MODELING UPDATE

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BIOCOMPLEXITY INSTITUTE

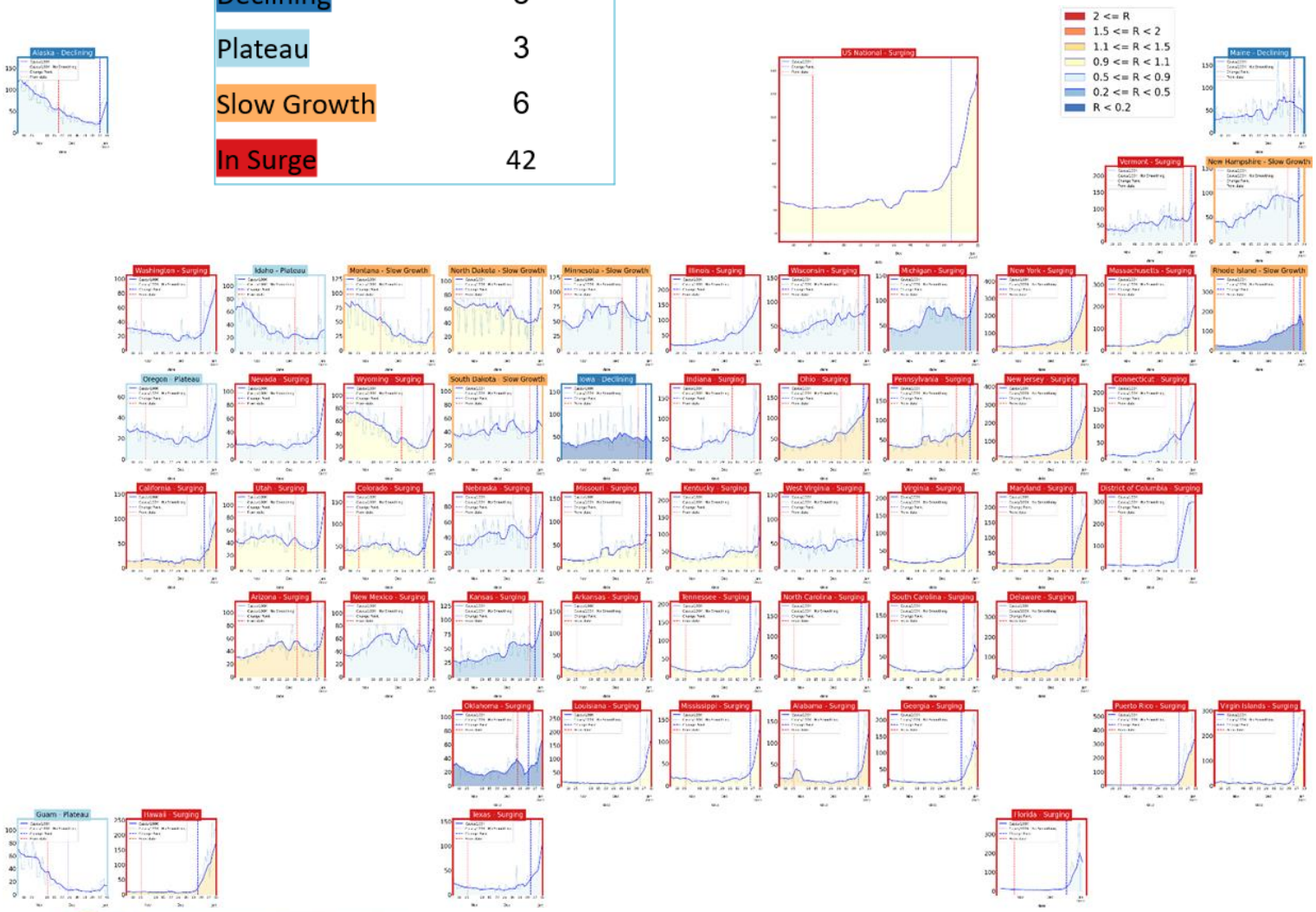
VDH VIRGINIA DEPARTMENT OF HEALTH
To protect the health and promote the well-being of all people in Virginia.

UVA COVID-19 Model-Background

- Model is developed by the UVA Biocomplexity Institute
- Model continues to evolve
  - Parameterized at the locality level
  - Includes immunity (natural and vaccine) and waning immunity estimates
  - Projects vaccine & booster uptake
- Models thrive on more & better data, and the model improves every week.
- Variants, vaccinations, behavioral and policy responses drive changes in current trends

National Trajectories

Status	# States
Declining	3
Plateau	3
Slow Growth	6
In Surge	42



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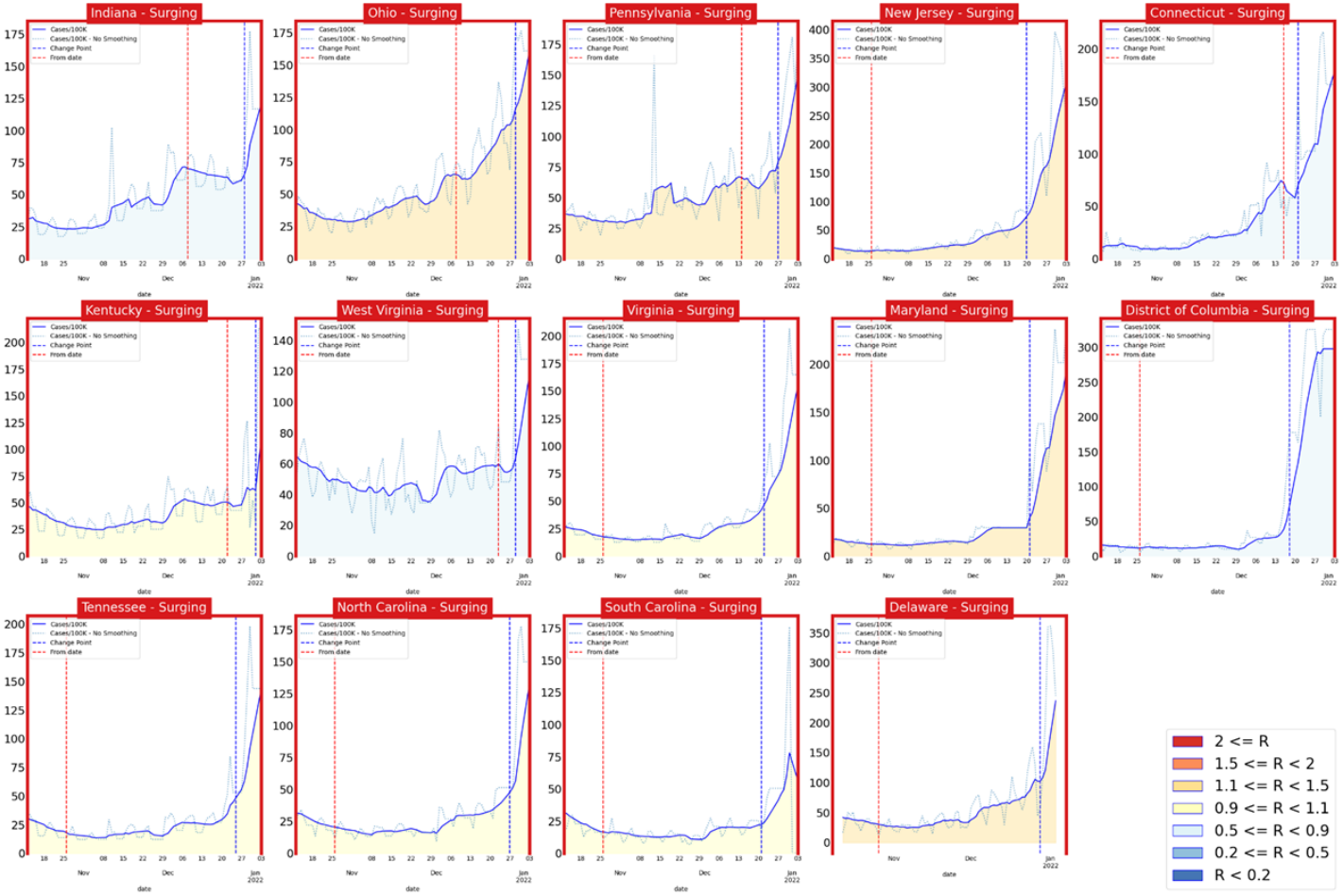
Virginia & Neighbors



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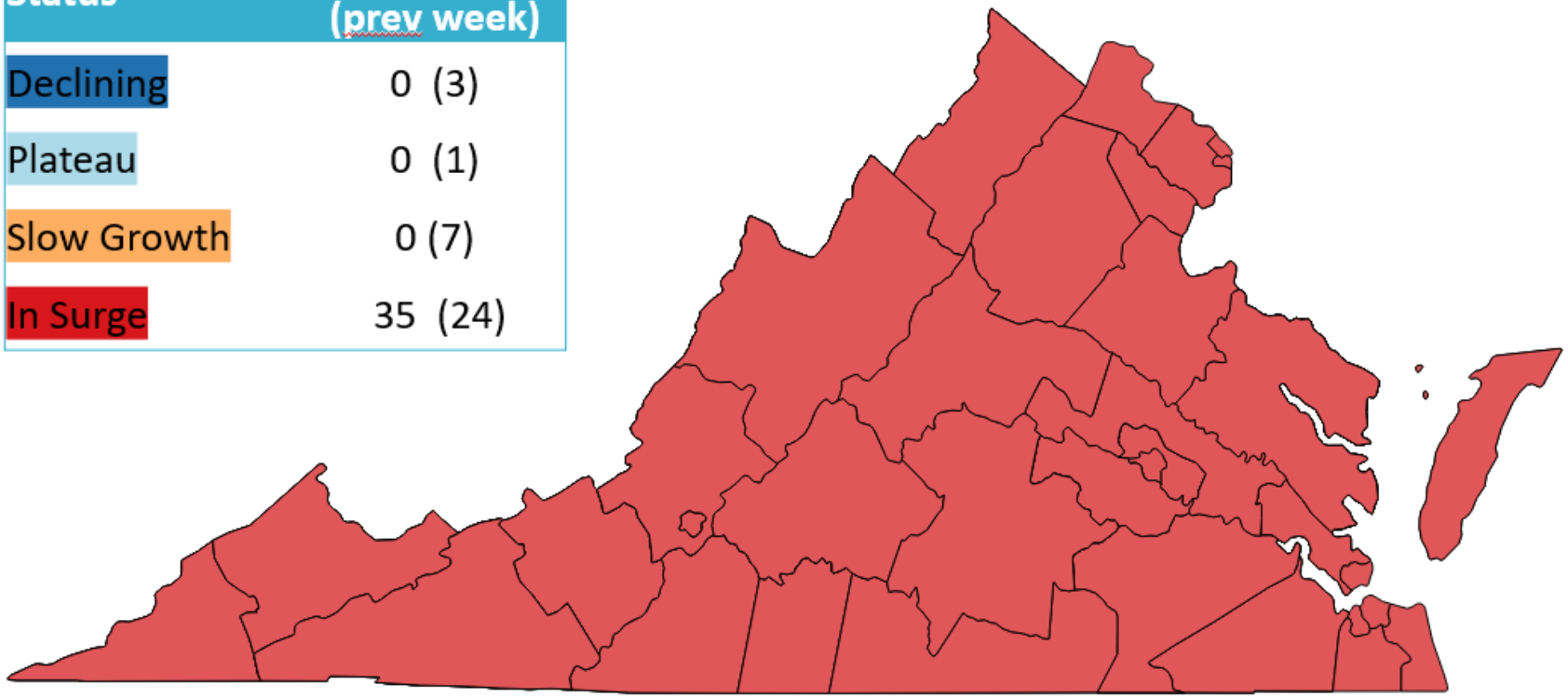
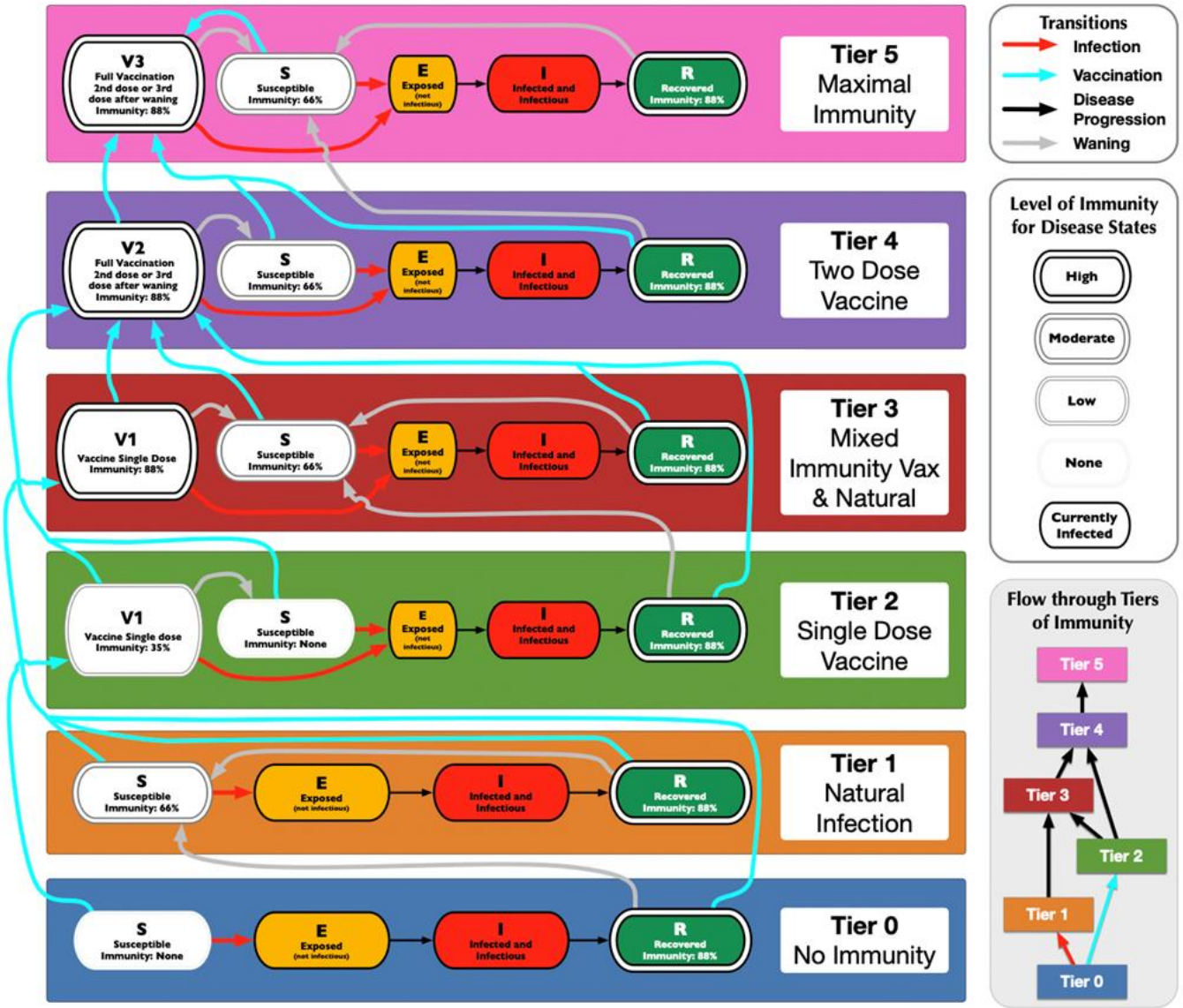
Health Districts in Surge

Status	# Districts (prev week)
Declining	0 (3)
Plateau	0 (1)
Slow Growth	0 (7)
In Surge	35 (24)



Immunity & Waning

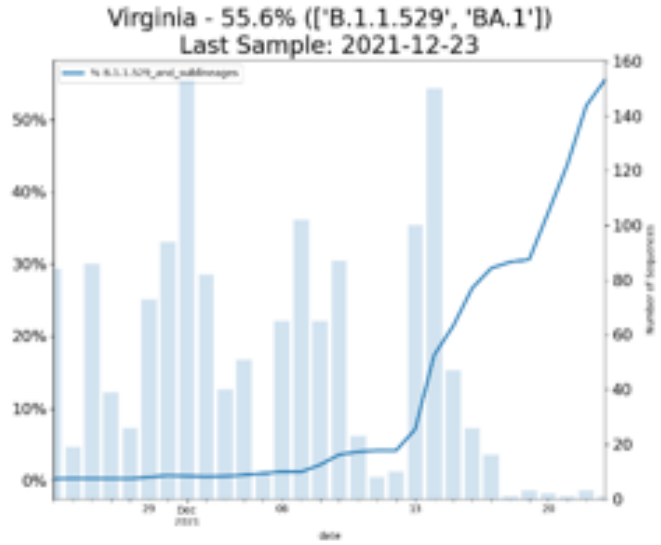


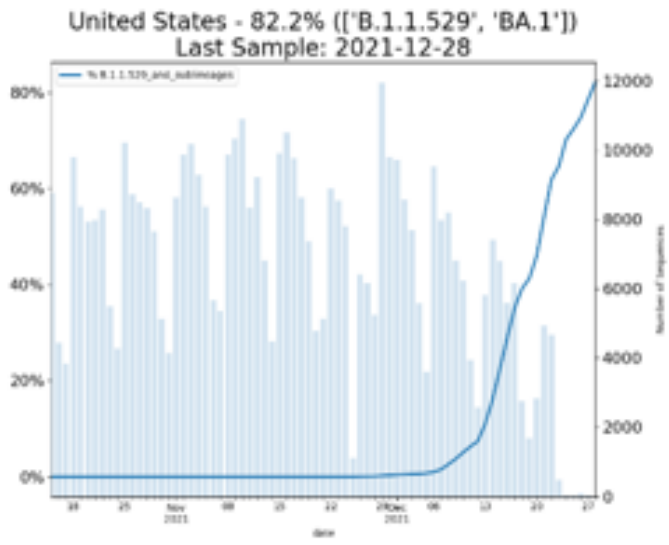
Scenarios

Name	Txm Controls	Description
Adaptive-Delta	Cur	Likely trajectory based on conditions remaining similar to the current experience
Adaptive-Omicron	Cur	Assumes rapid dominance of immune evading variant. Conservatively uses no transmission advantage to Delta but 30% of previously immune individuals are susceptible to infection from Omicron
Adaptive-Omicron-SurgeControl	- 25%	Transmission rates in the next month reduced through increased control from non-pharmaceutical interventions, with status quo vax and Delta
Adaptive-Omicron-FallWinter	FallWinter	Transmission rates coarsely follow the rates from last September through this February but are boosted by Delta's enhanced transmissibility

Variants

Omicron o - Lineage B.1.1.529



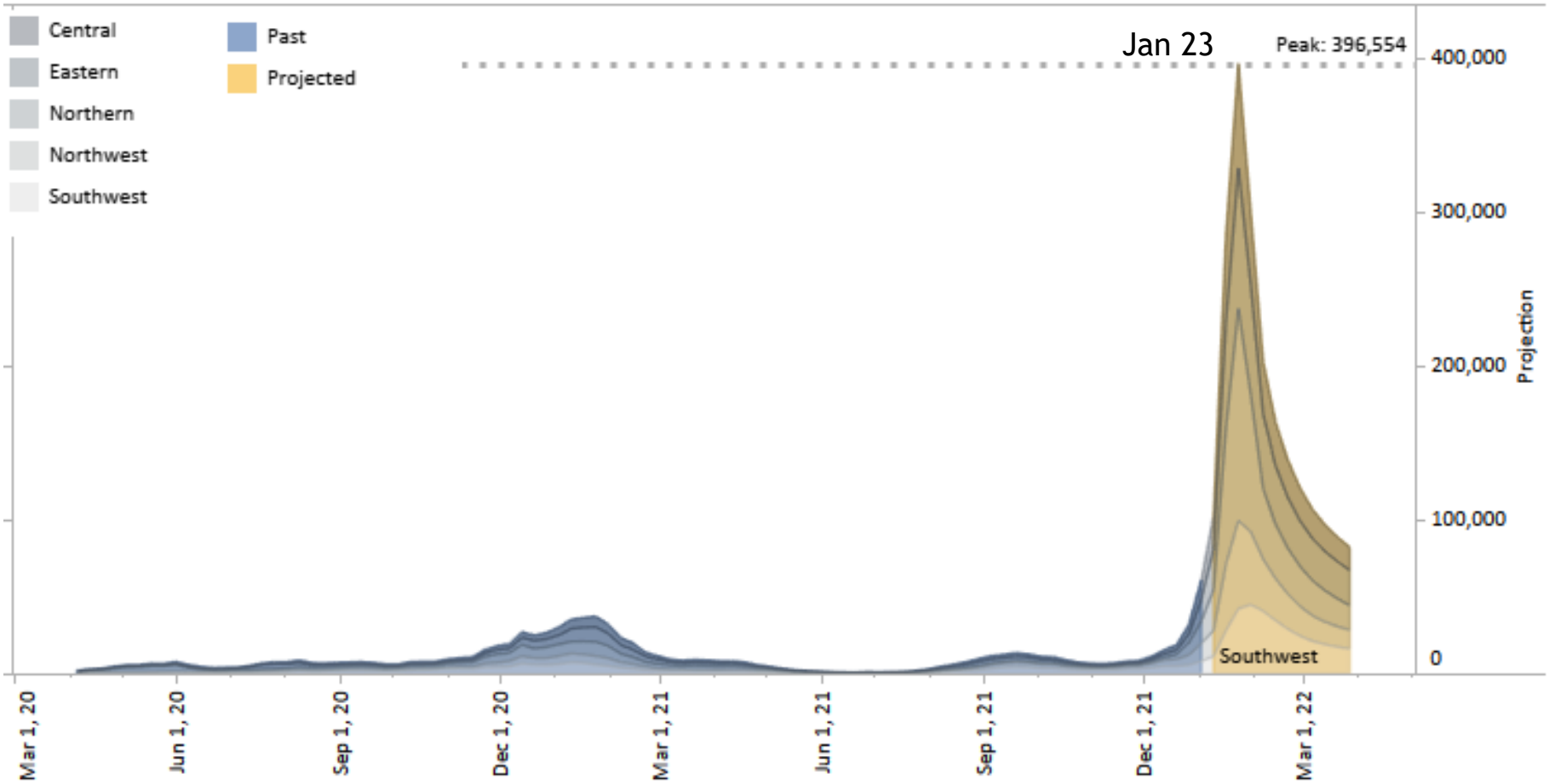


Omicron Scenario

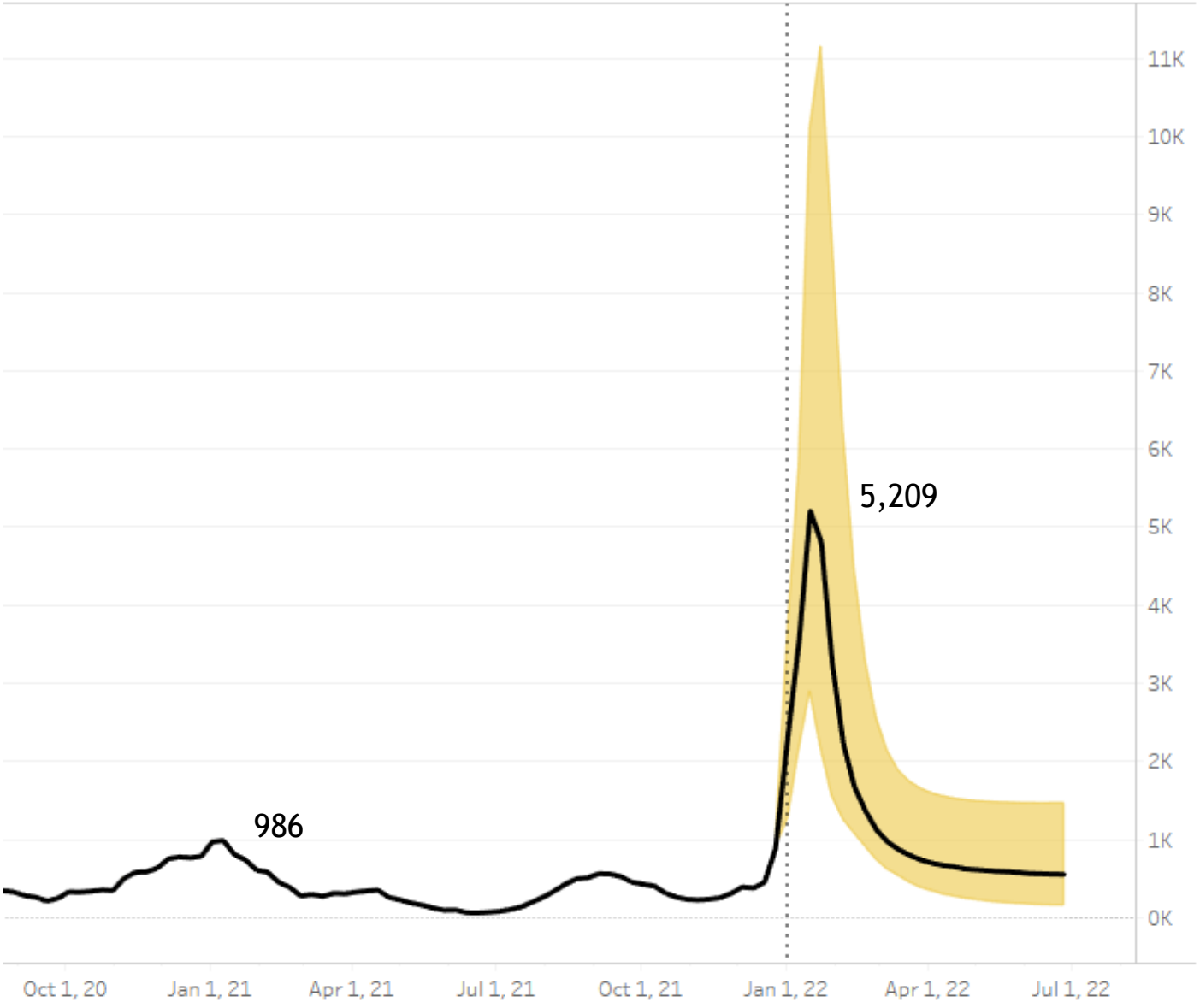
Omicron shown ability to evade immunity and may be more transmissible

- **Transmissibility**: New evidence suggests that Omicron has **similar transmissibility** to Delta
- **Immune Evasion**: Strong evidence demonstrates that Omicron can cause infection in those with some immunity (natural and vaccine induced). Consensus estimate of **80% immune evasion** allows Omicron to infect 80% of individuals that would have otherwise been protected against Delta
- **Prevalence**: Proportion of cases caused by Omicron variant estimated from growth rates observed in other countries with similar levels of immunity (growth of 32%, doubling in ~3 days)
- **Severity:** Several reports suggest Omicron may not cause as severe disease as Delta, we use a 50% reduction in severity for hospitalizations and deaths
- Studies: South Africa, UK, Canada

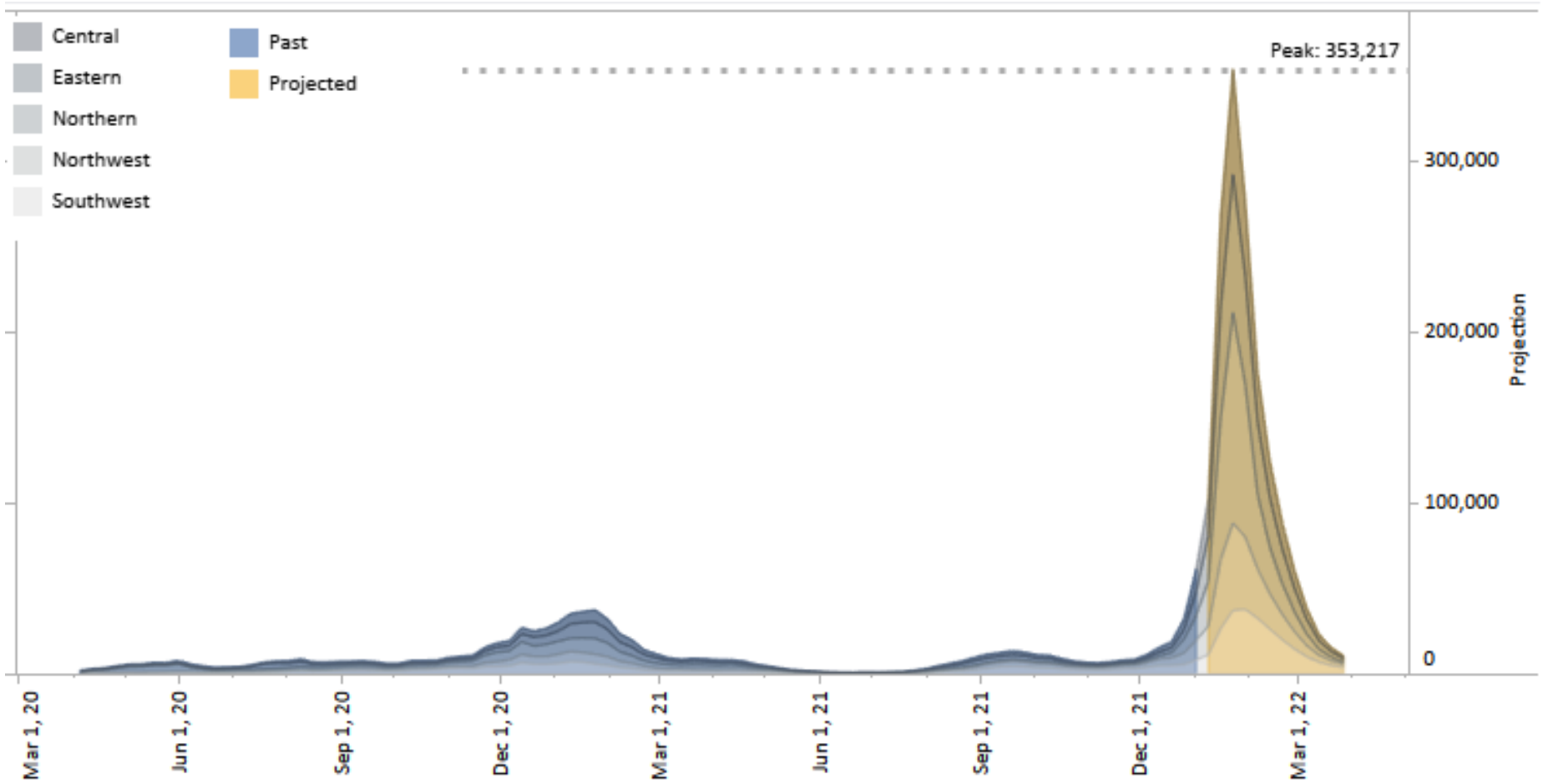
Weekly Case Projections: Omicron



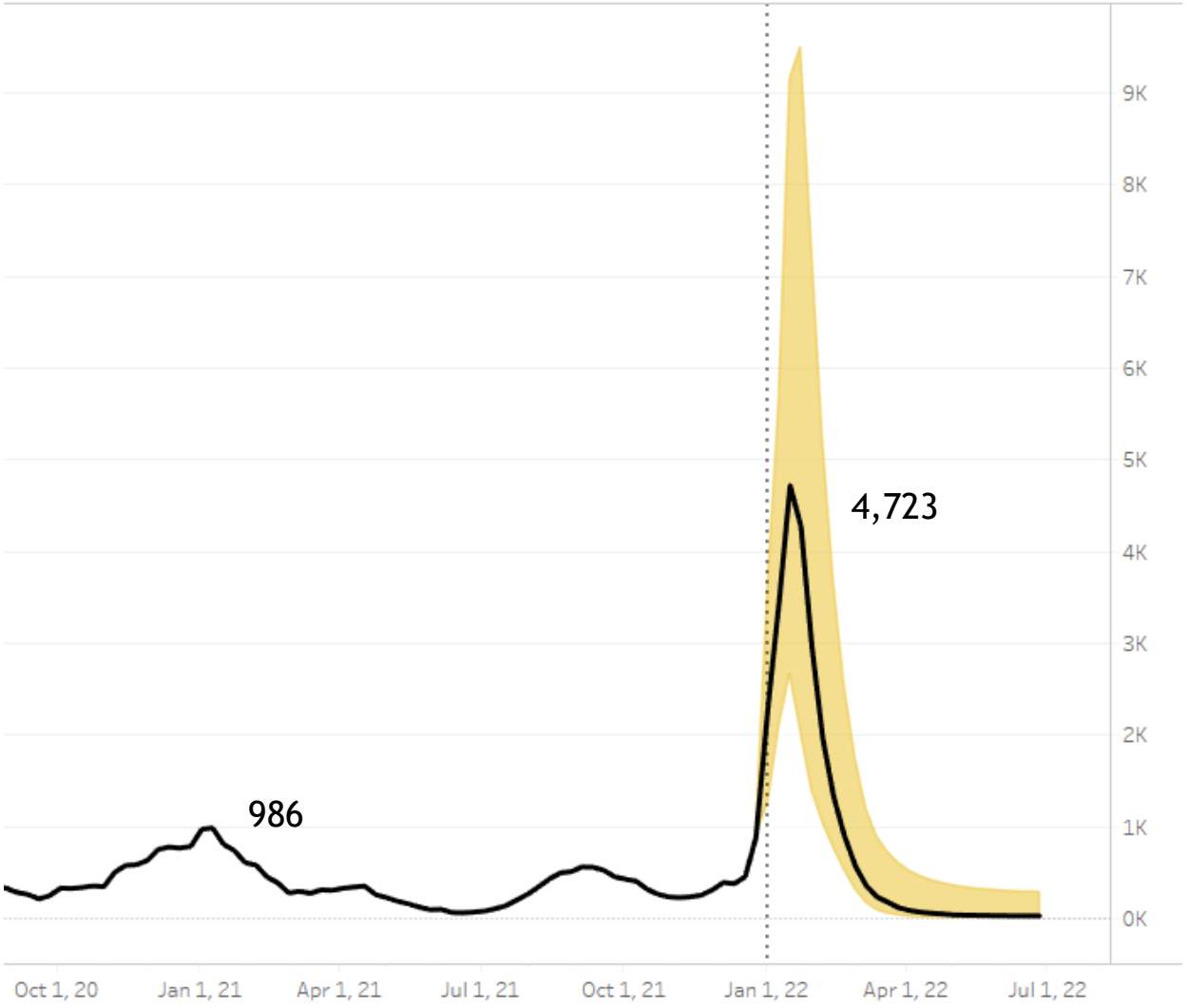
Weekly Hospitalization Projections: Omicron



Weekly Case Projections: Omicron – Fall/Winter

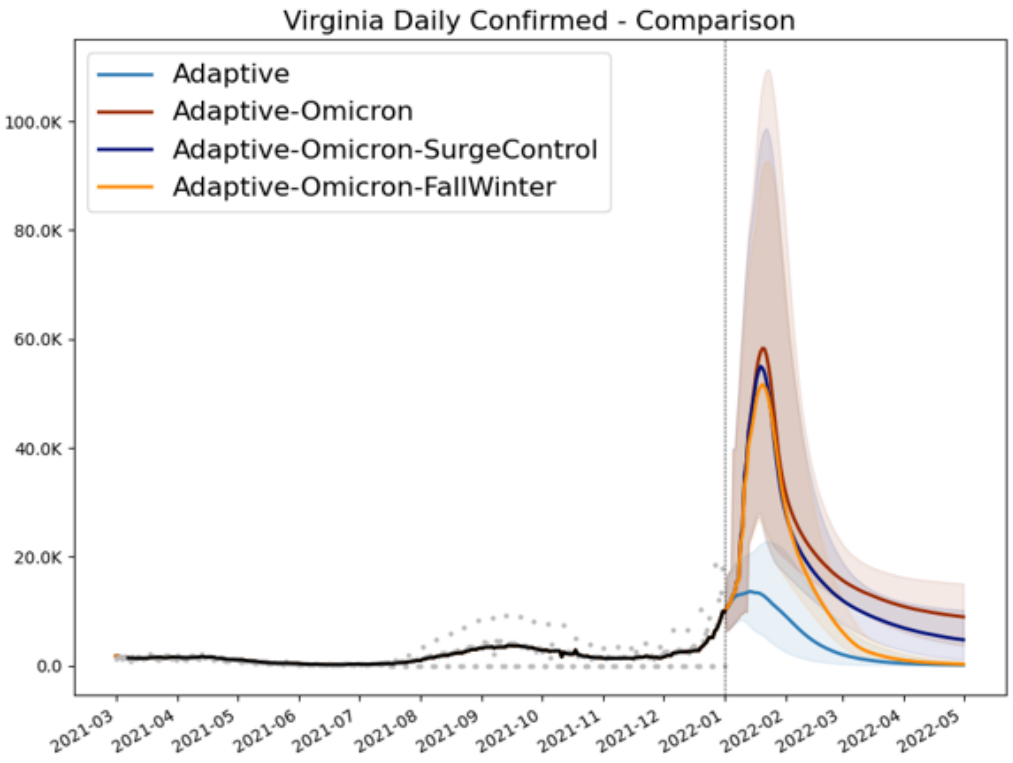


Weekly Hospitalization Projections: Omicron – Fall/Winter

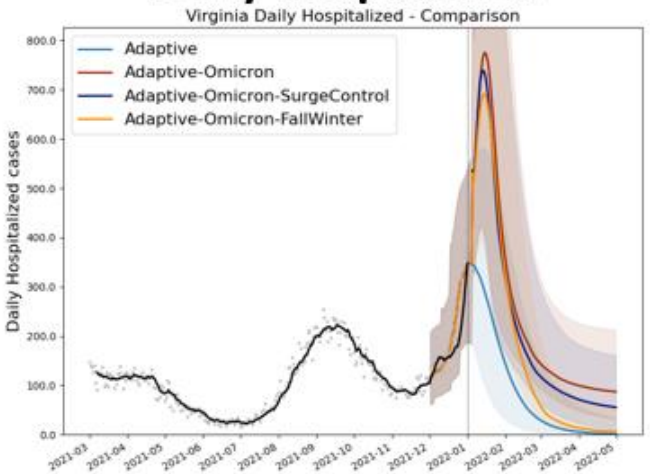


Projections

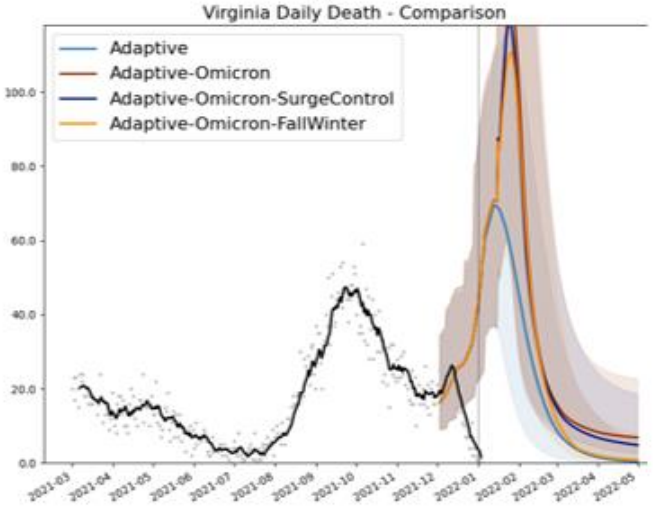
Confirmed cases



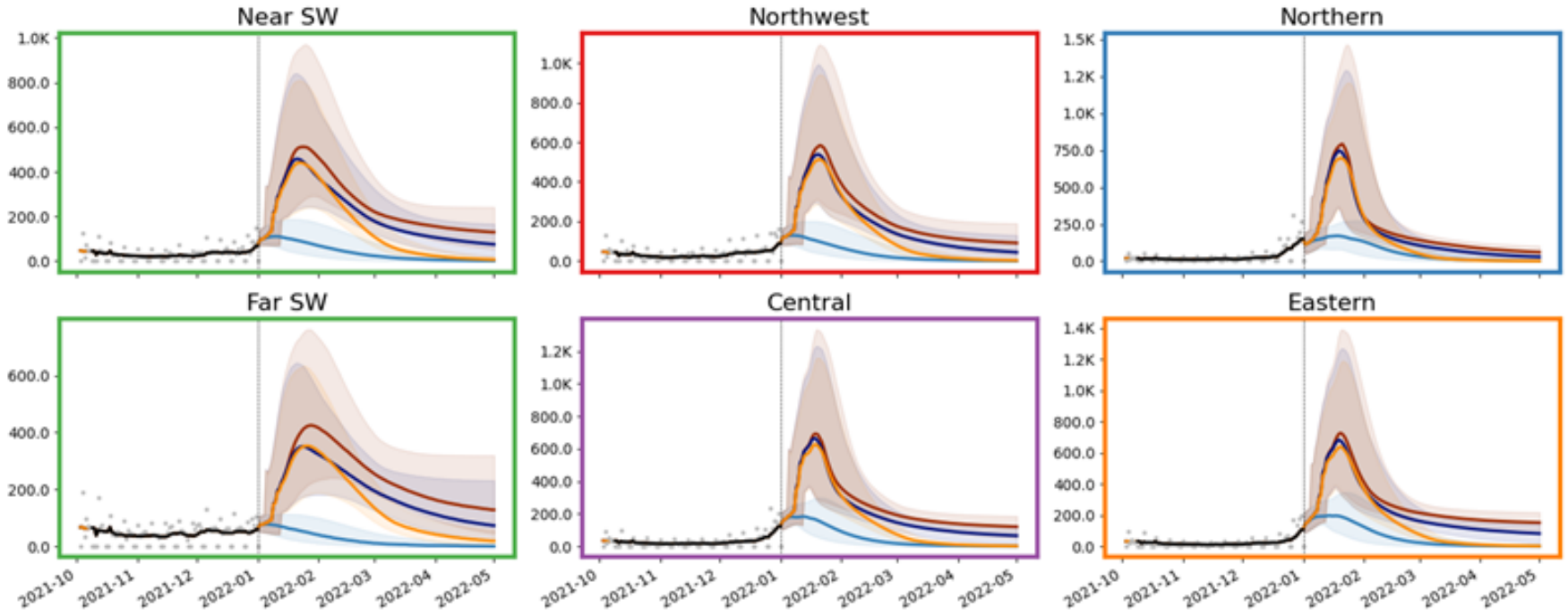
Daily Hospitalized



Daily Deaths



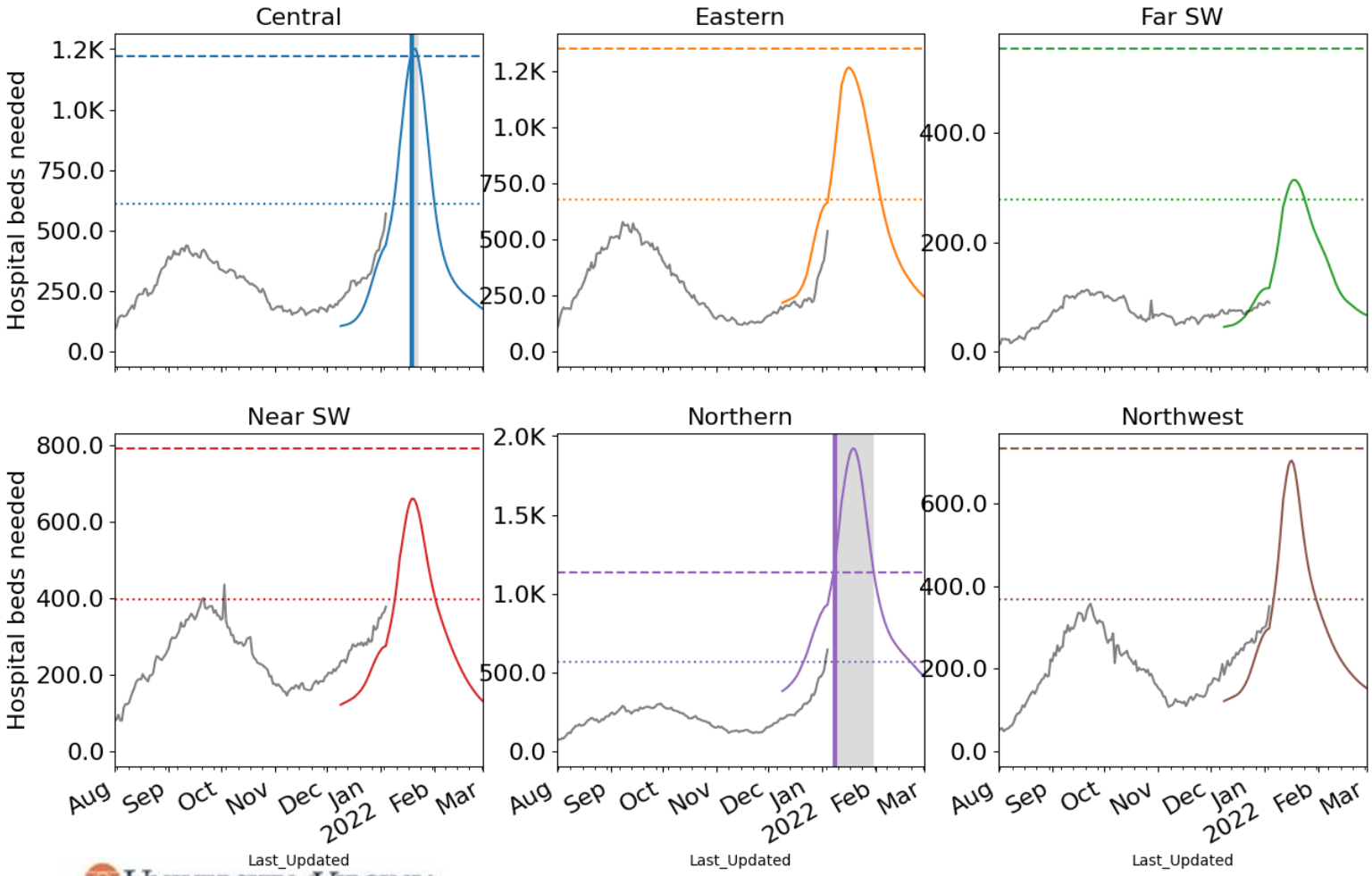
Regional Projections



Hospital Demand and Capacity by Region

Capacities by Region - Omicron

COVID-19 capacity ranges from 80% (dots) to 120% (dash) of total beds



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* Assumes average length of stay of 8 days

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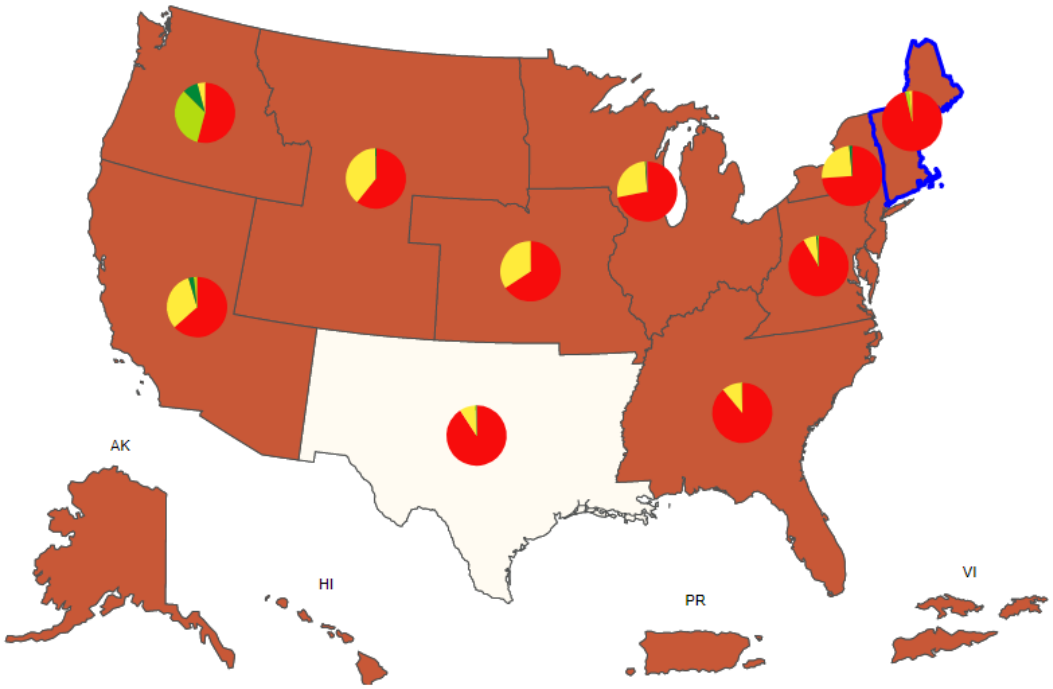
Influenza


AK
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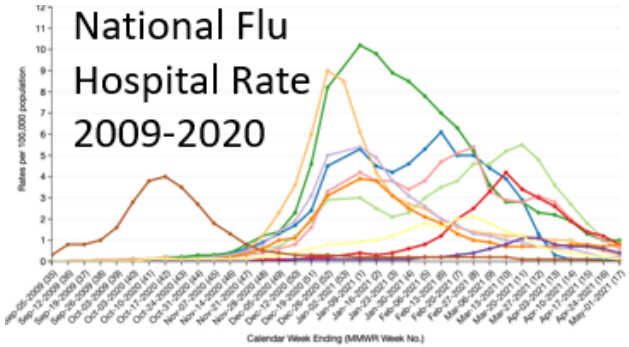
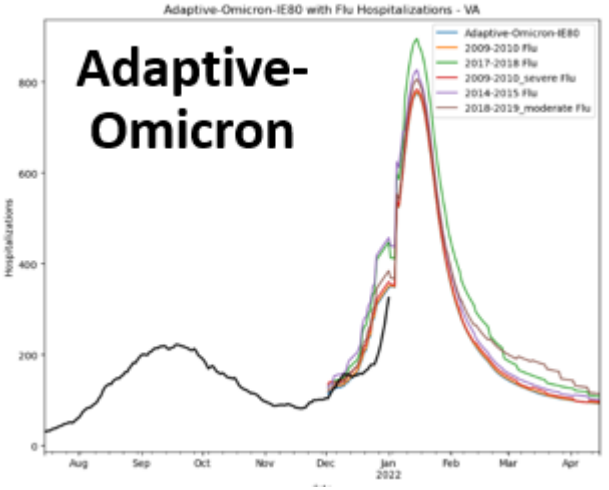

National Flu
Hospital Rate
2009-2020
Rates per 100,000 population
Calendar Week Ending (MMWR Week No.)


Adaptive-Omicron-IE80 with Flu Hospitalizations - VA
Adaptive-
Omicron
Adaptive-Omicron-IE80
2009-2010 Flu
2017-2018 Flu
2009-2010_severe Flu
2014-2015 Flu
2018-2019_moderate Flu
Hospitalizations
800
600
400
200
0
Aug
Sep
Oct
Nov
Dec
Jan
2022
Feb
Mar
Apr

Metaculus Projections

- Key Forecasts
  - Additional booster authorized by FDA for adults: 70%
  - Peak summer cases exceed winter in next 5 years: 40%
  - Another WHO PHEIC declaration before 2H 2025: 75%
  - Widespread flu in Va: 9.4 weeks

Metaculus

Where to find modeling results

- VDH COVID-19 Data Insights
  https://www.vdh.virginia.gov/coronavirus/covid-19-data-insights/
  - Model Explorer
  - UVA Biocomplexity Institute Slides
  - Surveillance Slides
  - Weekly Update

The Surveillance and Modeling Units provide an update every other Thursday at noon.

Please contact Justin Crow
justin.crow@vdh.virginia.gov
to be added to that invite.