UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

January 14th, 2022

KEY TAKEAWAYS

- Case rates continue to grow across the Commonwealth and are now at historic highs. Early signs suggest this growth may be slowing, but all 35 health districts are still in surge.
- Models project a continued steep rise in cases with a peak around January 23rd. Case rates may fall just as sharply after the peak.
- Omicron is less severe than Delta, but this surge is causing a large increase of hospitalizations, which could reach record levels in the coming weeks.
- Vaccines and boosters remain very effective at protecting against hospitalization and death from the Omicron variant.
- The CDC estimates that the Omicron variant now accounts for about 98% of new cases in the mid-Atlantic region.

188 per 100k
Average Daily Cases Week Ending Jan. 9, 2022

673 per 100k
Omicron Scenario Forecast Average Daily Cases, Week Ending on Jan. 23, 2022

6,700 / 4,315
Average Daily 1st / 2nd Doses Jan. 10, 2021

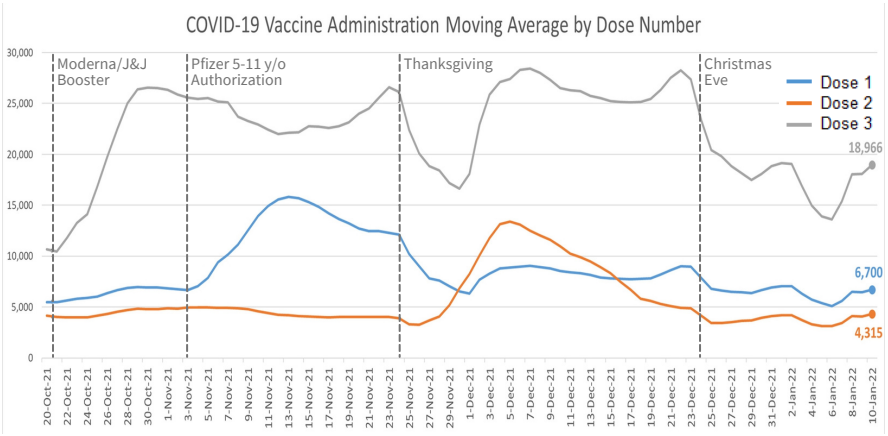
18,966
Average Daily Boosters Jan. 10, 2021

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

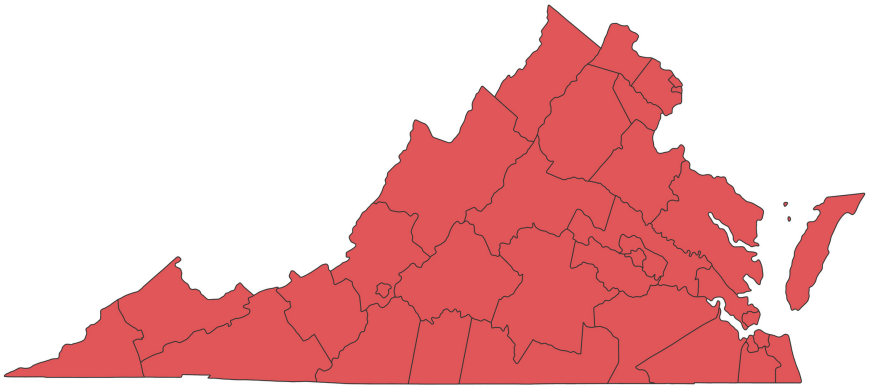
Region	R_e Jan. 10th	Weekly Change
Statewide	**1.082**	**-0.076**
Central	1.048	-0.122
Eastern	1.129	-0.084
Far SW	1.118	0.003
Near SW	1.154	-0.070
Northern	1.037	-0.100
Northwest	1.111	-0.102

Vaccine Administrations



Growth Trajectories: All 35 Health Districts in Surge

Status	# Districts (prev week)
Declining	0 (0)
Plateau	0 (0)
Slow Growth	0 (0)
In Surge	35 (35)



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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, **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

Unchanged: The models use various scenarios to explore the path the pandemic is likely to take under differing conditions. The **"Adaptive"** scenario continues to track the current course of the pandemic assuming that the Delta variant remains dominant. Though genomic surveillance data is still pending, CDC estimates suggest that the Omicron variant has largely displaced it. This model scenario is retained for comparison purposes but will likely be retired in the coming weeks.

All other model scenarios are based on the immune escape profiles of the new Omicron strain. "**Adaptive-Omicron**" assumes that Omicron is as transmissible as Delta, but with an added immune escape of 80%. This figure has been updated from 30% since the last model run. The **"Adaptive-Omicron-SurgeControl"** scenario shows the likely impact of prevention and mitigation efforts (masking, social distancing, testing and isolating, etc.) on the impending Omicron surge. This is done by employing a 25% reduction in transmission rates starting next week. The **"Adaptive-Omicron-FallWinter"** scenario captures the transmission drivers of the entire 2020 holiday season and projects them forward. In this scenario, transmission rates from January 2021 to February 2022 are manually set to reflect the sharply rising and then falling transmission rates from the same time period last year, but boosted by Omicron's enhanced transmissibility and immune escape.

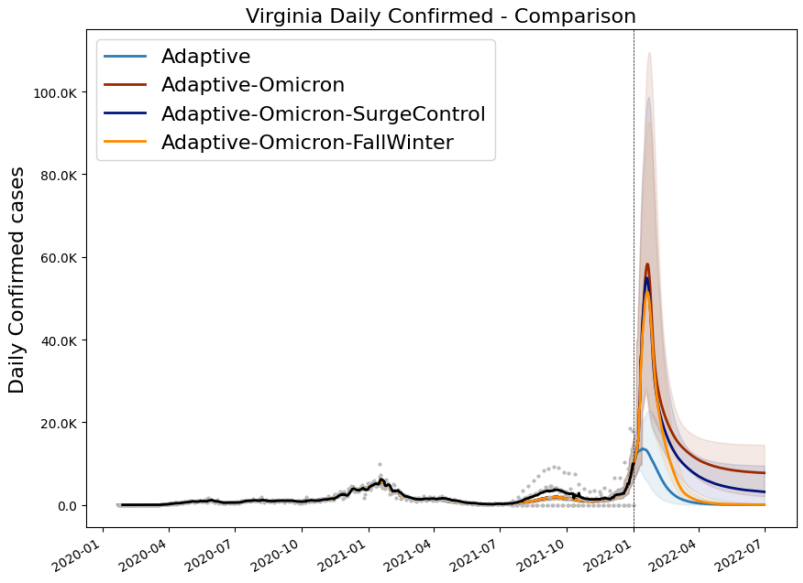
All model scenarios use COVIDcast surveys to estimate county-level vaccine acceptance. They then assume that vaccination uptake continues in each county until this value is reached and 40% of vaccinated individuals will receive a booster.

MODEL RESULTS

Unchanged: The Delta-dominant "**Adaptive**" scenario (light blue) shows a continued gradual rise in cases, peaking in mid-January at around 95,000 cases per week. Given Omicron's displacement of Delta, this seems overly optimistic.

All three Omicron scenarios are largely identical in the short term. They project a continued sharp rise in cases, peaking around 350,000-400,000 cases per week in the second half of January. The difference between these three scenarios is in the decline after the peak.

The "**Omicron**" scenario (maroon) forecasts a gradual decline. The "**SurgeControl**" scenario (purple) shows a steeper decline into April. The "**FallWinter**" scenario (orange) shows a drop off matching the one seen last winter, reaching a rate of fewer than 30,000 weekly cases by the middle of March.



Date of Latest Model Run: 2022-01-05

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 and boosted when eligible.