UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

June 4th, 2021

KEY TAKEAWAYS

- Both COVID-19 case rates and daily vaccine doses administered continue to decrease.
- Vaccination coverage continues to slowly but steadily increase across VA, but huge disparities and pockets of low coverage exist.
- The United States did poorly with excess death largely due to COVID-19 compared to other industrialized nations in 2020.
- The Delta variant of concern, which caused India's huge recent surge in cases and deaths, is becoming more common in the United States.

10 per 100k
Average Daily Cases Week Ending May 30, 2021

36 per 100k
Potential Peak Average Fatigued Control Scenario Daily Cases, Week Ending August 15, 2021

22,668
Average Daily 1st Doses May 23, 2021

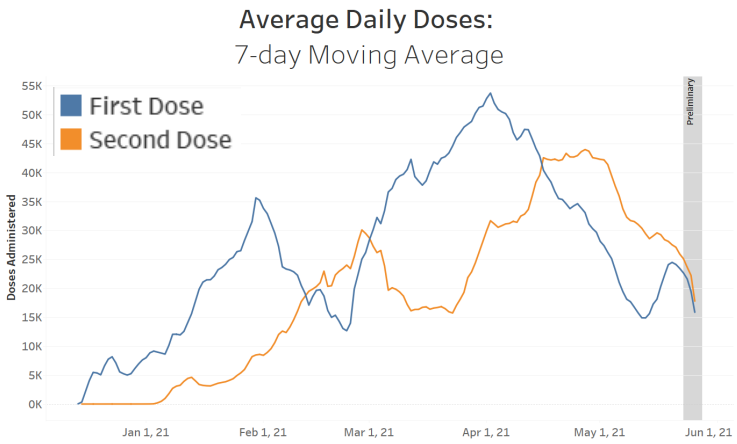
25,124
Average Daily 2nd Doses May 23, 2021

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

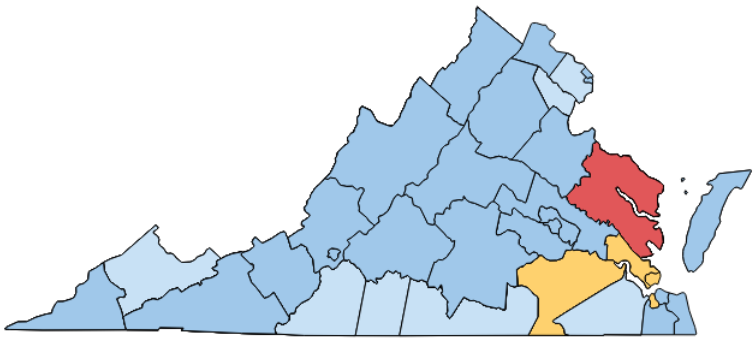
Region	R_e May 31	Weekly Change
Statewide	**0.860**	**0.091**
Central	0.886	0.064
Eastern	0.940	0.126
Far SW	0.771	-0.034
Near SW	0.908	0.085
Northern	0.750	0.003
Northwest	0.878	0.190

Vaccine Administrations



Growth Trajectories: 1 Health District in Surge

Status	# Districts (prev week)
Declining	23 (30)
Plateau	7 (4)
Slow Growth	4 (1)
In Surge	1 (0)



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

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THE MODEL

The UVA COVID-19 Model and the 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 (S)usceptible, (E)xposed, (I)nfected, (R)ecovered epidemiologic model designed to evaluate policy options and provide projections of future cases based on the current course of the pandemic.

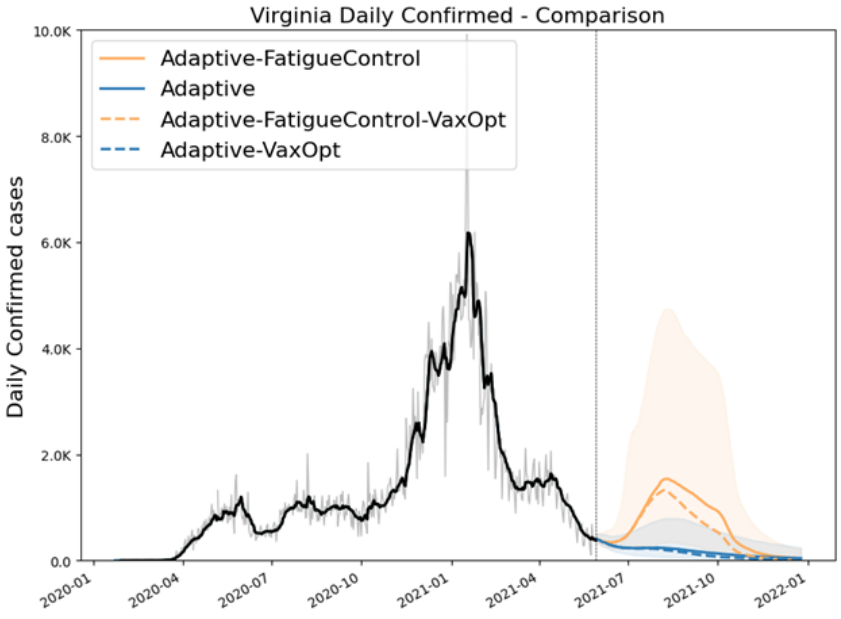
COVID-19 is a novel virus causing a global pandemic and response. The model improves as we learn more about it.

THE PROJECTIONS

The UVA team continues to improve the model weekly. The UVA model uses an "adaptive fitting" methodology, where the model traces past and current trends and uses that information to predict future cases at the local level. The model incorporates projections on the impact of vaccines, which will improve over time. Since the B.1.1.7 Variant has become dominant, the model includes increased transmission and severity associated with this Variant of Concern. The model also includes "what-if" or planning scenarios. The "Fatigued Control" scenario identifies the highest transmission rates seen during summer 2020 and projects those forward. The "VaxOpt" scenario compares the status quo vaccine acceptance levels to optimistic levels.

MODEL RESULTS

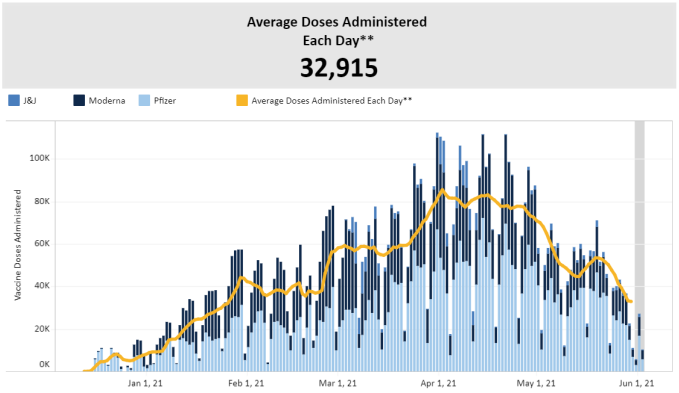
With the B.1.1.7 variant becoming predominant, the model shows a continued decline in new weekly cases along the current course, but warns of a surge in cases that could occur if Virginians relax precautions. Under the current course, model scenarios show that cases peaked at **68 average daily cases** per 100,000 residents during the week ending **January 24th**. However, under a worst case scenario, if Virginians relax their behavior for a sustained period as Variants of Concern take hold, cases could reach another smaller peak with **36 average daily cases** per 100,000 the week ending **August 15th**. To lessen the projected peak, we must give vaccines time to have an impact, especially as the B.1.1.7 variant is the predominant strain in Virginia. **Do your part to stop the spread. Continue to practice good prevention and get vaccinated when eligible.**



Vaccination Coverage Across the Commonwealth

Currently, 41% of Virginians are fully vaccinated and an additional 10% are partially vaccinated. Last week, Virginia administered about 48,500 vaccine doses per day, which is a 32% decline from last week and a 57% decline from last month. Vaccination coverage varies widely across Virginia. Albemarle County has the highest coverage, with 66.9% of residents having received at least one dose, followed by Goochland County (61.4%) and Lancaster County (59.5%).

Counties with the lowest coverage include Patrick (32.7%), Carroll (32.6%), and Lee (31.8%). These disparities are very apparent among younger age groups. 66.8% of those aged 20-29 have received at least one vaccine dose in Albemarle County, compared to only 17.7% of 20-29 year olds in Lee County. These stark contrasts in vaccine coverage across Virginia leave many localities vulnerable to potential COVID-19 outbreaks.



This graph shows COVID-19 Vaccine Administrations by Day in Virginia, as reported by the VDH COVID-19 Vaccine Summary.

Current Cases and Recent Deaths

Case counts are fortunately continuing to decline across the Commonwealth, despite the slowing of vaccinations and large disparities in vaccination coverage. According to Washington Post data, new daily reported cases in Virginia dropped 36.4% in the last week to the lowest rate since April 2020. The United States as a whole is also continuing to see improvements. The 7-day average of COVID-19 cases reported across the country declined 30.7% in the last week and 68.1% in the last month, according to CDC data.

Though the nation is currently doing well, a recent study by The BMJ shows that the US did a poor job of preventing excess deaths caused by COVID-19 in 2020. When compared to other high income countries, the US was ranked as having the 6th highest rate of excess deaths in 2020, out of 29 countries.

The figure above shows the age adjusted rate per 100,000 population as calculated using the model by Islam and co-authors: http://bit.ly/BMJxsm

Delta Variant

As the COVID-19 outlook continues to improve, it is important to be aware of potential complications that may arise. The B.1.617.2 variant, also referred to as the Delta variant, was originally detected in an outbreak in India. The WHO considers this variant to be of global concern, as it has now spread to 62 countries. Though the Delta variant currently represents 1.3% of COVID-19 cases in the US, research suggests that this variant is spreading at a much faster rate compared to B.1.1.7 and may also escape immunity more easily.

As restrictions end and vaccine administration continues to slow, it's important that unvaccinated Virginians continue to use masks and get vaccinated as soon as possible.