VIRGINIA

COVID-19 Update June 17th, 2021

Carter C. Price, Ph.D.

A team of RAND researchers was asked by the Commonwealth of Virginia to review available information on COVID-19 models of the Commonwealth to determine the strengths and weaknesses of each model and their relevance to decisionmaking. The information in this presentation is intended to keep policymakers abreast of the latest findings of the research team.

This research was sponsored by the Commonwealth of Virginia and conducted by the RAND Corporation. RAND is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. For more information, visit www.rand.org.

Bottom Line Up Front

Case Rate

Confirmed cases have declined from last week to 145 per day (-29%)
- This is 89 percent lower than the mid-March low of 2021 and 68 percent below the summer lows of 2020

COVID hospitalizations have decreased to 385 (-3%)

Vaccination is continuing to increase with at least 48 percent of the population fully vaccinated
- With the current trends, community immunity from vaccination will not be reached statewide before the fall

Case rates are below the lows of 2020, and the trend is for a sustained decline
- The pandemic is not over, but many parts of Virginia are ready to enter the recovery phase, which entails activities to promote the return to normal
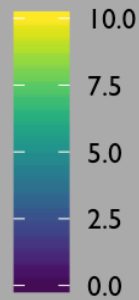- However, given the continued threat of COVID variants, preparation activities for future phases should be ongoing

Cases are relatively low across the Commonwealth

CASE COUNT
Source: VDH

Cases per 100,000
10.0
7.5
5.0
2.5
0.0

These data were updated June 16th and represent a seven-day average of the previous week

Yellow indicates at least 10 cases per 100,000

Case levels have drifted lower across the Commonwealth

- 3 percent of counties have more than 10 cases per 100,000 (101,000 Virginians live in these counties)
- 84 percent of counties have fewer than 5 cases per 100,000 (8,124,000 Virginians live in these counties)

When cases are this low, even the weekly values can be volatile

Case level trends for neighboring states were mostly down last week

Over the last 7 days, Virginia had 1.7 new confirmed cases per day per 100,000 (-13% from last week)

Very high case loads (>20):

High case loads (10-20):

Lower case loads (<10): None
- Kentucky (5.1 new cases per 100k, -21% from last week)
- West Virginia (4.7, -13%)
- North Carolina (3.4, -15%)
- Tennessee (2.4, +29%)
- District of Columbia (1.9, -13%)
- Maryland (1.4, -24%)

These data were updated June 16th and represent a seven-day average of the previous week

Variants could increase the rate of spread

The CDC has Identified five variants of concern that spread more rapidly than the baseline variant and may lead to more reinfection

- All five variants of concern have been detected in Virginia

The CDC has projections of the June 5th prevalence for HHS Region 3 (DE, DC, MD, PA, VA, and WV) based on genomic testing from May 9th to May 22nd

- B.1.1.7 ("U.K. variant") is estimated to be 71.0 percent of cases in the region
- B.1.617.1-3 ("Indian variants") are estimated to be 5.7 percent of the cases in the region
- P.1 ("Brazilian variant") is estimated to be 4.6 percent of cases
- B.1.351 ("South African variant") is estimated to be 0.9 percent of cases
- B.1.427/B.1.429 ("California variants") are estimated to be 0.2 percent taken together

Additionally, there are several variants of interest that have been detected in the region

- B.1.526/B.1.526.1 /B.1.526.2 ("New York variants") are estimated to total 11.0 percent

48 percent of Virginians are fully vaccinated, and an additional 9 percent are partially vaccinated

Age	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+	Total*
Fully Vaccinated	0	247,487	469,659	545,709	579,747	682,322	697,379	476,633	226,554	4,122,956
% Full	0.0%	22.5%	40.7%	46.5%	53.9%	60.6%	71.4%	77.6%	72.8%	48.3%
Partially Vaccinated	0	122,072	111,363	111,580	104,197	109,086	94,878	55,834	30,637	764,637
% with Partial	0.0%	11.1%	9.6%	9.5%	9.7%	9.7%	9.7%	9.1%	9.8%	9.0%
Confirmed Cases	32,664	74,292	130,576	110,201	98,914	96,786	65,780	35,261	24,988	678,226
% Confirmed Cases	3.3%	6.8%	11.3%	9.4%	9.2%	8.6%	6.7%	5.7%	8.0%	7.9%

*The total includes those without reported age information
Source: VDH, June 16th

Vaccinations have slowed substantially from the peak
- Over the last seven days, Virginia has averaged 28,284 doses per day (+13% from last week and -63% from April)
- At this pace, the vaccination levels needed for community immunity will not be reached across the Commonwealth before September of 2021

A Kaiser Family Foundation poll from May 28th indicated hesitancy has continued to decline
- There is a small but consistent portion of the population resistant to receiving a vaccine (roughly 20 percent)
- One third of the unvaccinated population say they will "wait and see" about the vaccine
- 44 percent of the "wait and see" population report that they will get it when the FDA provides full approval
- One third of parents of children 12 to 17 years of age are not planning to vaccinate their children and 40 percent of parents of children under 12 years of age do not intend to vaccinate if the vaccine is approved

Share of the Total Population with at Least One Dose
Source: VDH

Percent of the Total Population with at Least one Dose

60
50
40

These data were updated June 16th
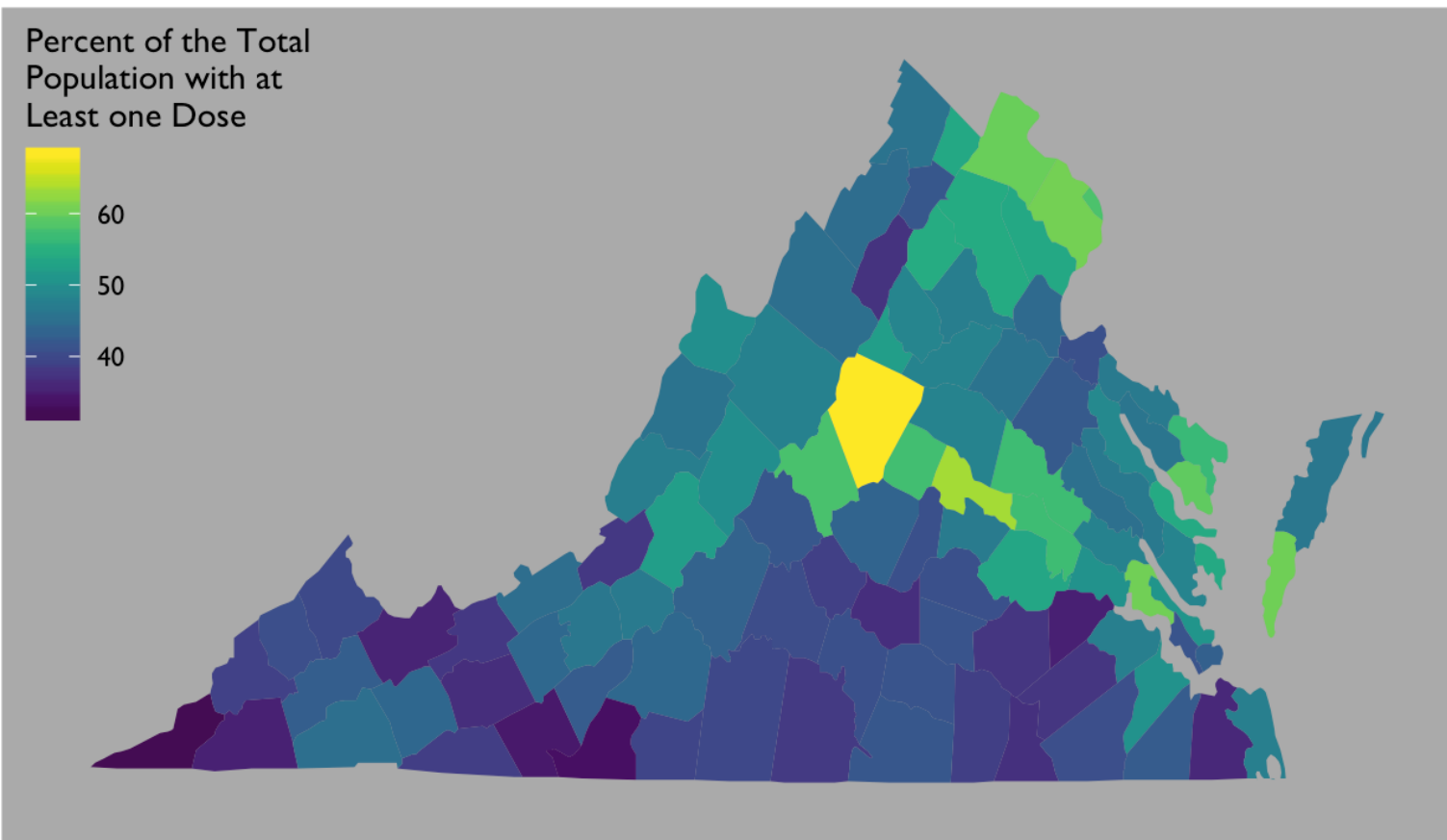
**The population with at least one dose varies by county**

- 37 counties (4.1 million Virginians) have more than 50 percent of their total population vaccinated (up from 32 counties and 4.0 million Virginians)
- 27 counties (1.0 million Virginians) have less than 40 percent of their total population vaccinated (down from 32 counties and 1.1 million Virginians)

Community immunity is estimated to require a vaccination rate around 70 to 80 percent for the total population

Vaccination rates among neighboring states vary substantially

At Least One Dose

- (56% to 60%]
- (52% to 56%]
- (48% to 52%]
- (44% to 48%]
- (40% to 44%]
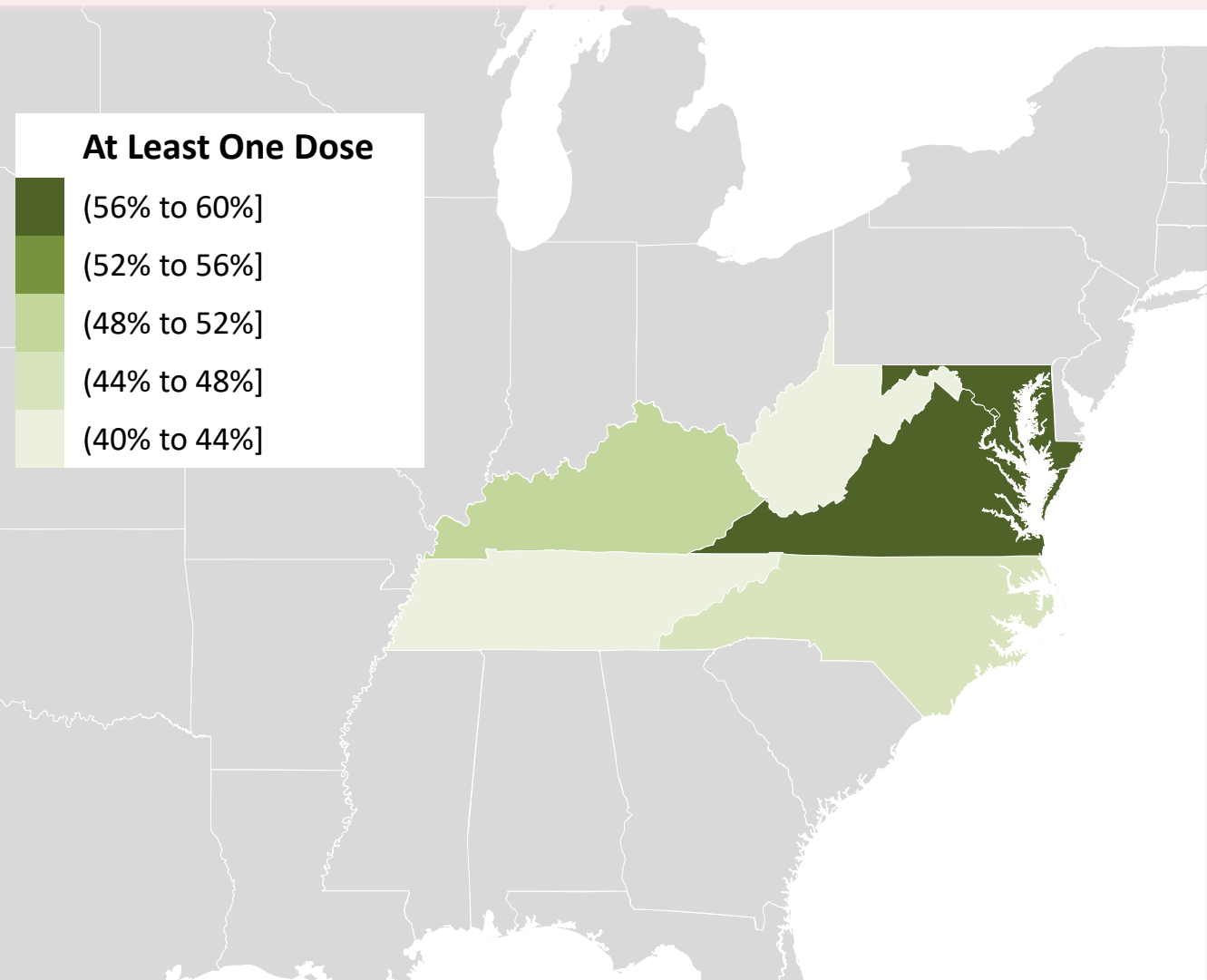
	Partially Vaccinated*	Fully Vaccinated*
Nationwide	**9.4%**	**42.3%**
D.C.	9.6%	49.6%
Kentucky	7.2%	41.0%
Maryland	7.0%	53.0%
North Carolina	6.2%	38.1%
Tennessee	6.6%	33.9%
Virginia**	**8.3%**	**49.3%**
West Virginia	6.4%	35.8%

* Total population, includes out-of-state vaccinations

**Differs from previous slide because all vaccination sources (e.g., federal) are included

Source: https://covid.cdc.gov/covid-data-tracker/#vaccinations

These data were updated June 16th

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We've been monitoring recent, relevant literature

Kumar et al. performed a retrospective study of genomic surveillance data in India to determine when the second wave could have been predicted
- They found that the first indications of a second COVID wave in India occurred in January of 2021 and that by March 2021 it was clearly predictable
- The authors propose a genomic surveillance approach that could be used to predict future waves of COVID

Chalfin et al. examined the relationship between COVID-19, alcohol consumption, and domestic violence
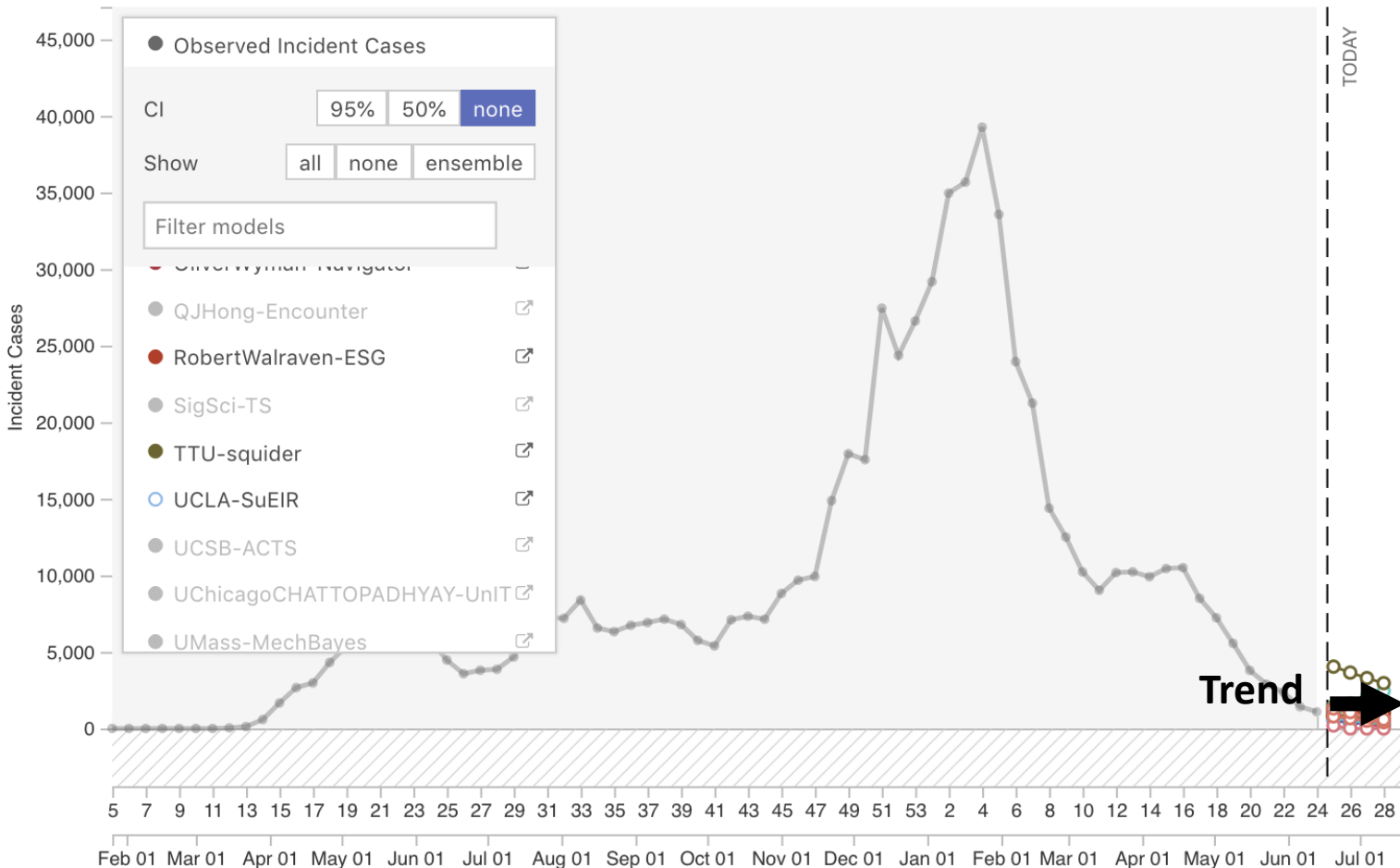- Using 911 call data and high-resolution alcohol consumption data from bars and liquor stores in Detroit, MI, the authors found that alcohol consumption was associated with higher domestic violence risk and that this relationship was stronger during the pandemic than beforehand
- Additional resources may be needed to mitigate the long-term negative effects associated with the rise in domestic violence

Chevalier et al. used geospatial data to understand the implications of expanding the geographic distribution of vaccinations on uptake by demographic group
- Specifically, the authors use data on the distance to retail pharmacies providing vaccinations and the subsequent vaccine uptake
- The authors then run a counterfactual using other retailers as providers to estimate the increase in uptake
- For Virginia, the share of the population within one mile of a vaccination site could increase from 43 percent to 57 percent if additional retailers were included

The model estimates forecast a flattening in cases over the coming weeks
- A few models are predicting a small increase in cases

Many of the model predictions lag the data
- This means that they match the trends in retrospect but not as forecasts

Modeling will be less useful for forecasts with the current decline in cases
- Surveillance efforts will be key to the early identification of potential outbreaks
- Contact tracing efforts have proven effective in containing low levels of spread
- Modeling can support both surveillance and test-and-trace

Source: COVID-19 Forecast Hub, https://viz.covid19forecasthub.org/
Accessed June 16th

What should we look out for in the next few months?

We expect to see a continued decline in cases in Virginia, but there are some things that could change

Summer travel (early July to early September) could lead to increases in cases
- Last year, cases grew rapidly in the Southeast in early July and cases in other parts of the Commonwealth rose in subsequent months

A hurricane (late August to October) that causes evacuations could increase the spread both in the affected areas and areas receiving evacuees
- The hurricane return periods for Virginia's coastline range from 13- to 15-years and a hurricane could be a major disruption for the Central, Eastern Hampton Roads, and Northern Regions
- A hurricane that made landfall in North Carolina (return periods range from 5- to 7-years) would be more likely to affect the Southside and Central Regions

Future variants could bypass natural or vaccine-acquired immunity
- At this point in time, the vaccines appear to protect again the variants of interest and concern

These risks are not uniformly spread by geography or demographics
- Immunity is lower in the southern counties and among younger people

Estimated Share of the Total Population with Immunity from at Least One Dose or Prior Infection

Population with Natural or Vaccine-Induced Immunity

- 0.70
- 0.65
- 0.60
- 0.55
- 0.50
- 0.45

These data were updated June 16th

These estimates are based on VDH case data and vaccination rates

- This assumes people with a prior COVID infection are equally likely to get vaccinated

The distribution of immunity is a more evenly distributed than the vaccination levels because vaccination levels are negatively correlated with cases

- Roughly, 63 percent of the total population has some level of immunity
- The county level of immunity ranges from 41 percent to 72 percent

Discussion and Questions