswick Co.	Substantial	Floyd Co.	High	Lee Co.	High	Poquoson City	Moderate	Tazewell Co.	High
Buchanan Co.	High	Fluvanna Co.	High	Lexington City	High	Portsmouth City	Substantial	Virginia Beach City	Substantial
Buckingham Co.	Substantial	Franklin City	High	Loudoun Co.	High	Powhatan Co.	High	Warren Co.	High
Buena Vista City	High	Franklin Co.	High	Louisa Co.	High	Prince Edward Co.	Substantial	Washington Co.	High
Campbell Co.	High	Frederick Co.	High	Lunenburg Co.	High	Prince George Co.	High	Waynesboro City	High
Caroline Co.	High	Fredericksburg City	Substantial	Lynchburg City	Substantial	Prince William Co.	High	Westmoreland Co.	High
Carroll Co.	High	Galax City	High	Madison Co.	High	Pulaski Co.	High	Williamsburg City	Substantial
Charles City Co.	High	Giles Co.	High	Manassas City	High	Radford City	High	Winchester City	Substantial
Charlotte Co.	High	Gloucester Co.	High	Manassas Park City	Low	Rappahannock Co.	High	Wise Co.	High
Charlottesville City	High	Goochland Co.	High	Martinsville City	High	Richmond City	High	Wythe Co.	High
Chesapeake City	Substantial	Grayson Co.	High	Mathews Co.	Substantial	Richmond Co.	High	York Co.	Substantial
Chesterfield Co.	High	Greene Co.	High	Mecklenburg Co.	High	Roanoke City	High		
Clarke Co.	High	Greensville Co.	Substantial	Middlesex Co.	High	Roanoke Co.	High		