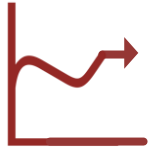# VIRGINIA

COVID-19 Update October 22nd, 2020

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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 work of the research team will be documented in a forthcoming RAND research report. 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

Virginia's total case level increased

- Counties in the southwest saw the largest increases

- Hospitalizations also continued to rise

- Testing levels remain near recent highs

Additional triggers could lead to a rapid rise in the coming months

- Seasonal changes
- Holiday interactions

Cheaper, faster testing or a vaccine could reduce the spread if widely deployed
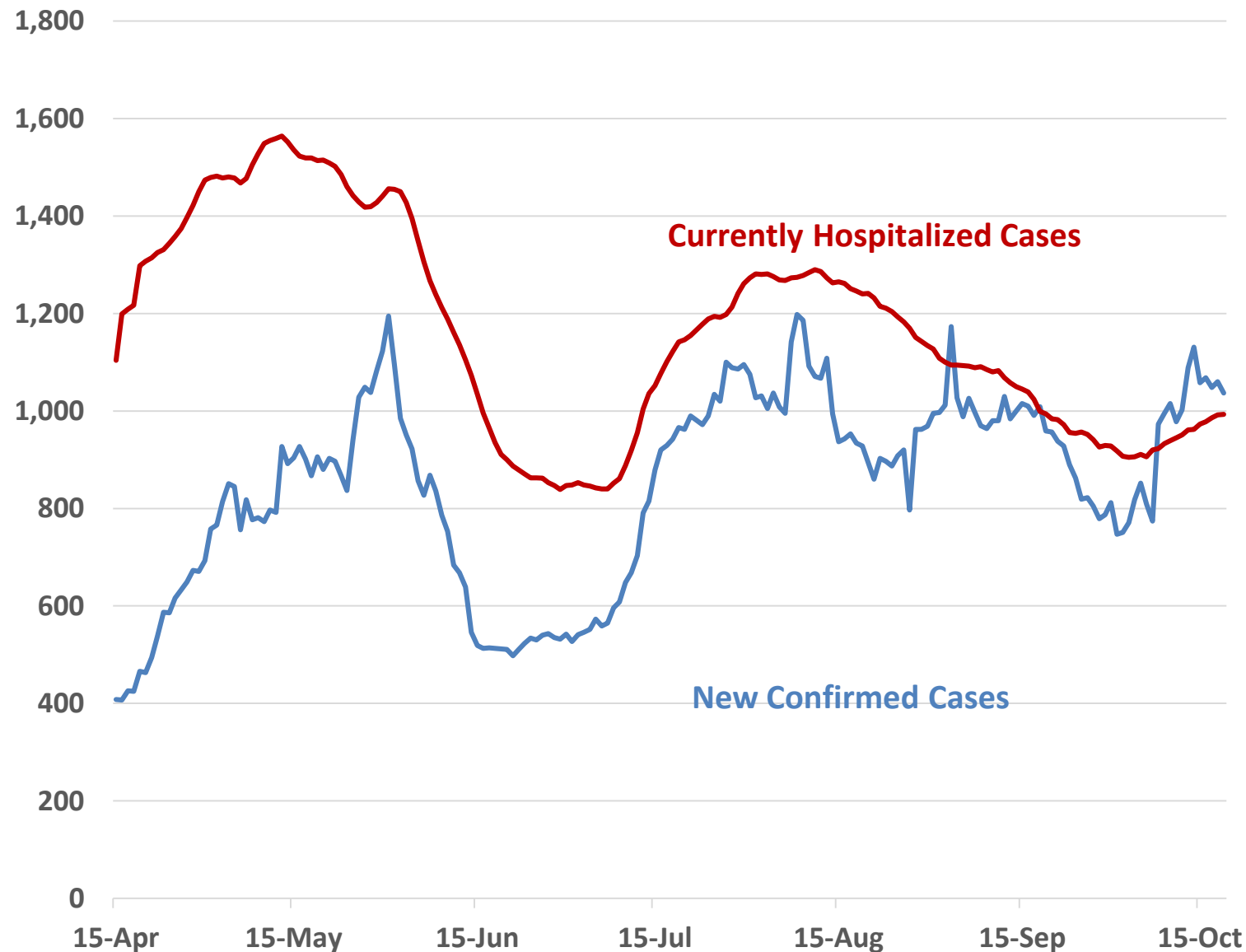
Modeling is less useful for forecasting because behavioral responses are driving current trends

- Models will continue to be very useful for comparing policies and exploring scenarios

Changes in testing practices may change data quality in ways that make it difficult to produce consistent data series
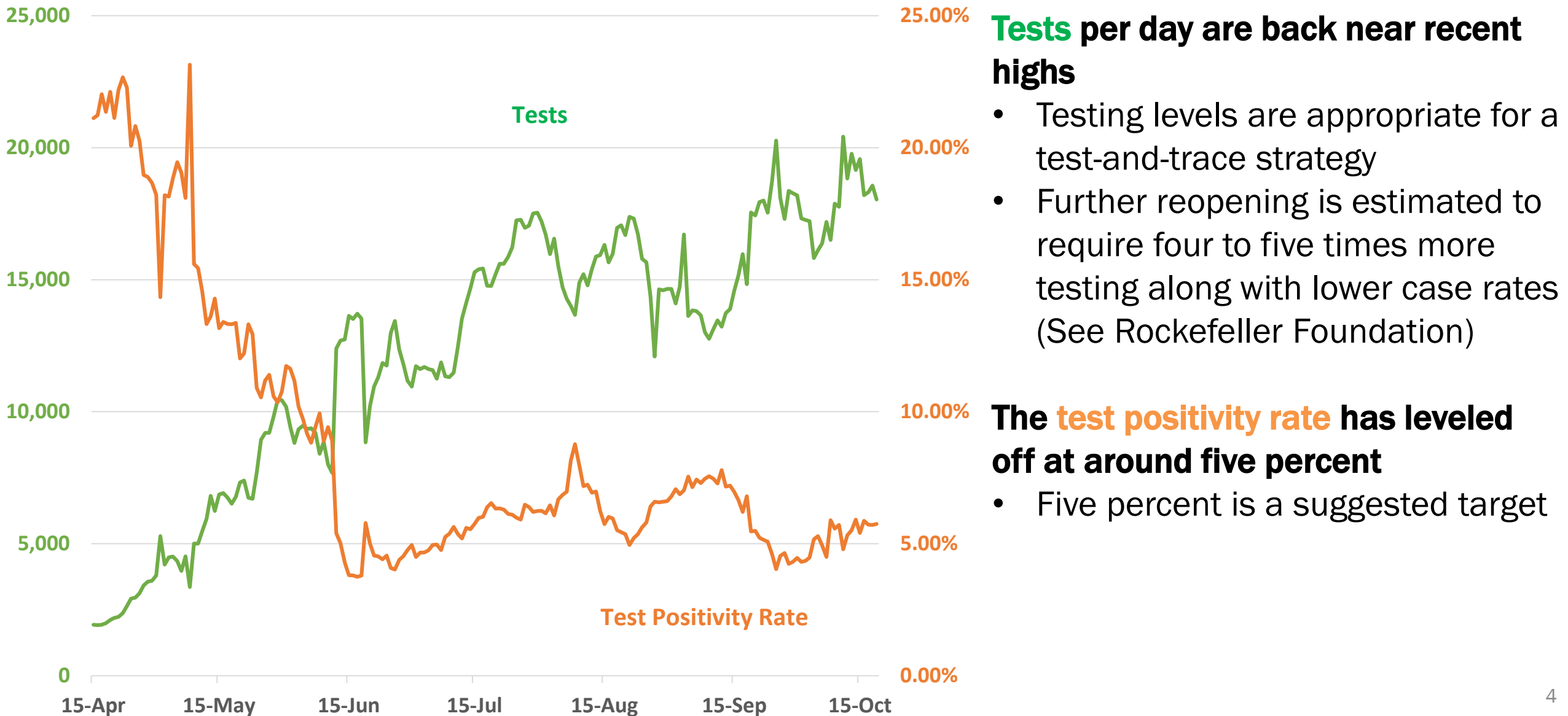
Cases and hospitalizations rose last week

New confirmed cases rose slightly and have been over 1,000/day on average for more than a week
- The level is back in the 900 to 1,100 cases/day range

Currently hospitalized cases have increased
- This is a lagging indicator and so there may be a continued reversal from the recent declines

Testing levels are at the target range for a test-and-trace strategy

Tests per day are back near recent highs

- Testing levels are appropriate for a test-and-trace strategy
- Further reopening is estimated to require four to five times more testing along with lower case rates (See Rockefeller Foundation)

The test positivity rate has leveled off at around five percent
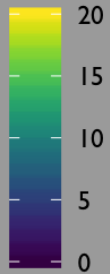
- Five percent is a suggested target

4

Case rates are slightly higher across most of the Commonwealth

CASE COUNT
Source: VDH

==Yellow== **indicates at least 20 cases per 100,000**

Virginia's southern counties continue to see high case levels

Counties in the Southwest saw the largest increases compared to last week

Cases per 100,000
20
15
10
5
0

These data were updated October 20th and represent a seven-day average of the previous week

Case rates in most neighboring states have continued to rise

Over the last 7 days, Virginia had 12.4 (+8% from last week) new confirmed cases per day per 100,000

Very high case loads:
- Tennessee (29.7 new cases per 100k, +3% from last week)
- Kentucky (23.4, -4%)

High case loads:
- North Carolina (19.8, +4%)
- West Virginia (15.6, +30%)
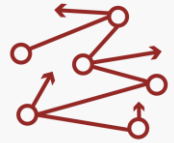- Maryland (10.2, +6%)

Lower case loads:
- District of Columbia (7.8, -17%)

These data were updated October 20th and represent a seven-day average of the previous week

We've been monitoring recent, relevant literature

Begun and Jiang survey six examples of "complexity science" (related to operations research or systems engineering) being applied by health care institutions to adjust for COVID-19

- Several hospital systems leveraged IT systems to allow for telehealth in a work-from-home environment
- Others relied on internal and external expertise to rapidly respond to changing demand patterns
- These examples may serve as inspiration to hospital leadership as the pandemic continues

Rossen et al. estimated the excess death rate from January 26th to October 3rd using five years of death data

- In this timeframe, there were 299,028 excess deaths in the United States
- In a separate study covering March to August, Woolf et al. found that about 67 percent of excess deaths were due to COVID-19 (52% for Virginia), and Alzheimer's, heart disease, diabetes and a few other conditions accounted for much of the remaining growth
- Analysis should be conducted to identify interventions to reduce the non-COVID-19 excess deaths

Lynch and Gore tested different statistical approaches for short-term forecasts of Virginia's case levels

- Using county and independent city level data on case levels in Virginia, they looked for the best prediction approach for case loads a week in advance
- They found that a three-day moving average had the lowest mean absolute error for most of the geographic comparisons
- For short-term planning purposes, using the average for the last few days will be an easy and relatively accurate approach to estimating case loads for the next few days

There have been two waves but for different parts of the state
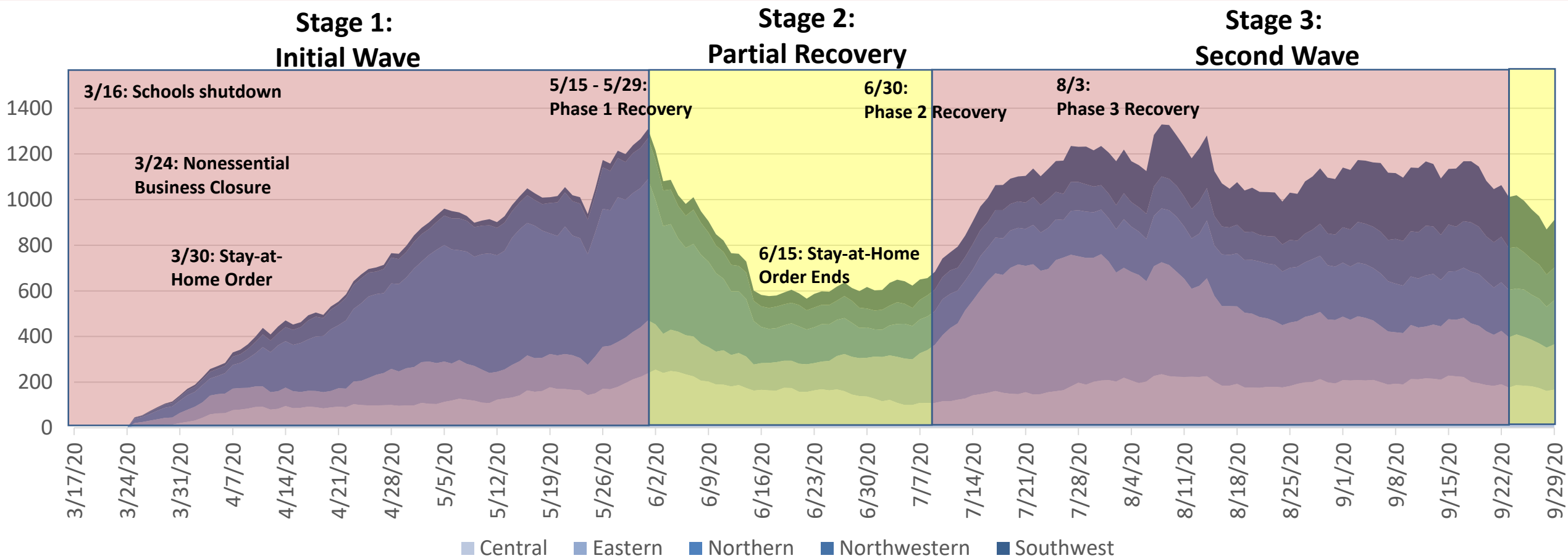
Stage 1: Initial Wave
- Too little testing to know the true case load
- Cases mostly in the Northern Region

Stage 2: Partial Recovery
- Cases fell for the first half of June
- Cases flattened after stay-at-home order ended

Stage 3: Second Wave
- Cases spiked in July in the Eastern Region
- By August, case loads had grown substantially across Southwest Region
- In late-August/September, case rates grew across the state

8

Forecasts of cases are diverging, but average to a leveling off
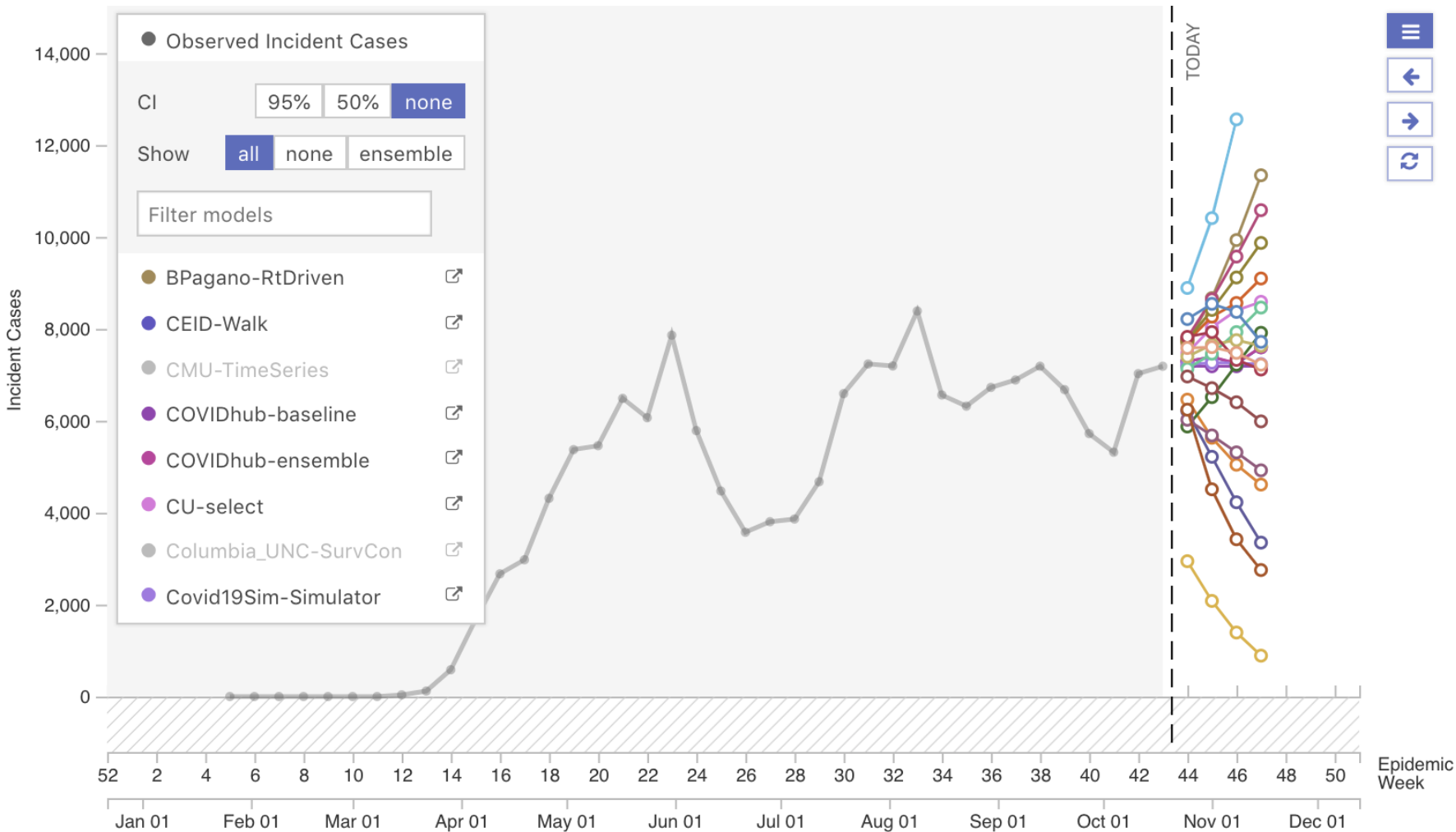
There is substantial variation in the model forecasts for cases

- The "average" model is predicting a leveling off at the current case level

The mechanisms driving the spread at this stage are very different than in the early stage

- Initially, people were not taking precautions or changing their behavior, so COVID spread exponentially
- Changing patterns of spread have required models to evolve

For short-term forecasts, assuming last week's level is a good estimate

Source: COVID-19 Forecast Hub, https://viz.covid19forecasthub.org/ Accessed October 20th

There are several triggers that could lead to increased spread

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Seasonality	Small Increase	Medium Increase	Large Increase	Large Increase	Large Increase	Medium Increase	Small Increase		Small Decrease	Large Decrease	Large Decrease	Small Decrease
Holiday Travel		Medium Increase	Large Increase	Small Increase						Small Increase	Small Increase	
Vaccine				Small Decrease	Small Decrease	Small Decrease	Small Decrease	Small Decrease	Small Decrease	Large Decrease	Large Decrease	Large Decrease

Legend:
- Large Increase
- Medium Increase
- Small Increase
- Little Change
- Small Decrease
- Medium Decrease
- Large Decrease

There will likely be several factors that could increase the spread in the next few months
- Seasonal effects for COVID-19 could lead to more spread during the colder months
- Holiday travel could lead to increased spread, particularly from the mixing of age cohorts

A vaccine may become available around the turn of the year
- It is unlikely that there will be sufficient supply initially to significantly reduce the spread
- The vaccine will not be completely effective and so a large share of the population will need to be inoculated
- People may scale back preventative behaviors (such as distancing and mask wearing) too soon

There are likely to be long-term repercussions that need planning and preparation to mitigate
- Mental health problems may persist particularly among medical professionals and those directly affected
- Following the 1918 pandemic, there were higher rates of disability, mental illness, and other conditions

Discussion and Questions