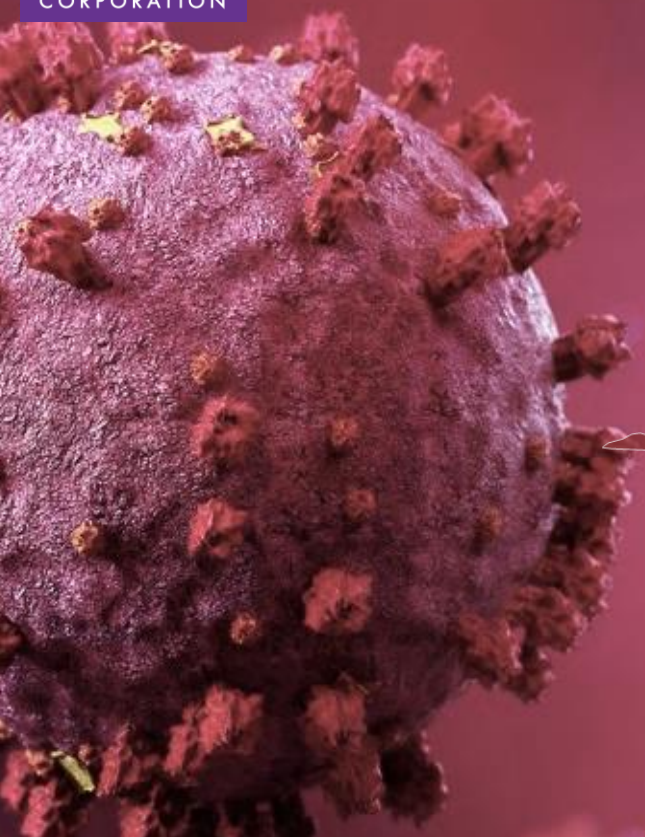
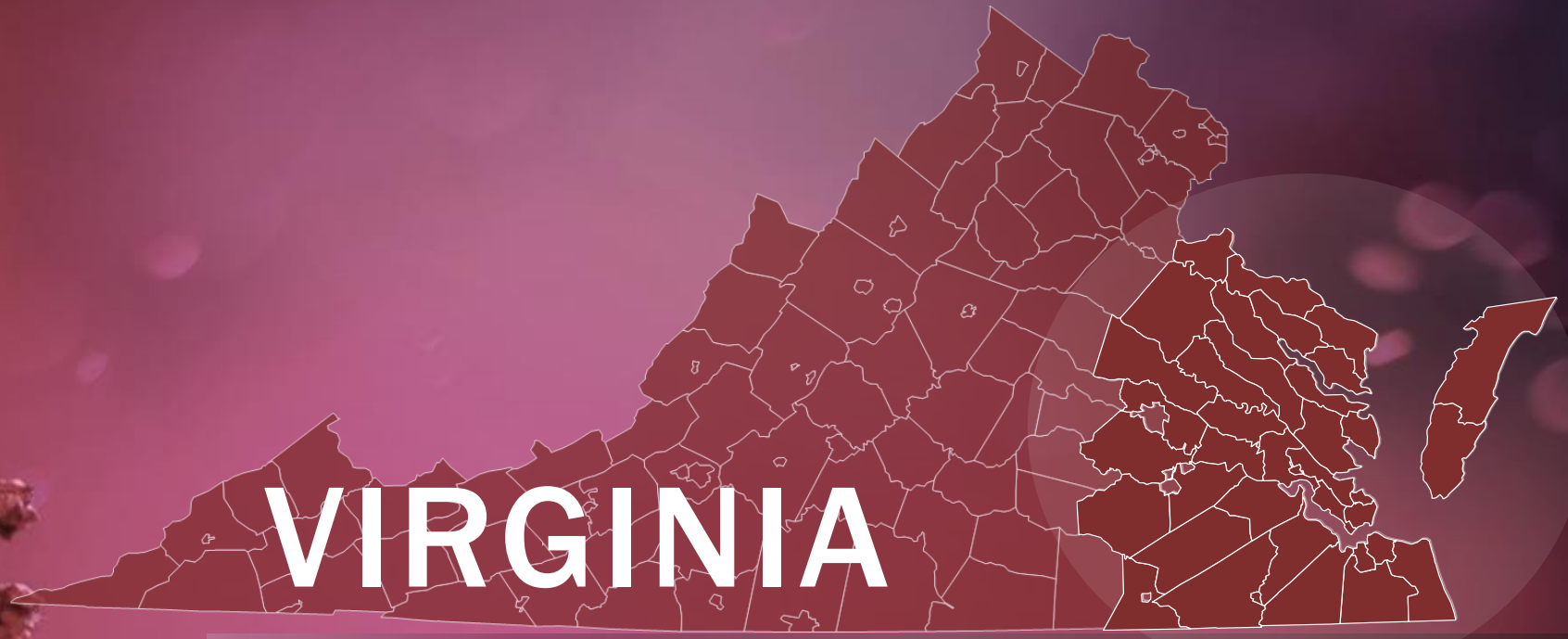




VIRGINIA

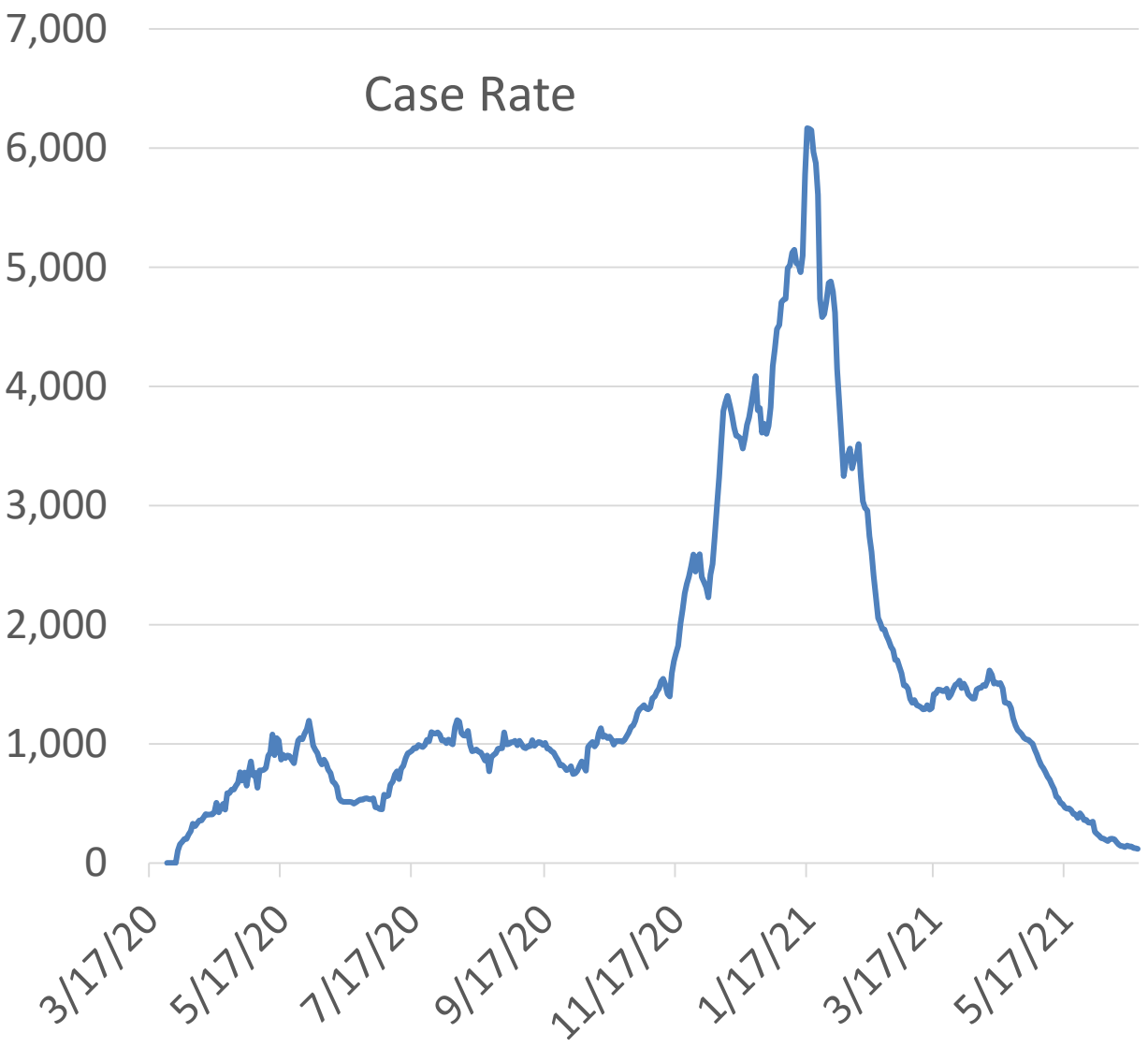
COVID-19 Update June 24th, 2021

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



Confirmed cases have declined from last week to 119 per day (-15%)

- This is 91 percent lower than the mid-March low of 2021 and 73 percent below the summer lows of 2020

COVID hospitalizations have decreased to 259 (-33%)

Vaccination is continuing to increase with at least 50 percent of the population fully vaccinated

- With the current trends, community immunity from vaccination will not be reached statewide before the fall

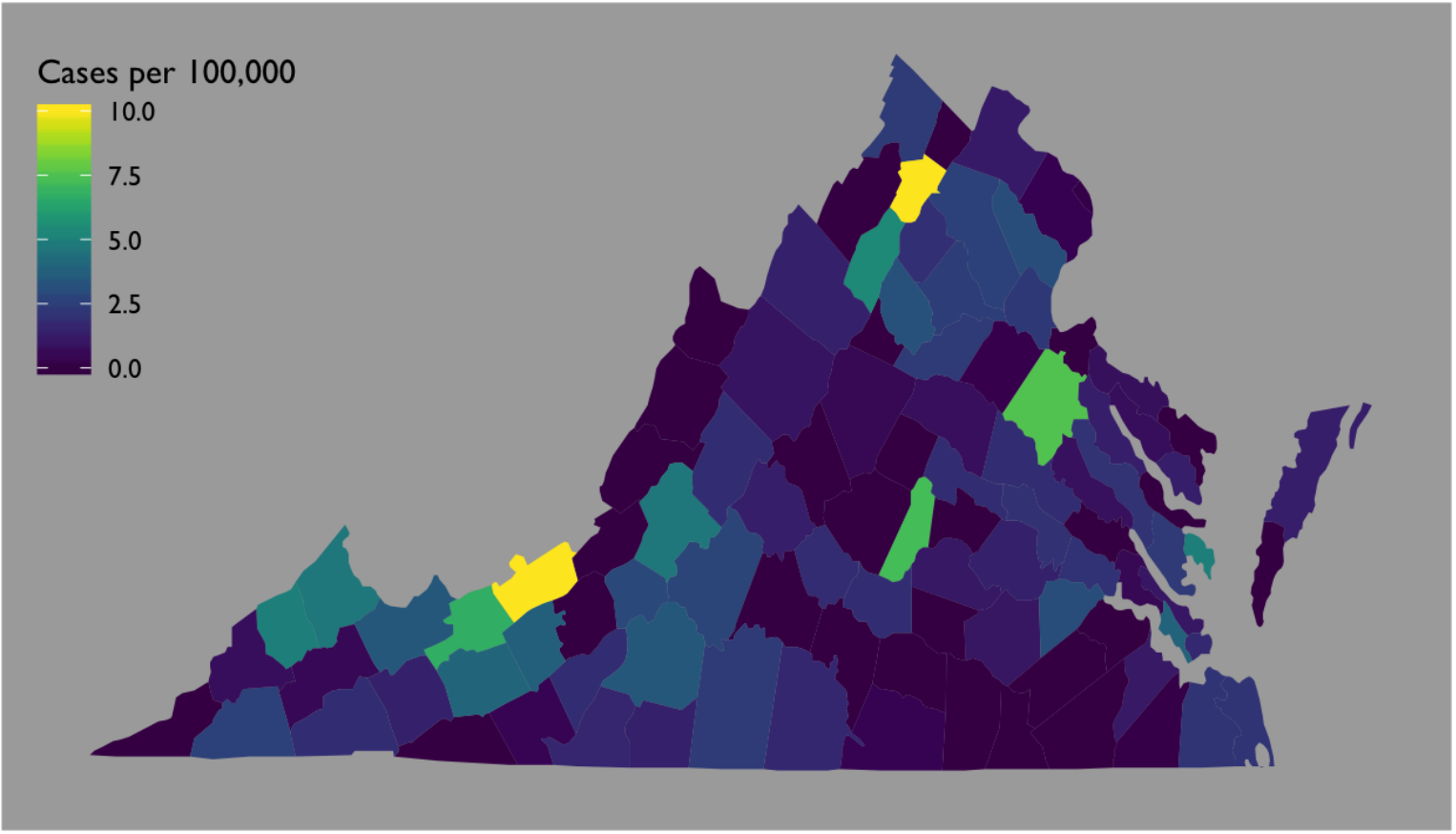
Case rates are below the lows of 2020, and the trend is for a sustained decline

- 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



These data were updated June 23rd and represent a seven-day average of the previous week

Yellow indicates at least 10 cases per 100,000

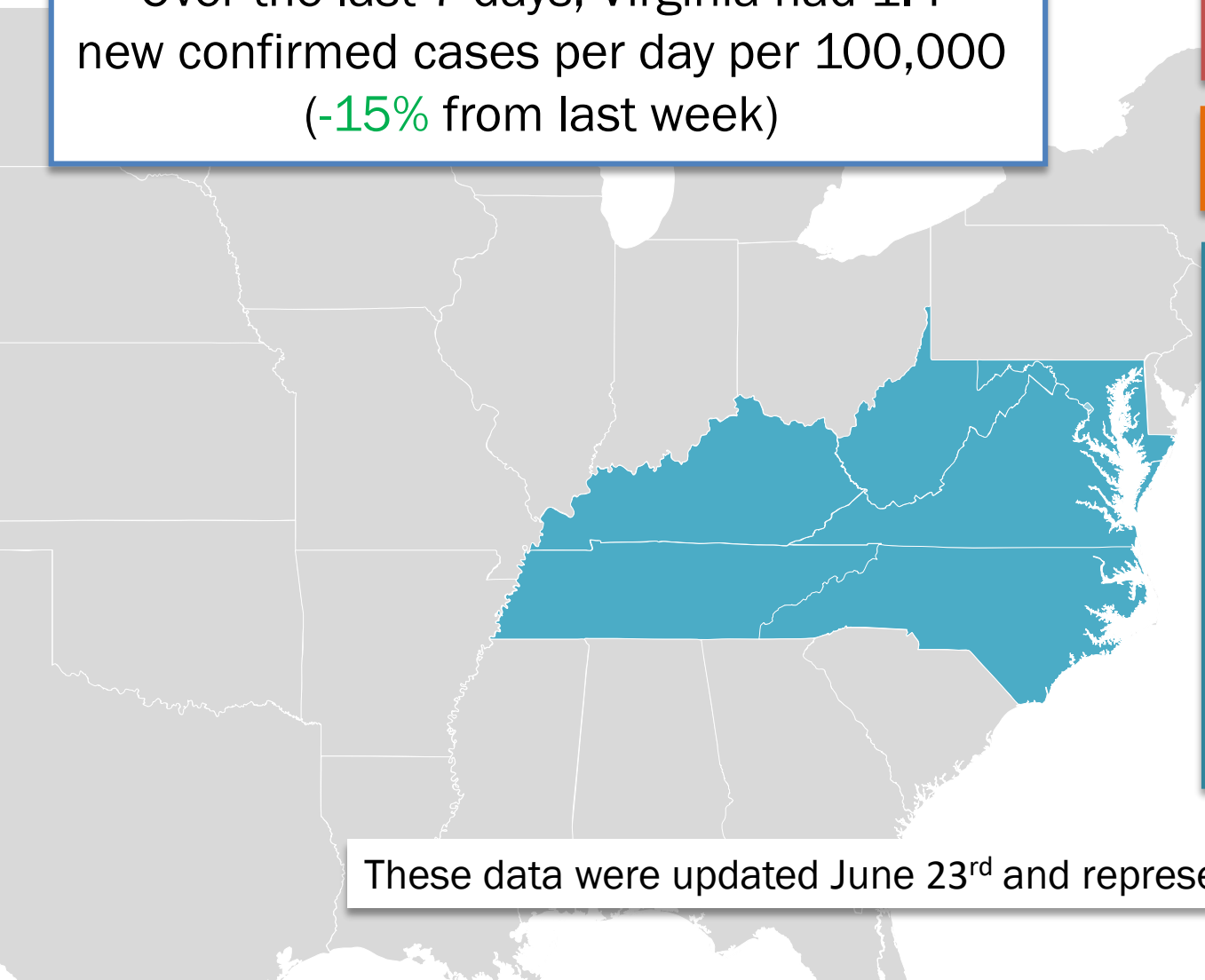
Case levels have drifted lower across the Commonwealth

- 2 percent of counties have more than 10 cases per 100,000 (57,000 Virginians live in these counties)
- 92 percent of counties have fewer than 5 cases per 100,000 (8,271,000 Virginians live in these counties)

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

Case levels for neighboring states remain low

Over the last 7 days, Virginia had 1.4 new confirmed cases per day per 100,000 (-15% from last week)



Very high case loads (>20):

High case loads (10-20):

Lower case loads (<10): None

- Kentucky (3.3 new cases per 100k, -43% from last week)
- West Virginia (2.4, -52%)
- North Carolina (1.8, -50%)
- District of Columbia (1.4, -7%)
- Tennessee (1.2, -53%)
- Maryland (1.0, -38%)

These data were updated June 23rd and represent a seven-day average of the previous week

50 percent of Virginians are fully vaccinated, and an additional 8 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	284,352	486,127	561,355	593,642	695,255	705,768	479,935	227,933	4,235,822
% Full	0.0%	25.9%	42.1%	47.9%	55.1%	61.7%	72.3%	78.2%	73.2%	49.6%
Partially Vaccinated	0	103,693	105,447	105,504	98,444	103,998	91,673	54,802	30,276	716,791
% with Partial	0.0%	9.4%	9.1%	9.0%	9.1%	9.2%	9.4%	8.9%	9.7%	8.4%
Confirmed Cases	32,768	74,491	130,888	110,487	99,140	96,993	65,921	35,334	25,019	679,137
% Confirmed Cases	3.3%	6.8%	11.3%	9.4%	9.2%	8.6%	6.7%	5.8%	8.0%	8.0%

*The total includes those without reported age information

Source: VDH, June 23rd

Vaccinations have slowed substantially from the peak

- Over the last seven days, Virginia has averaged 22,160 doses per day (-21% from last week and -71% from April)
- At this pace, the vaccination levels needed for community immunity will not be reached across the Commonwealth before September of 2021

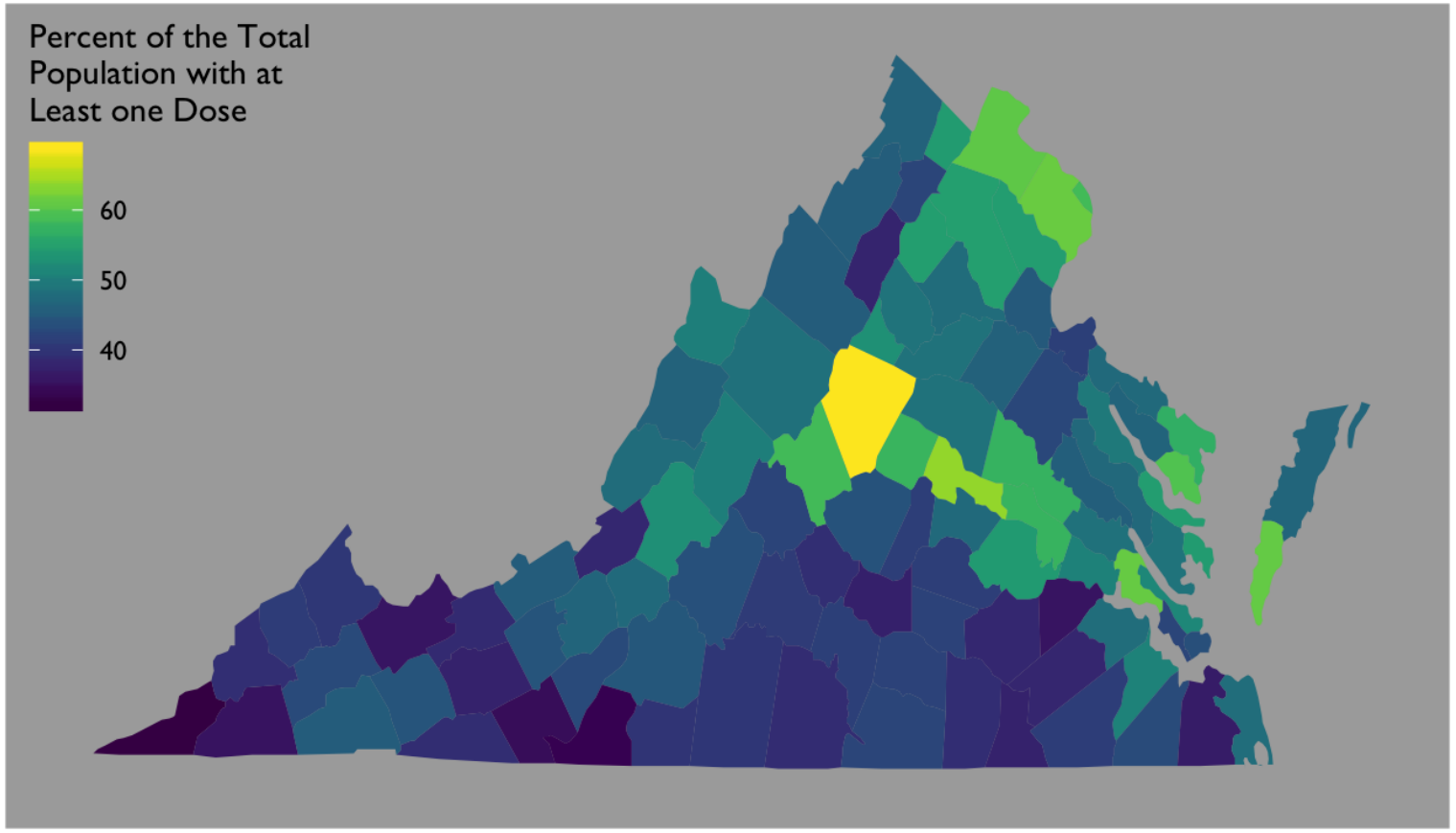
A Kaiser Family Foundation poll from May 28th indicated hesitancy has continued to decline

- 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

Vaccination rates are uneven across the Commonwealth

Share of the Total Population with at Least One Dose

Source: VDH



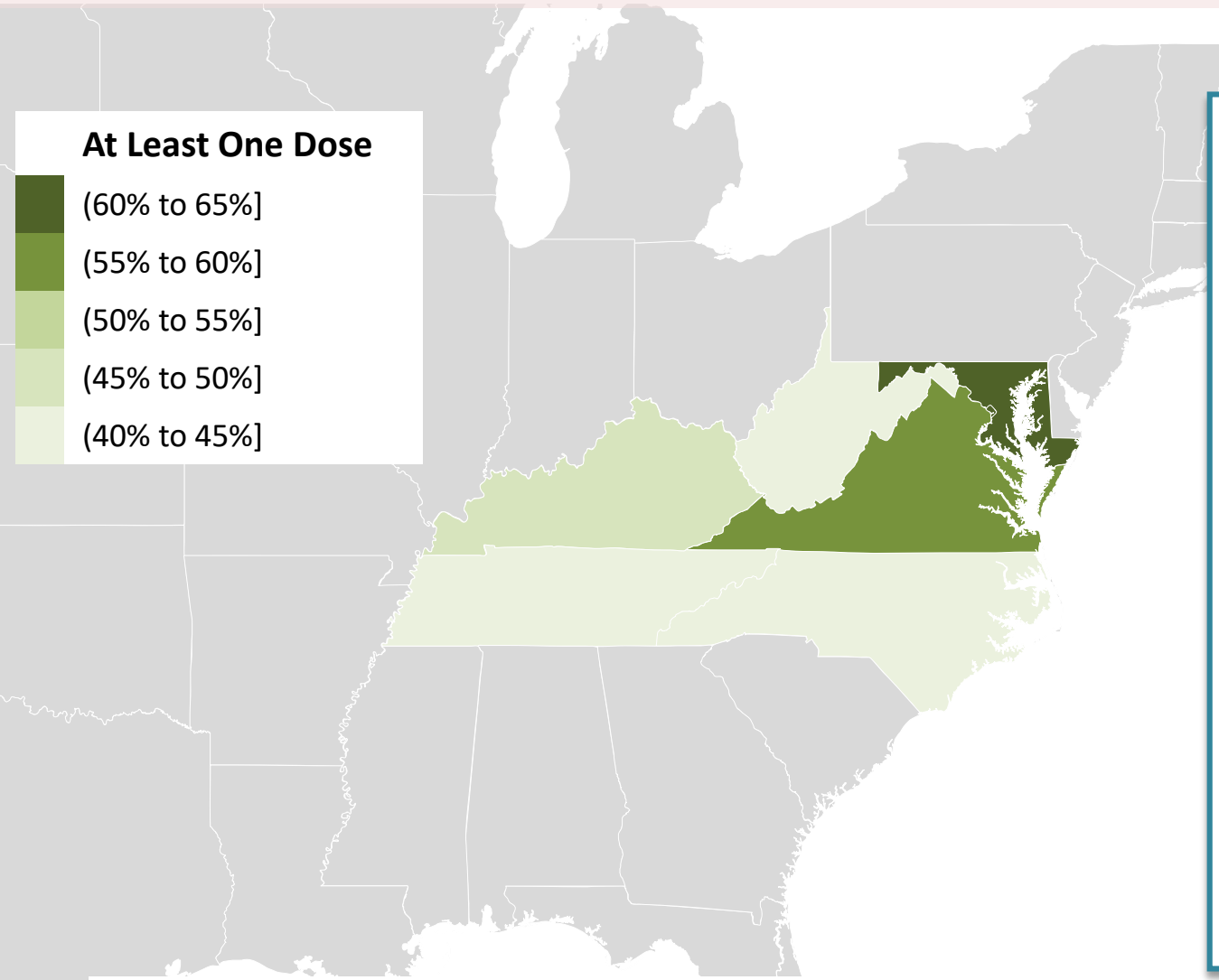
These data were updated June 23rd

The population with at least one dose varies by county

- 39 counties (4.2 million Virginians) have more than 50 percent of their total population vaccinated (up from 37 counties and 4.1 million Virginians)
- 25 counties (930,000 Virginians) have less than 40 percent of their total population vaccinated (down from 27 counties and 1.0 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

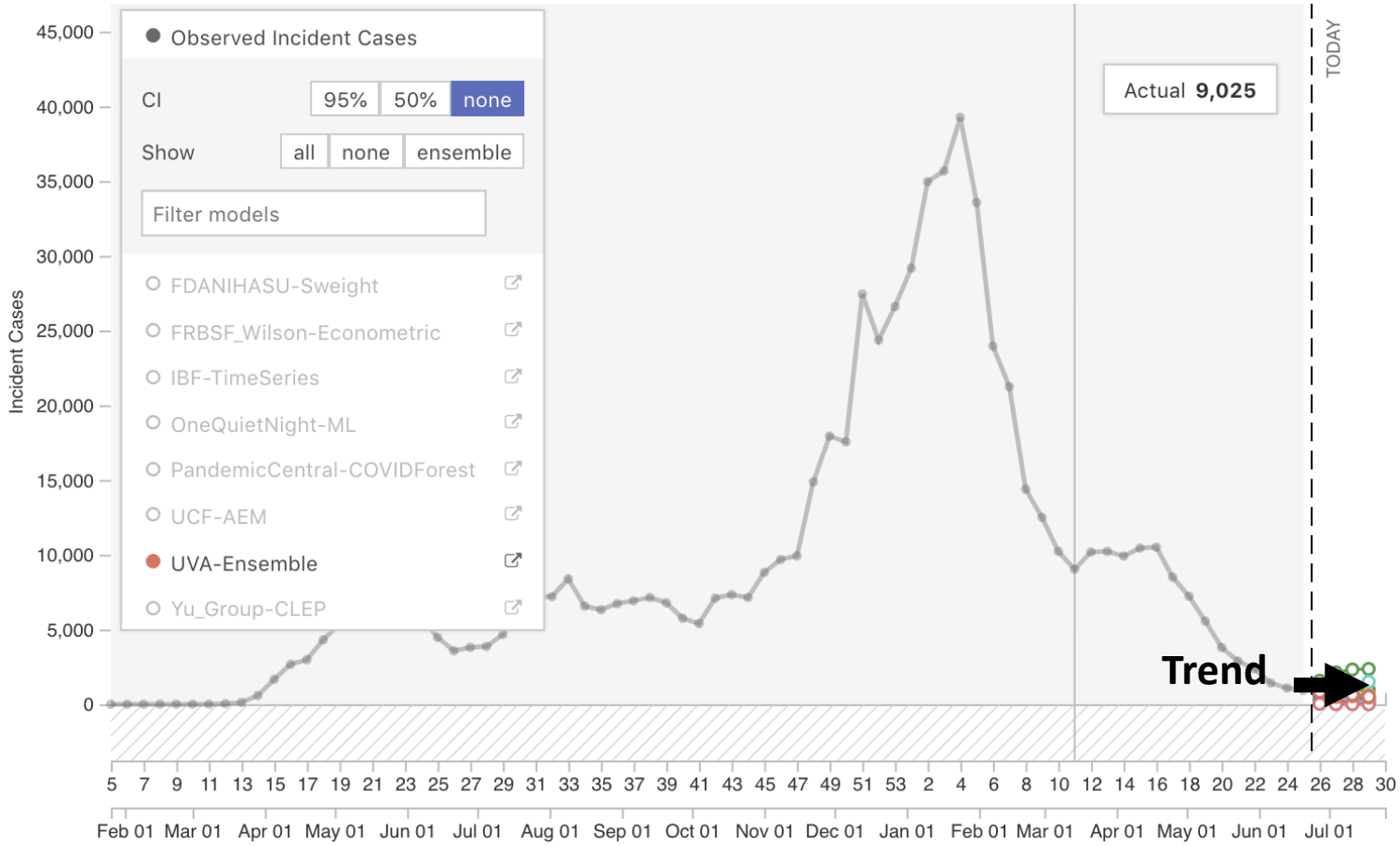


	Partially Vaccinated*	Fully Vaccinated*
Nationwide	**8.2%**	**45.3%**
D.C.	9.5%	50.8%
Kentucky	6.5%	42.3%
Maryland	6.6%	54.0%
North Carolina	6.0%	38.7%
Tennessee	6.4%	34.6%
Virginia**	**7.8%**	**50.5%**
West Virginia	6.3%	36.5%

* 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 23rd

The model forecasts broadly agree on a flattening



Source: COVID-19 Forecast Hub, https://viz.covid19forecasthub.org/
Accessed June 23rd

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

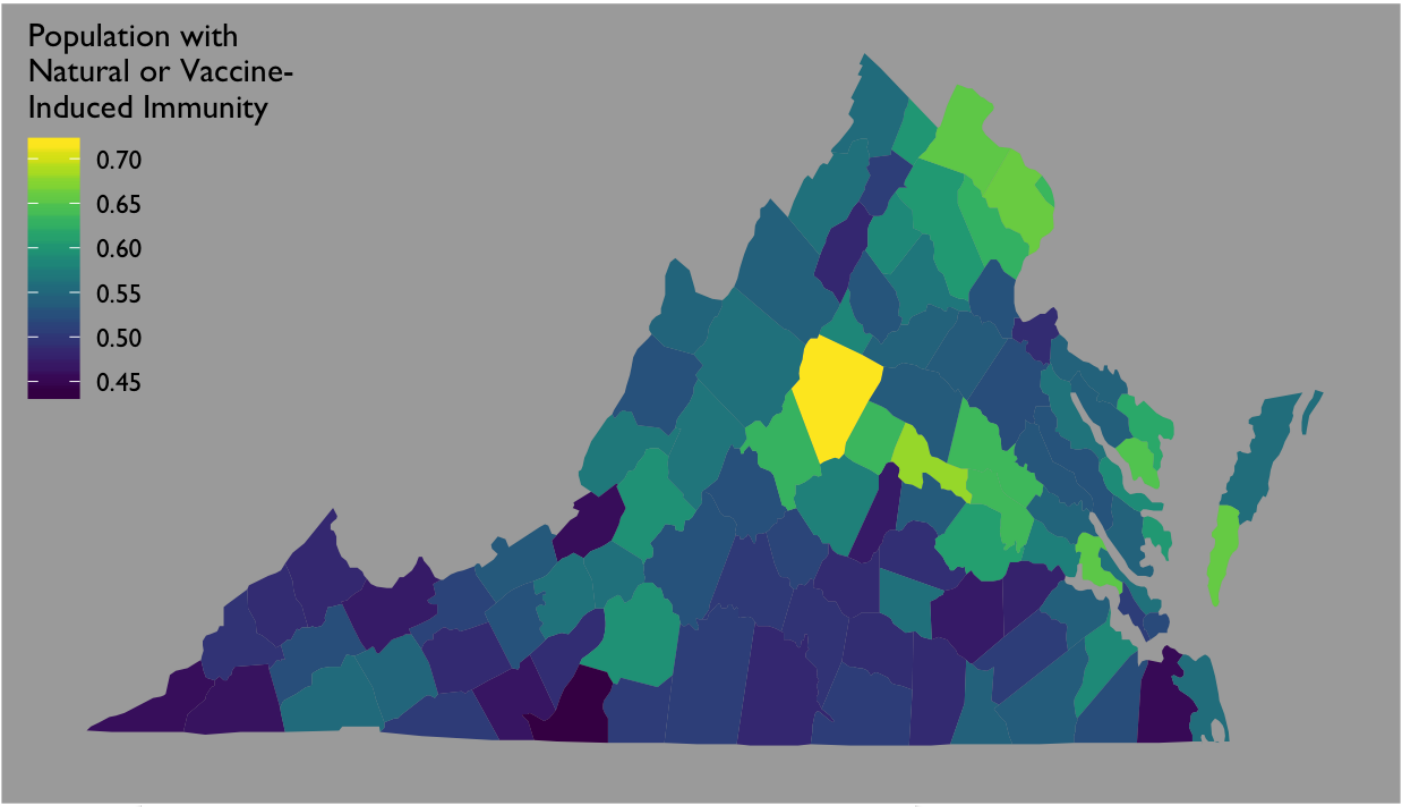
Modeling will be less useful for forecasts with the current decline in cases

- 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

Immunity can be gained by prior infection or vaccination

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

Source: VDH



These data were updated June 23rd

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 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 44 percent to 72 percent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