BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE



December 23th, 2021

KEY TAKEAWAYS

- Case rates continue to grow across the Commonwealth and remain at a high level. Currently, 21 of 35 health districts are in surge trajectories, while nine are in slow growth.
- The statewide reproduction rate (R_t) is still above one.
- The Omicron scenario projects a sudden surge, reaching 15,000 daily cases in late January. This is more than twice the maximum rate seen during the Winter 2021 surge.
- Holiday travel and activities may contribute to an even larger surge.
- The <u>CDC estimates</u> that Omicron now accounts for over 75% of new cases in the mid-Atlantic region.

37 per 100k

Average Daily Cases Week Ending Dec. 19, 2021

48 per 100k

Adaptive Scenario Forecast Average Daily Cases, Week Ending on January 16, 20<u>22</u>

7,585 / 5,059

Average Daily 1st / 2nd Doses Dec. 20, 2021

24,910

Average Daily Boosters Dec. 20, 2021

KEY FIGURES

Reproduction Rate (Based on Confirmation Date)

Pegion	R _e	Weekly		
region	Dec. 20th	Change		
Statewide	1.116	-0.002		
Central	1.059	0.002		
Eastern	1.072	0.051		
Far SW	0.919	0.025		
Near SW	0.923	-0.086		
Northern	1.181	0.149		
Northwest	0.996	-0.056		

Vaccine Administrations COVID-19 Vaccine Administration Moving Average by Dose Number



Growth Trajectories: 21 Health Districts in Surge

Status	# Districts (prev week)
Declining	5 (1)
Plateau	0 (0)
Slow Growth	9 (13)
In Surge	21 (21)





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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, Infected, **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

Unchanged: 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, 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 starting next week. The **"FallWinter"** scenario captures the transmission drivers of the entire 2020 holiday season and projects them forward. In this scenario, transmission rates from December 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. The new "**Omicron**" scenario is identical to the Adaptive scenario, but adds a 30% immune escape to account for Omicron's enhanced ability to cause reinfections.

All models use <u>COVIDcast</u> surveys to estimate county-level vaccine acceptance. They then assume that vaccination uptake continues in each county until this value is reached. The new "**HighBoost**" scenario modifier is meant to examine the impact of an optimistic increase in booster doses for adults. This should not be confused with the older "VaxOpt" scenario modifier which imagined a significant boost in *first-time* adult vaccinations. Current models assume that 40% of vaccinated individuals will receive a booster. The HighBoost modifier increases this figure to 70%, and doubles the rate of deployment.

MODEL RESULTS

Updated: The "present course" Adaptive scenario (blue) shows a gradual rise in cases peaking in mid-January, 2022. Case rates are expected to rival those of the September surge. At this point, the adaptive scenario seems overly optimistic. The FallWinter scenario (orange), projects a faster rise in cases, potentially exceeding the September surge with a peak in the last week of January 2022. The HighBoost scenario (dashed blue line) shows that increased booster coverage could prevent thousands of cases in the Commonwealth.

The Omicron scenario (maroon) forecasts a quick rise in cases leading to a peak in early February of 2022 that could greatly exceed both last winter's peak and the recent Delta surge in September of 2021. Please do your part to stop the spread and continue to <u>practice good prevention</u>, including indoor masking, social distancing, and self-isolating when sick, and get <u>vaccinated and boosted</u> as soon as possible.





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WEEKLY UPDATE

STAYING SAFE DURING THE HOLIDAYS

The Omicron variant was first detected in Virginia on <u>December 9th</u>, and this week accounts for a <u>CDC estimated 75.8%</u> of all new cases in Virginia. Though there is some preliminary evidence that it may not be quite as severe as Delta, it still poses a serious health risk. Furthermore, with its increased immune escape, it has the potential to cause a significant number of reinfections, as well as another major surge. As such, we hope that you can celebrate the Holidays carefully.

The VDH has <u>detailed recommendations</u> on how to stay safe this holiday season, most notably: 1. <u>Get vaccinated</u> as soon as possible and get a booster when eligible. 2. Wear a mask in indoor public places and reconsider public indoor activities where masking is difficult (e.g. indoor dining). 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.

This map and table shows the level of community transmission in the Commonwealth as calculated by the CDC on December 22nd, 2021. You can also lookup your own county on the <u>CDC website linked here</u>. Stay safe and Happy Holidays 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	High	Halifax Co.	High	Montgomery Co.	High	Rockbridge Co.	High
Albemarle Co.	High	Covington City	High	Hampton City	High	Nelson Co.	High	Rockingham Co.	High
Alexandria City	High	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	High	Salem City	High
Amelia Co.	High	Cumberland Co.	High	Henrico Co.	High	Norfolk City	High	Scott Co.	High
Amherst Co.	High	Danville City	High	Henry Co.	High	Northampton Co.	Substantial	Shenandoah Co.	High
Appomattox Co.	High	Dickenson Co.	High	Highland Co.	High	Northumberland Co.	Substantial	Smyth Co.	High
Arlington Co.	High	Dinwiddie Co.	High	Hopewell City	High	Norton City	High	Southampton Co.	Moderate
Augusta Co.	High	Emporia City	Substantial	Isle of Wight Co.	High	Nottoway Co.	High	Spotsylvania Co.	High
Bath Co.	High	Essex Co.	High	James City Co.	High	Orange Co.	High	Stafford Co.	High
Bedford Co.	High	Fairfax City	High	King and Queen Co.	High	Page Co.	High	Staunton City	High
Bland Co.	High	Fairfax Co.	High	King George Co.	High	Patrick Co.	High	Suffolk City	High
Botetourt Co.	High	Falls Church City	High	King William Co.	High	Petersburg City	High	Surry Co.	High
Bristol City	High	Fauquier Co.	High	Lancaster Co.	High	Pittsylvania Co.	High	Sussex Co.	High
Brunswick Co.	Moderate	Floyd Co.	High	Lee Co.	High	Poquoson City	High	Tazewell Co.	High
Buchanan Co.	High	Fluvanna Co.	High	Lexington City	High	Portsmouth City	High	Virginia Beach City	High
Buckingham Co.	High	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.	High	Washington Co.	High
Campbell Co.	High	Frederick Co.	High	Lunenburg Co.	High	Prince George Co.	High	Waynesboro City	High
Caroline Co.	High	Fredericksburg City	High	Lynchburg City	High	Prince William Co.	High	Westmoreland Co.	High
Carroll Co.	High	Galax City	High	Madison Co.	High	Pulaski Co.	High	Williamsburg City	High
Charles City Co.	High	Giles Co.	High	Manassas City	High	Radford City	High	Winchester City	High
Charlotte Co.	High	Gloucester Co.	High	Manassas Park City	High	Rappahannock Co.	High	Wise Co.	High
Charlottesville City	High	Goochland Co.	High	Martinsville City	High	Richmond City	High	Wythe Co.	High
Chesapeake City	High	Grayson Co.	High	Mathews Co.	High	Richmond Co.	High	York Co.	High
Chesterfield Co.	High	Greene Co.	High	Mecklenburg Co.	High	Roanoke City	High		
Clarke Co.	High	Greensville Co.	Substantial	Middlesex Co.	High	Roanoke Co.	High		

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