

COVID-19 Update

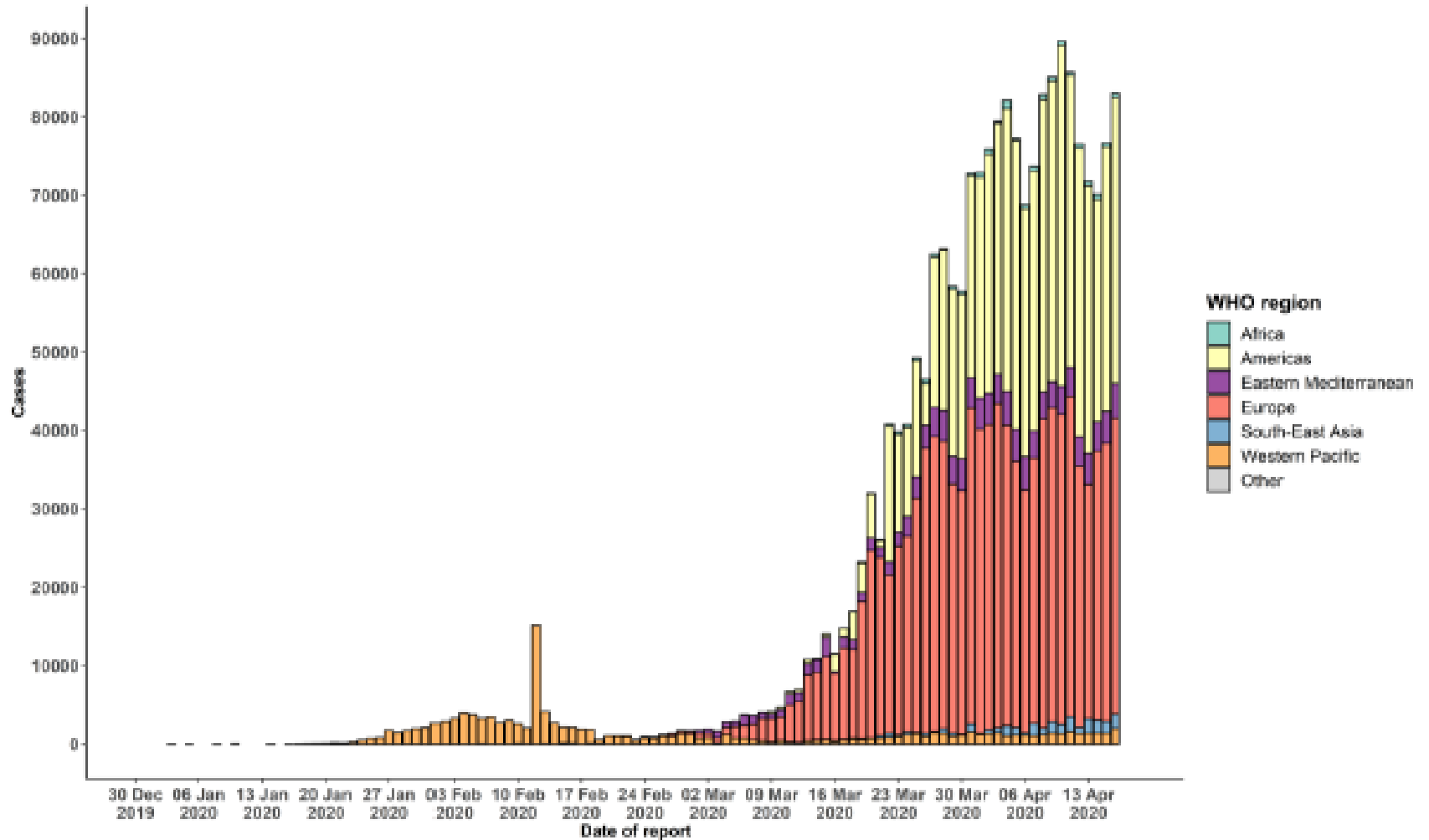
Briefing for MSV

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Virginia Department of Health

April 24, 2020

EPIDEMIOLOGY

Figure 2. Epidemic curve of confirmed COVID-19, by date of report and WHO region through 17 April 2020



Confirmed COVID-19 Cases and Deaths Across the Globe

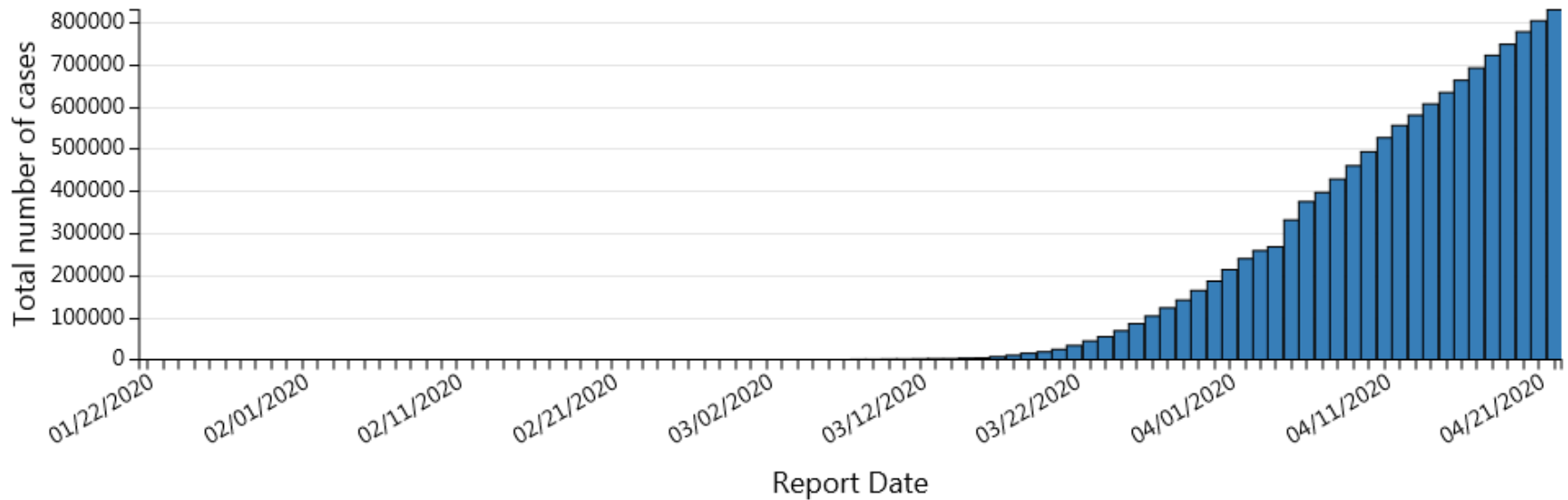
Reported by the World Health Organization

	As of March 2		As of April 17	
	Cases	Deaths	Cases	Deaths
World	88,948	3,043	2,074,529	139,378
China	80,174	2,915	84,149	4,642
U.S.	62	0	632,781	28,221
Other	8,712	128	1,357,599	106,515

Number of COVID-19 Cases in the U.S., by Date Reported²

January 22 to April 22, 2020

(n=828,441)

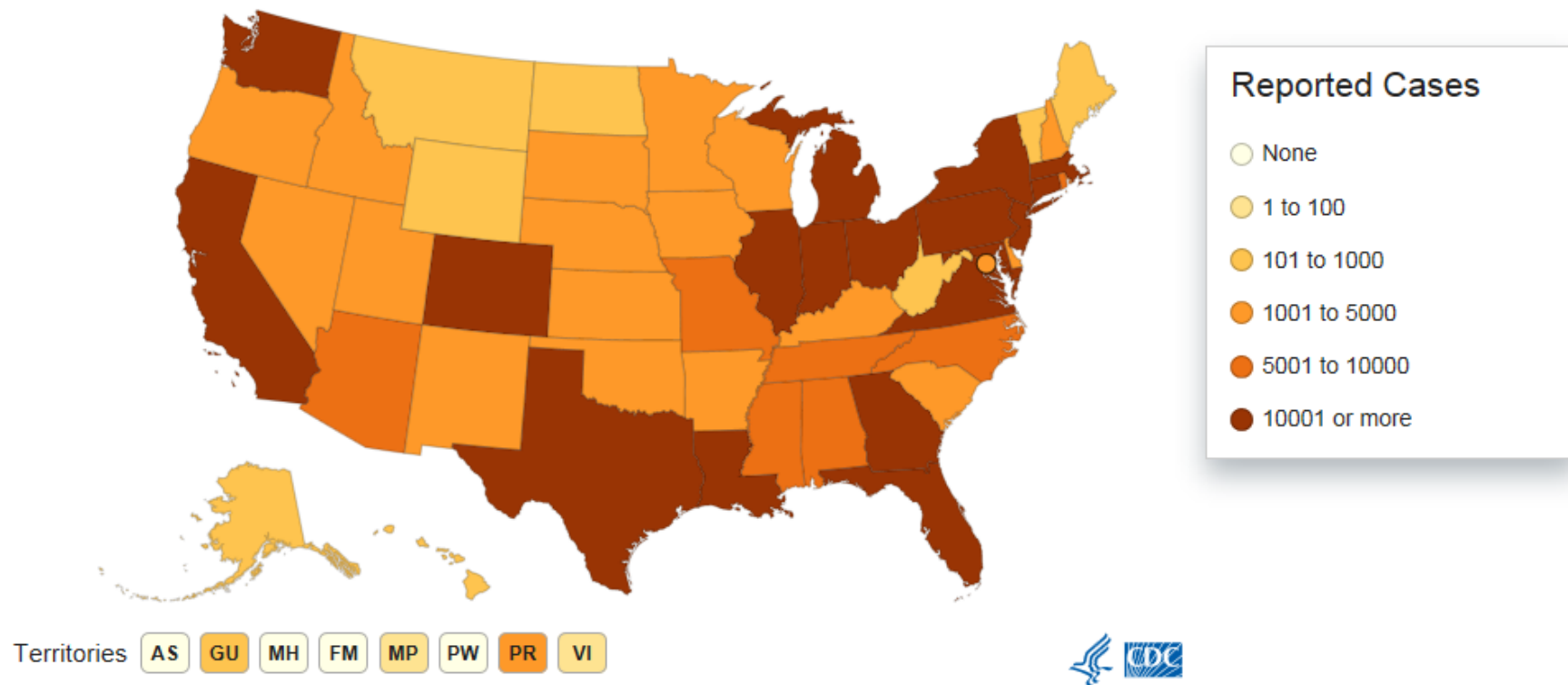


Total Cases*	Total Deaths*	Total Jurisdictions**
828,441	46,379	55

Number of COVID-19 Cases in the U.S., by State or Territory^{2,3}

As of April 22, 2020

This map shows confirmed and probable COVID-19 cases reported by U.S. states, U.S. territories, and the District of Columbia. Each [state's health department](#) reports how much the virus has spread in their community.



Geographic Differences in U.S. COVID-19 Cases, Deaths and Incidence

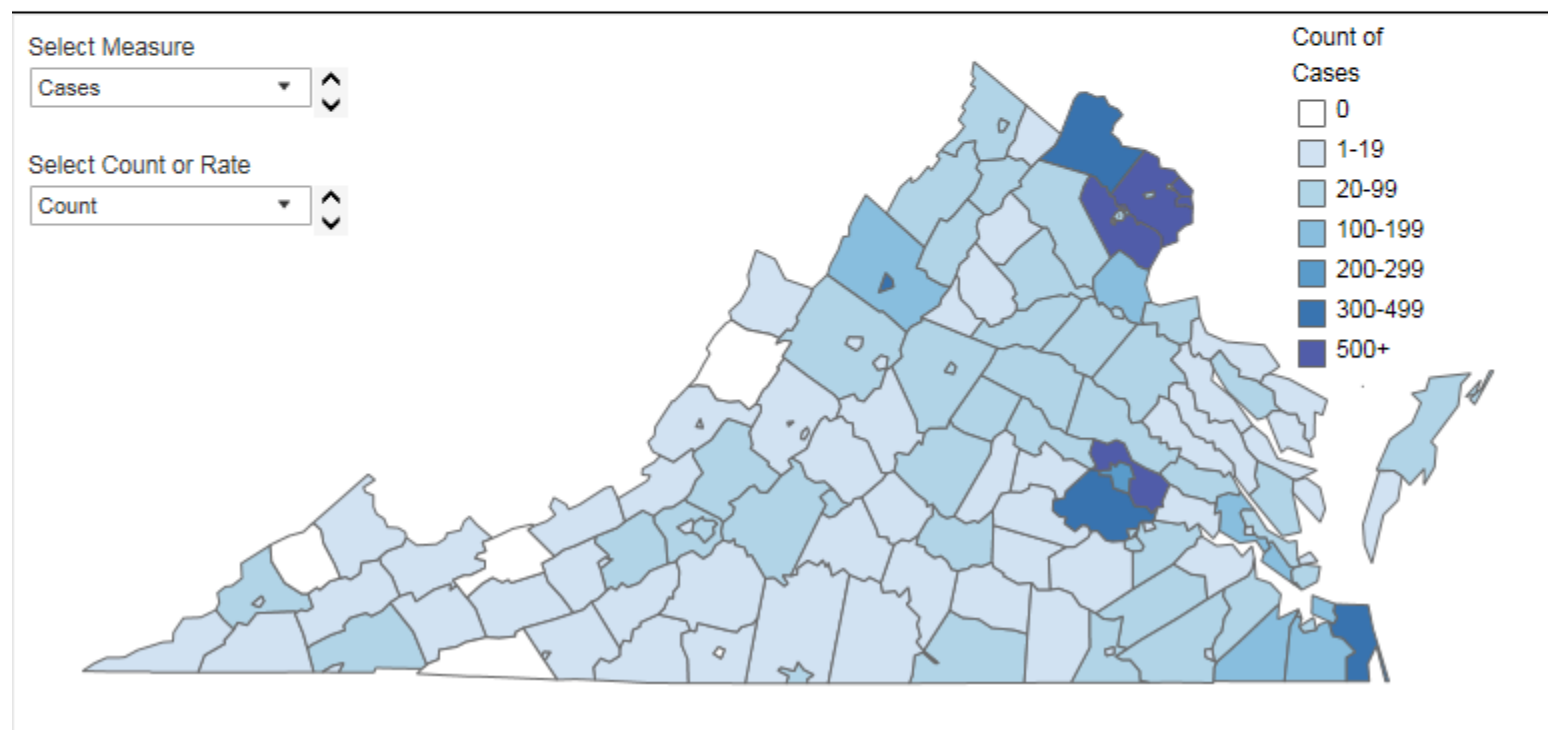
- February 12 - April 7, 2020 (n=396,000)
 - Case doubling time = 6.5 days (Range: 5.5 - 8.0)
- 2/3 of all cases were in 8 jurisdictions: NYC, NY, NJ, MI, CA, LA, MA, PA
 - 53% of deaths in 3 places: NYC, NY, NJ
- National cumulative incidence: 120/100,000
 - Range across states: 21 - 915 cases/100,000

Factors Behind Geographic Variations

- Timing of Introduction of COVID-19
- Population density
- Access to and use of PCR viral testing programs
- Use of community mitigation strategies
- Ages of infected populations (especially LTCF)
- Underlying diseases of infected populations
- “Social supports” of infected populations

COVID-19 Cases in Virginia

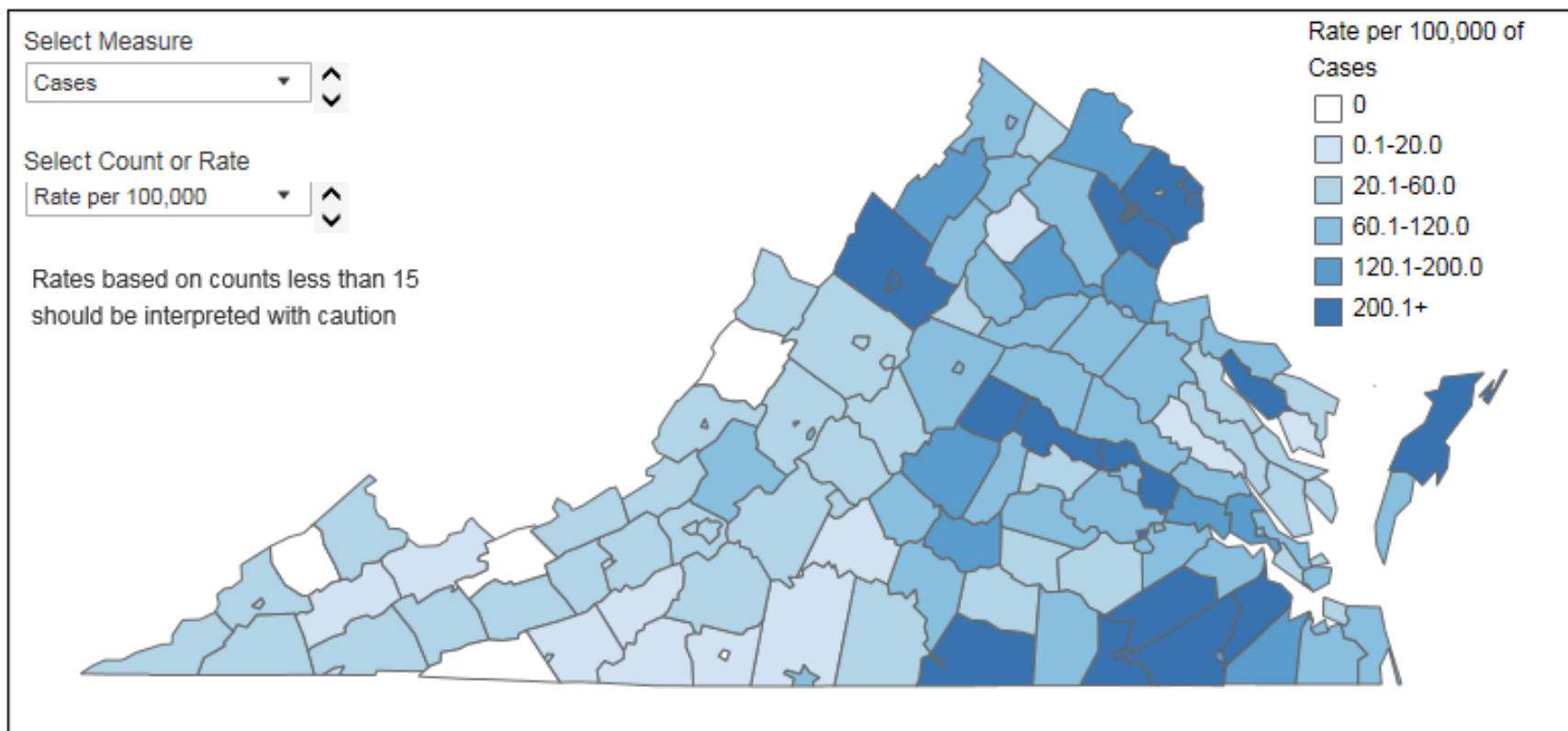
Number of People Tested [^]	Total Cases*	Total Hospitalizations**	Total Deaths
64,518	10,998	1,753	372
	Confirmed† Probable†	Confirmed† Probable†	Confirmed† Probable†
	10,627 371	1,743 10	370 2



As of April 23, 2020

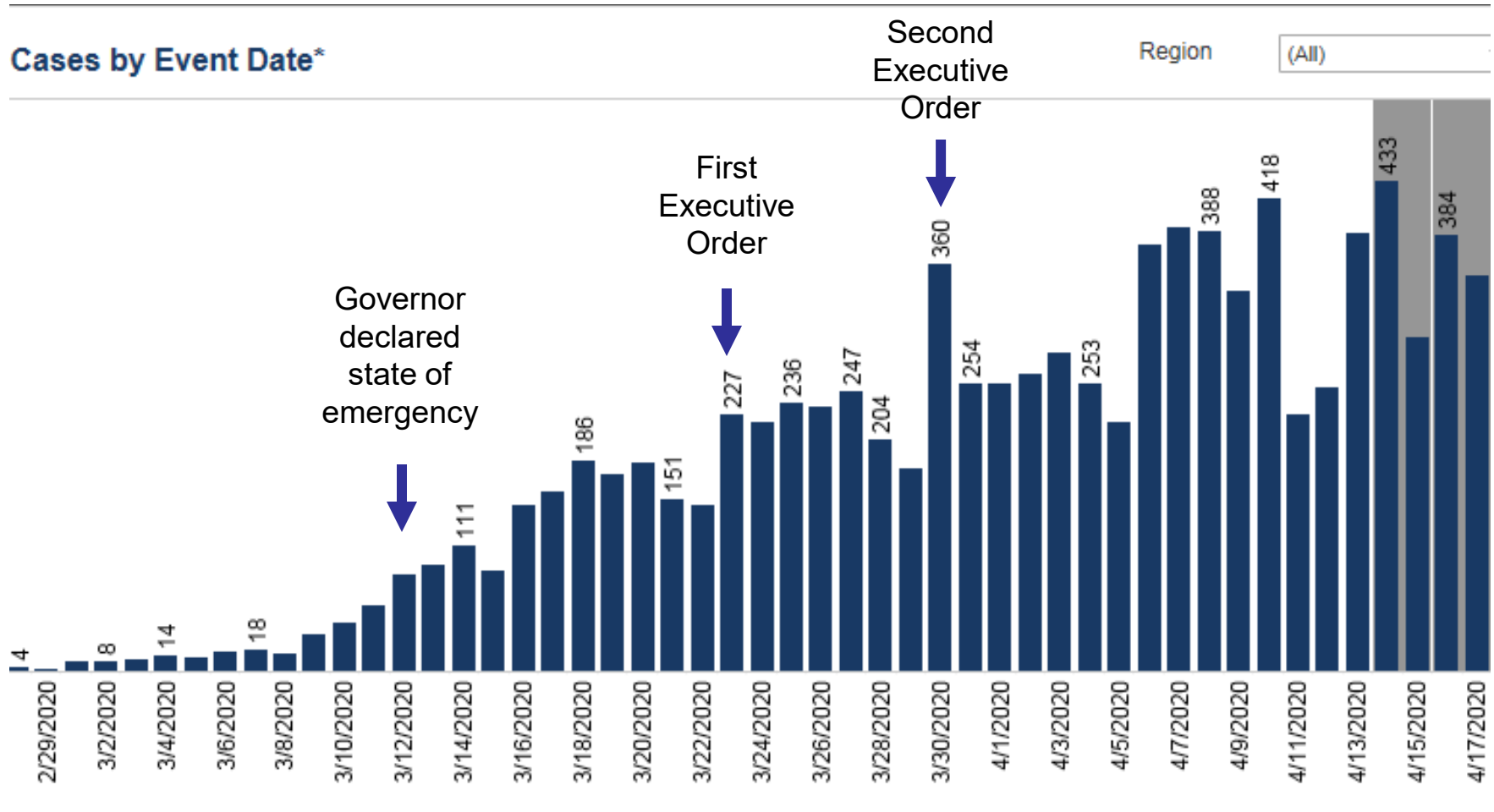
COVID-19 Cases in Virginia

Rate per 100,000, By Locality



Number of COVID-19 Cases in Virginia, by Event Date

February 28 to April 17, 2020* (n=7,491)



VA COVID-19 Data by Age Group

As of 4-21-20, 9,630 total cases

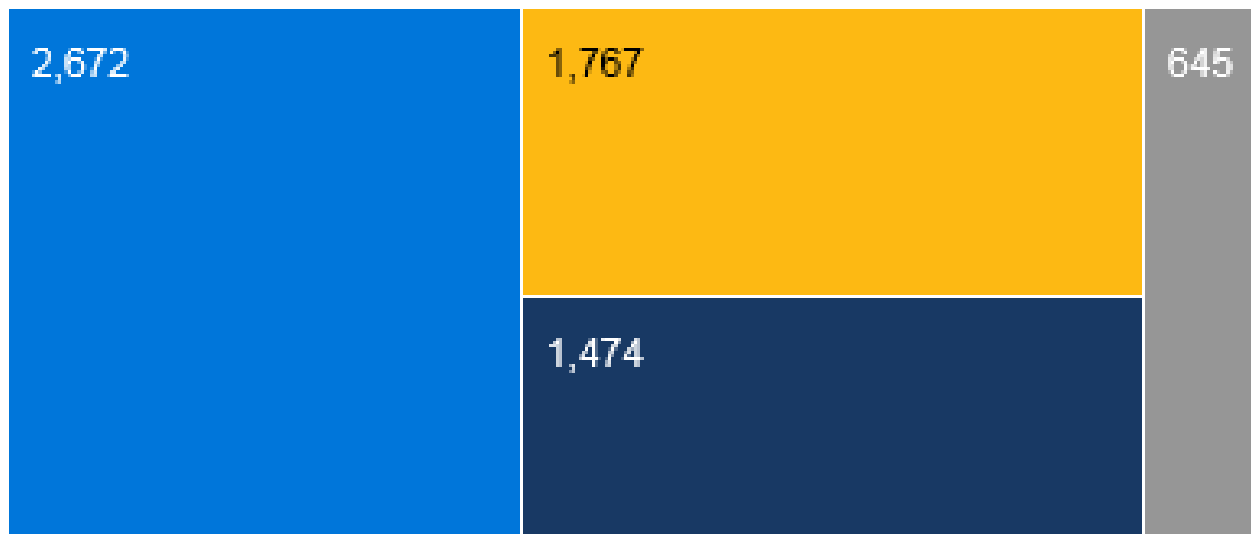
Age Group	Percent of			
	Virginia Population	Total Cases	Total Hosp'zations	Total Deaths
0-9	12%	1%	0%	0%
10-19	13%	2%	0%	0%
20-29	14%	12%	4%	0%
30-39	14%	15%	7%	1%
40-49	13%	17%	12%	2%
50-59	14%	19%	19%	6%
60-69	11%	15%	22%	18%
70-79	7%	9%	19%	27%
80+	4%	9%	17%	46%

VA COVID-19 Data by Race & Ethnicity

As of April 21, 2000

Case Demographics: Race and Ethnicity

Not Reported: 3,072



Race

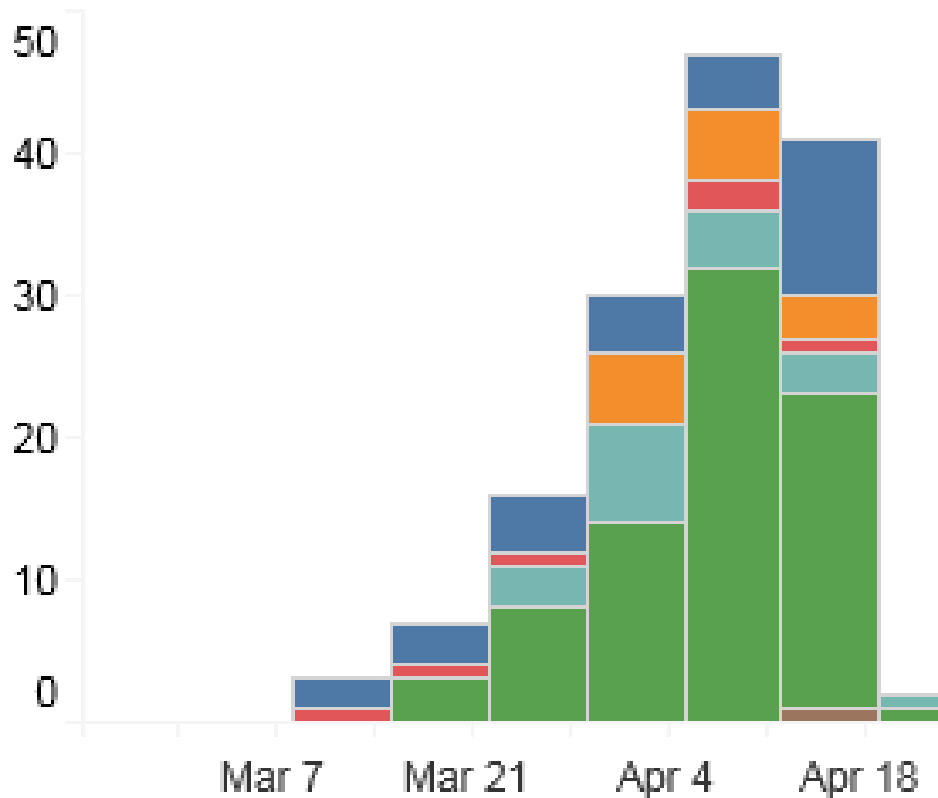
Hispanic or Latino
non-Hispanic Black

non-Hispanic white
Other

COVID-19 Outbreaks Reported in Virginia

As of April 21, 2020

Outbreaks by Week



Number of Confirmed
Outbreaks Reported to
Public Health

148

Facility Types

- Congregate Setting
- Correctional Facility
- Educational Setting
- Healthcare Setting
- Long Term Care Facilities
- Gym/Spa

Week Beginning Date - Sunday through Saturday

Risk Factors for COVID-19 Outbreaks in Long Term Care Facilities

- Challenges to adhering to infection control practices
 - Inadequate PPE and other supplies
- Inadequate staffing
- Staff working while symptomatic
- Some staff unfamiliar with PPE guidelines
- Delayed case recognition
 - Low index of suspicion (of COVID-19)
 - Difficulty of clinical diagnosis
 - Limited COVID-19 testing ability
- Inter- and intra-facility transfer of residents

COVID-19 Symptoms

- Fever
- Cough
- Shortness of breath or difficulty breathing
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

Asymptomatic (or Pre-symptomatic) Spread of SARS-CoV-2 Virus

- 2-3 days of pre-symptomatic spread possible in some patients
- Some children and some elderly people are asymptomatic during entire infection course
 - Many infected but asymptomatic people found in recent LTCF studies
- Prolonged PCR-positivity in some pts after symptoms resolve
 - Studies ongoing to understand how related to infectiousness

U.S. Health Care Personnel with COVID-19

February 12 - April 9, 2020

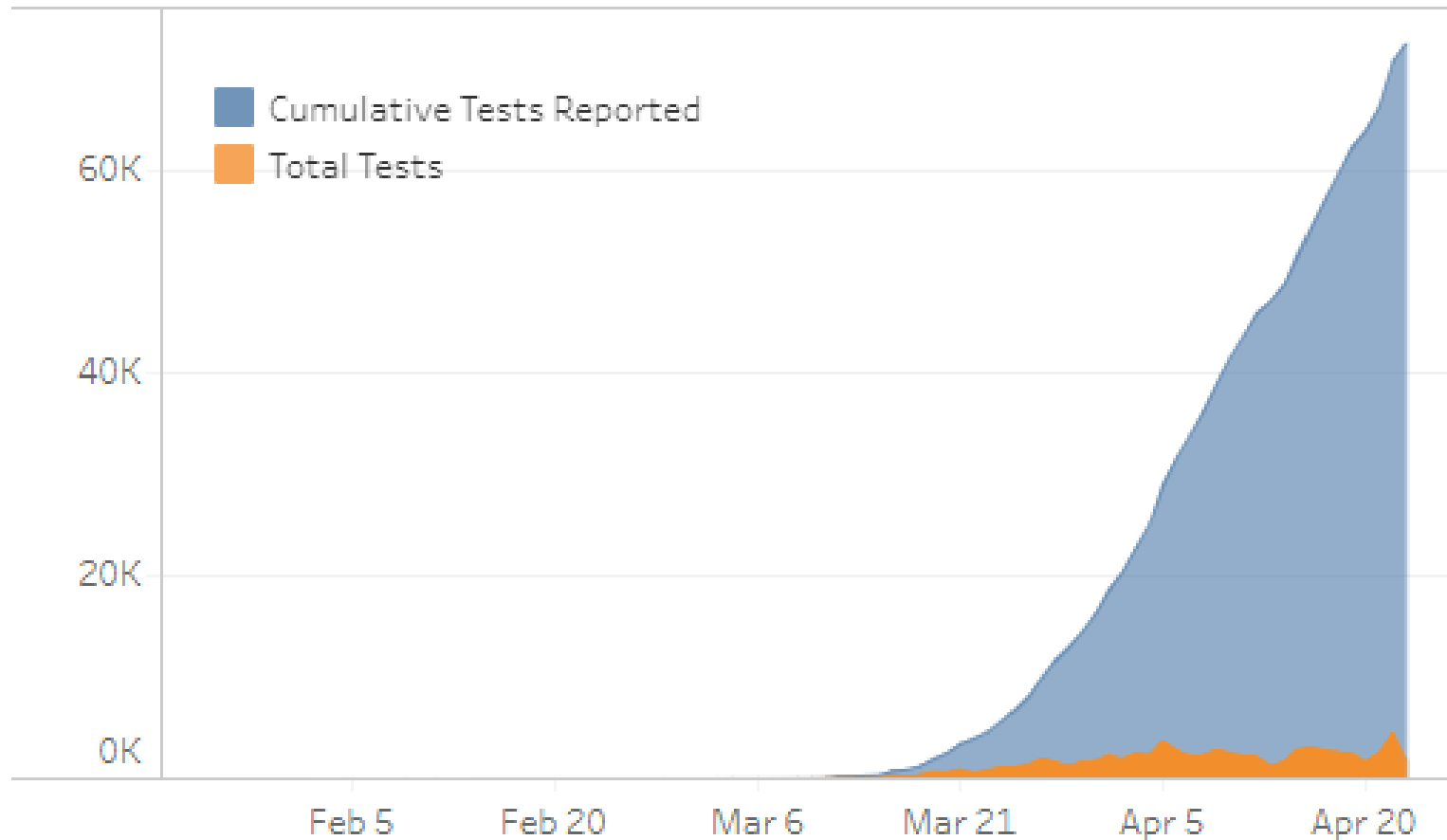
Among HCP identified (n=9,282):

- 92% had cough, fever and/or shortness of breath
- 73% female
- Mean age = 42
- 38% with ≥ 1 underlying illness
- 55% reported contact with COVID-19 only in health care setting
- 8-10% hospitalized
 - 2-5% admitted to ICU; 0.3-0.6% died
 - 6% were aged ≥ 65 years old; 37% of total deaths

TESTING IN VIRGINIA

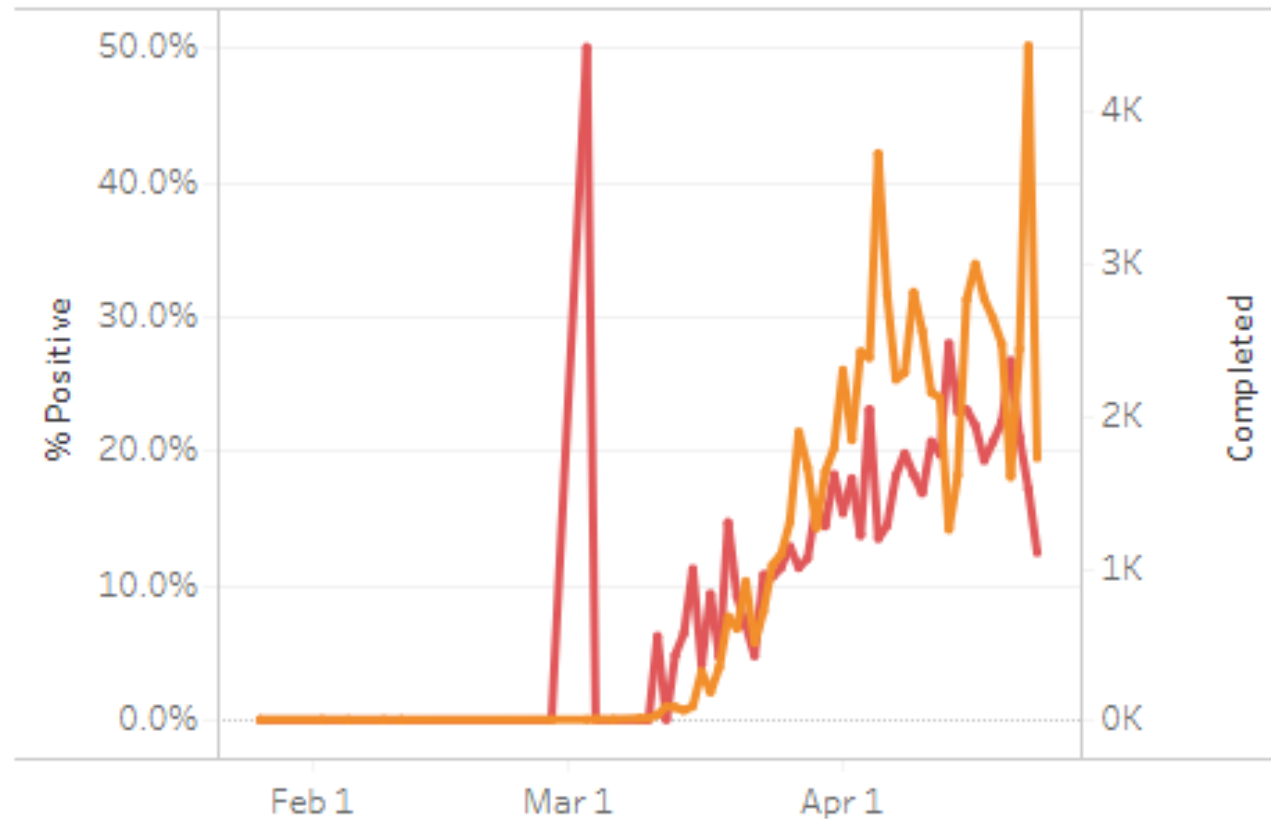
COVID-19 Tests Reported to VDH

Total Test Results by Day & Cumulative



COVID-19 Tests Reported to VDH

Total Test Results & % Positive by Day



Number of COVID-19 Tests Reported by Day

Percent of COVID-19 Reported Tests that were Positive by Day

SARS-CoV-2 Testing

	Nucleic acid amplification test for viral RNA	Antibody detection
Technology	Molecular	Serologic
Measure	Current infection	Recent or past exposure
Specimen	Includes nasopharyngeal swab, oropharyngeal swab, sputum, BAL	Blood
Value	Identify infection (diagnosis)	Identify exposed or possibly recovered individuals
Considerations	Many different tests. VDH recommends tests evaluated by FDA through EUA process.	Immune response to SARS-CoV-2 is not well understood. Length of antibody persistence and level of protection is not known.

Serology Testing

- There are a lot of unknowns
 - How should results be interpreted?
 - How long do antibodies persist?
 - What level is considered protective?
- As of 4/21/20
 - 4 tests granted an [EUA by FDA](#) (2 for diagnostic testing, 2 for research/surveillance)
 - Others offered under special [COVID-19 FDA policy](#)
 - Listed on [FDA FAQ page](#) - NOT reviewed by FDA unless EUA was submitted and reviewed
 - Performance likely varies widely

Point-of-Care Testing

- To improve availability of testing, FDA issued emergency use authorization for CLIA-waived point-of-care diagnostic tests
- The authorized setting for each test type can be found on the [FDA's website](#)
 - CLIA-waived point-of-care tests are indicated with a “W” under the “Settings for Use” column

COVID-19 Testing Availability

Virginia Public Health Lab (DCLS)

- Molecular testing only
- Reserved for patients meeting [VDH public health priority investigation criteria](#)
- [VDH approval is required](#) - specimens should not be sent without approval
- Specimen collection guidance available on [DCLS website](#)

Private Labs

- List of private and commercial labs offering testing for Virginia residents is [here](#)
- VDH approval is not necessary
- Contact your lab provider to determine testing availability
- Provide complete demographic information on testing request form

Community Testing

- Provide improved access to testing
- VDH approval is not necessary
- Local health departments are working with community partners to set up testing sites and target hard-to-reach populations
- Testing event details provided by local health department or partners

List of available testing sites in Virginia is [here](#)

Criteria for DCLS Testing

Clinical Features		Epidemiologic Risk	
Fever, cough, shortness of breath, difficulty breathing, or sore throat <ul style="list-style-type: none"> Fever may not be present in some persons Older adults may have atypical symptoms 	AND	Healthcare worker or first responder	
		Hospitalized	
		Resides or works or is about to be admitted into a congregate setting	
		Potential cluster of unknown respiratory disease (priority for healthcare facilities)	
		Underlying Condition that increases risk of severe disease (new)	
		Uninsured or underinsured (new)	
		Newborn of mother with COVID-19 diagnosed at delivery (new)	

More details can be found on the [VDH Updated Testing Guidance](#)

Testing Resources

- FDA
 - [List of FDA Authorized Tests](#)
 - [FDA Serology Testing FAQs](#)
- Other
 - [Report from the American Society for Microbiology COVID-19 International Summit, 23 March 2020: Value of Diagnostic Testing for SARS-CoV-2/COVID-19](#)

MODELING

Modeling



Statistical Models

- IHME model
- Projections based on curves that are fitted to historical data
- Include other factors as controls, such as policy responses

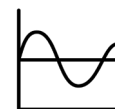
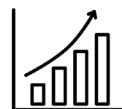


Systems Dynamics Models



- UVA model and CHIME model
- Assume exponential growth in the number infected
- Rely on estimates of the rate of spread





Model Strengths & Weaknesses



Type of Model	Systems Dynamics	Statistical	Alternative
Example	UVA and CHIME	IHME	VDH
Degree of a Threat			Surveillance
Rate of Spread			Surveillance
Extent of Spread			Experts
Timing of the Peak			Experts
Severity			Experts

 Highly Suitable
 Suitable

 Somewhat suitable
 Not Suitable

Derived from: Manheim, David, Margaret Chamberlin, Osonde A. Osoba, Raffaele Vardavas, and Melinda Moore, Improving Decision Support for Infectious Disease Prevention and Control: Aligning Models and Other Tools with Policymakers' Needs. Santa Monica, CA: RAND Corporation, 2016.
https://www.rand.org/pubs/research_reports/RR1576.html.

UVA Model: Simulation Engine - PatchSim

Metapopulation model

- Represents each population and its interactions as a single patch
- 133 patches for Virginia counties and independent cities

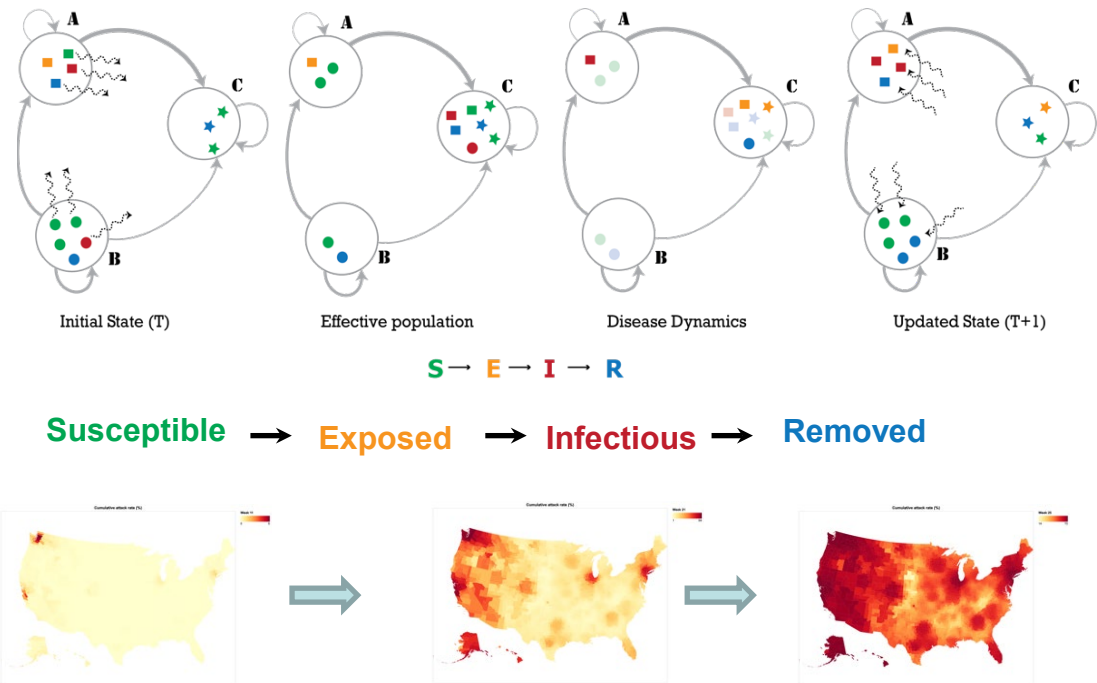
Extended SEIR disease representation

- Includes asymptomatic infections and treatments

Mitigations affect both disease dynamics and population interactions

Runs fast on high-performance computers

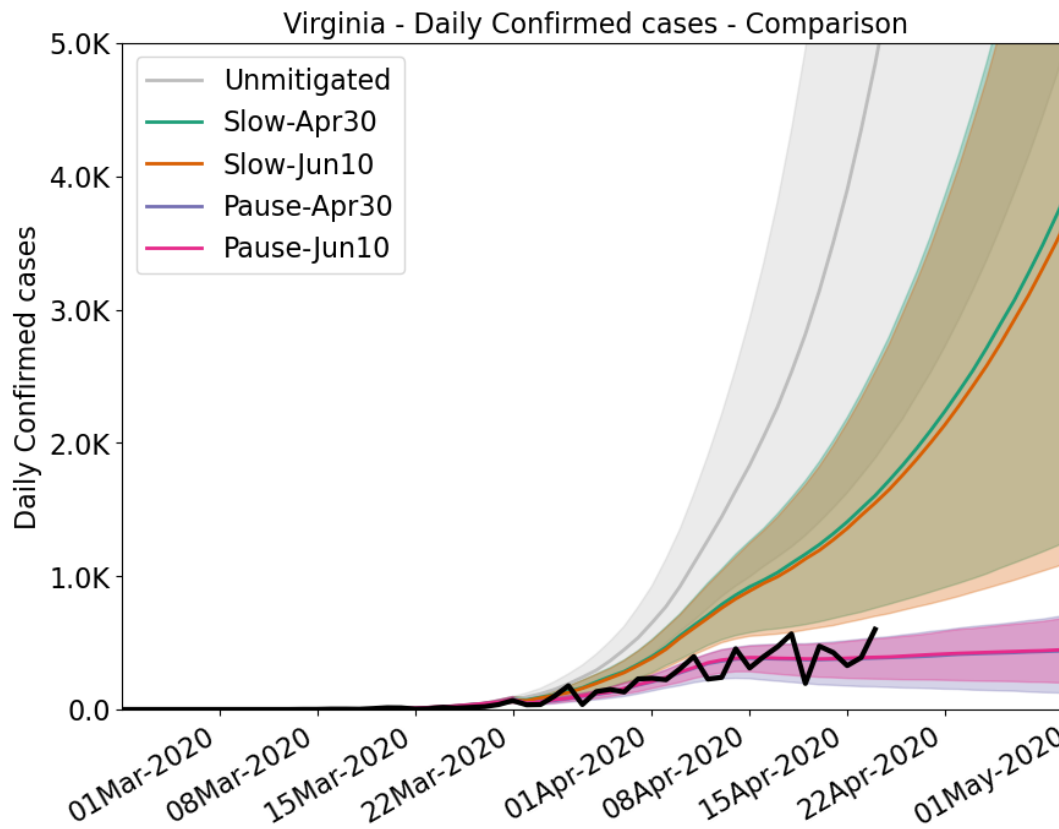
- Ideal for calibration and optimization



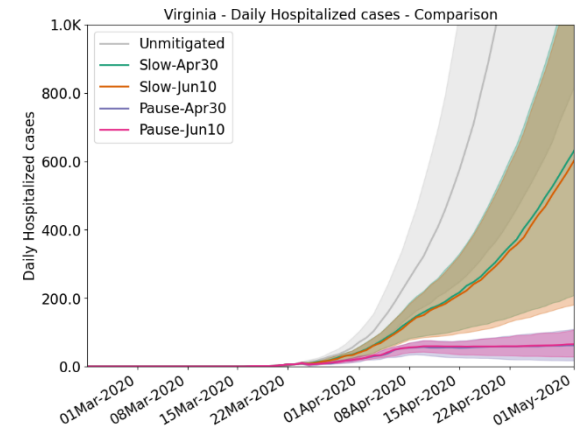
Venkatramanan, Srinivasan, et al. "Optimizing spatial allocation of seasonal influenza vaccine under temporal constraints." *PLoS Computational Biology* 15.9 (2019): e1007111.

Short-term Projections

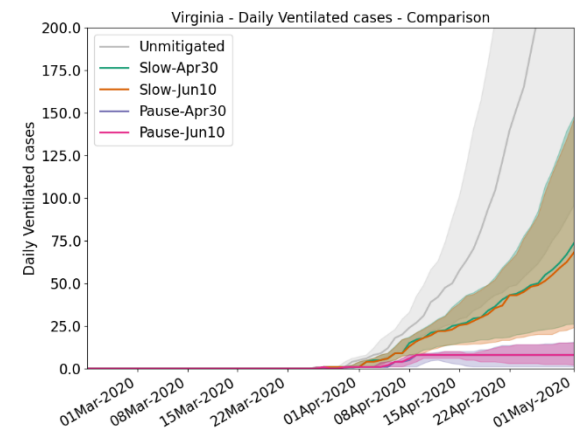
Confirmed cases



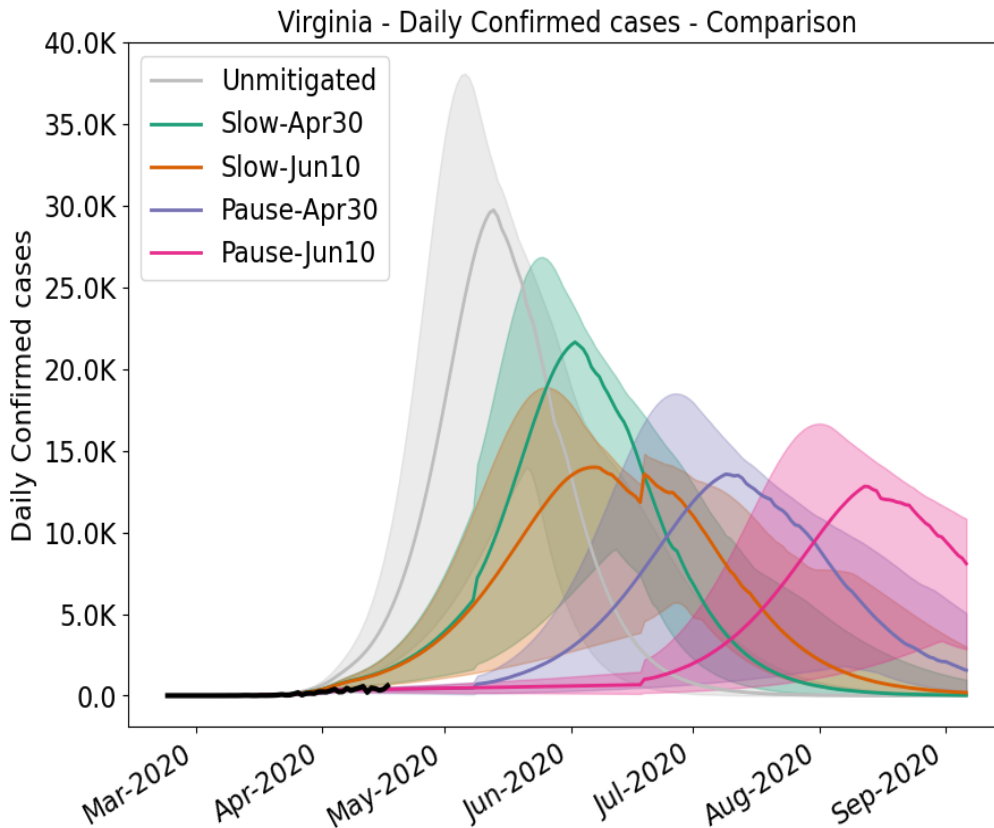
Hospitalizations



Ventilated Cases



Stay the Course: Future Depends on Policy



Weekly New Confirmed Cases*

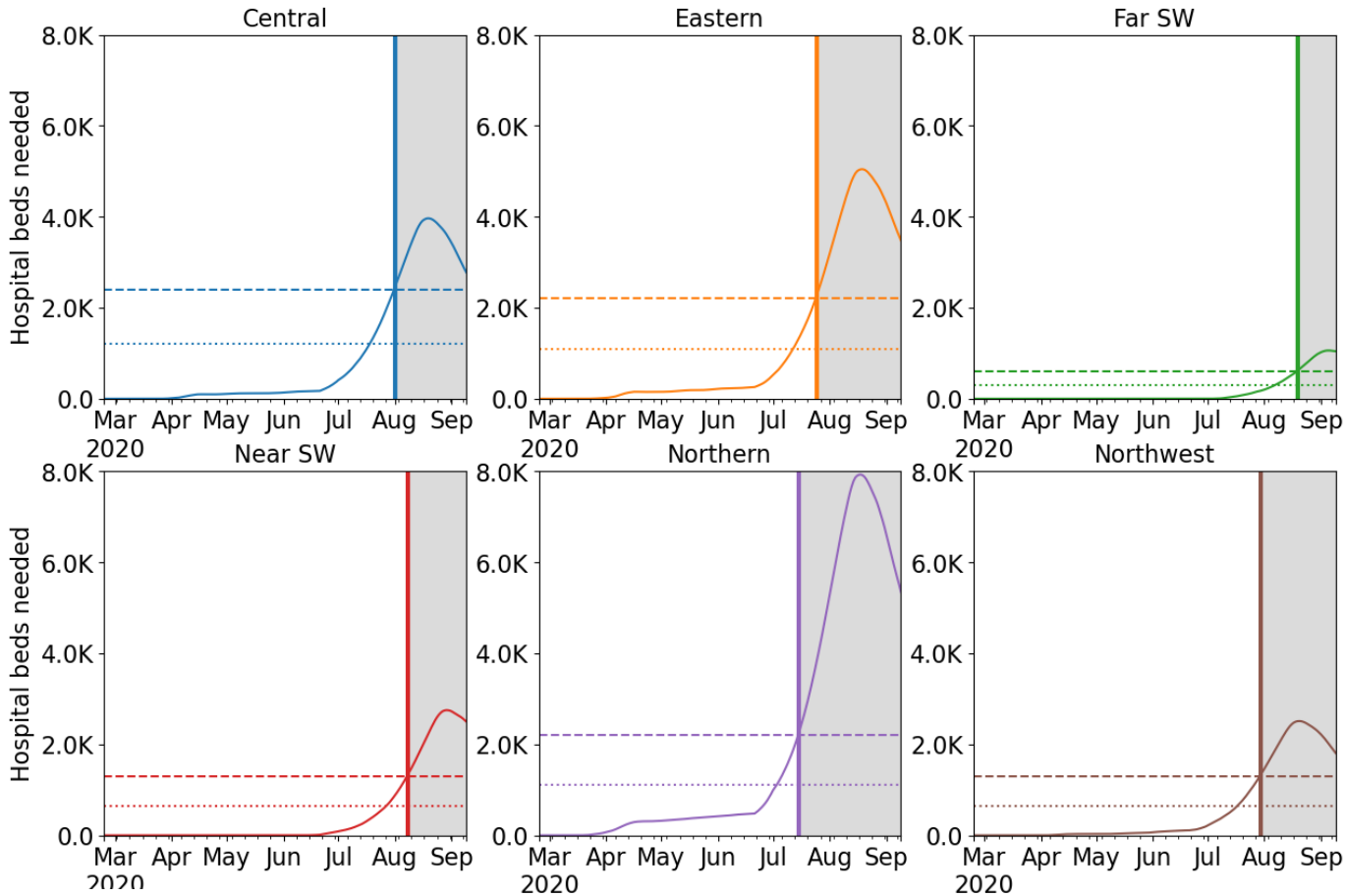
Week Ending	Unmitigated	Slow-Apr30	Pause-Jun10
4/12/20	25,081	9,341	2,690
4/19/20	52,280	14,769	2,878
4/26/20	99,816	23,060	3,076
5/3/20	161,820	34,911	3,279
5/10/20	199,424	62,282	3,494
5/17/20	181,024	96,540	3,714
5/24/20	134,380	131,506	3,936
5/31/20	85,116	145,552	4,145
6/7/20	47,402	133,432	4,362
6/14/20	24,724	106,902	4,938
6/21/20	12,258	75,603	8,582
6/28/20	6,007	49,996	13,118

*Numbers are medians of projections

Hospital Demand and Capacity

Capacities by Region – Pause June 10

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



UVA Model: Key Takeaways

- Projecting future cases precisely is impossible and unnecessary. Even without perfect projections, we can confidently draw conclusions:
- **Current social distancing efforts are working.**
- Under current conditions, Virginia *as a whole* will have sufficient medical resources for at least the next couple months.
- Lifting social distancing restrictions too soon can lead quickly to a second wave.
- Further modeling could explore the effectiveness of containment strategies (test-isolate-contact tracing-quarantine).
- The situation is changing rapidly. Models will be updated regularly.

GUIDANCE FOR OUTPATIENT PROVIDERS

COVID-19 Personal Protective Equipment (PPE) for Healthcare Personnel

Preferred PPE – Use N95 or Higher Respirator



Acceptable Alternative PPE – Use Facemask



Universal Masking of Healthcare Personnel

To address asymptomatic and pre-symptomatic transmission, implement universal masking for everyone entering a healthcare facility (e.g., healthcare personnel, patients, visitors), regardless of symptoms

Facemask

- Contain respiratory secretions of individual AND provide protection against respiratory droplets
- Recommended for HCP providing direct patient care
- To avoid risking self-contamination, HCP should consider continuing to wear their respirator or facemask ([extended use](#)) instead of intermittently switching back to their cloth face covering

Cloth Face Covering

- Contain respiratory secretions of individual, not considered protective
- Recommended for visitors, patients, and HCP not providing direct patient care (e.g., clerical personnel)
- Should be laundered regularly (e.g., daily and when soiled), and, hand hygiene should be performed immediately before and after any contact with the cloth face covering

PPE Resources

- CDC Resources
 - [Using PPE](#)
 - [Strategies to Optimize Supplies](#)
 - [PPE Burn Rate Calculator](#)
 - [Decontamination and Reuse of Filtering Facepiece Respirators](#)
- FDA Resource
 - [FDA Emergency Use Authorization of Respiratory Protection Devices](#)

HCP Exposure in Healthcare Facilities

- Forego contact tracing for exposures in a healthcare setting
- Perform universal source control for healthcare personnel
 - Reduce facility risk
 - Isolate symptomatic patients promptly
 - Protect healthcare personnel
- Perform screening for fever and symptoms of COVID-19 before every shift

Return-to-Work Criteria

- Preferred: Exclude until fever resolved AND respiratory symptoms improved AND negative results from two consecutive nasopharyngeal specimens >24 hours apart
- Alternate (if testing not available): Exclude until at least 72 hours after fever resolved and respiratory symptoms improved AND at least 7 days have passed since symptoms first appeared
- Wear facemask when returning to work until all symptoms are resolved, or 14 days after symptom onset, whichever is longer

HCP Exposure Resources

- CDC Resources
 - [Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19](#)
 - [Strategies to Mitigate Healthcare Personnel Staffing Shortages](#)
 - [Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 \(COVID-19\) in Healthcare Settings](#)

New or Updated VDH Resources

- COVID-19 Activity Report
 - Daily www.vdh.virginia.gov/coronavirus/
 - Weekly www.vdh.virginia.gov/coronavirus/weekly-report/
- Testing
 - List of testing sites www.vdh.virginia.gov/coronavirus/covid-19-testing-sites/
 - List of private or commercial labs
www.vdh.virginia.gov/content/uploads/sites/182/2020/04/SARS-COV-2-Testing-Capabilities-Commercial-Labs.pdf
 - VDH Updated Testing Guidance www.vdh.virginia.gov/coronavirus/health-professionals/vdh-updated-guidance-on-testing-for-covid-19/
- VDH Guidance for Inpatient Obstetric Care for Persons with Confirmed or Suspected COVID-19 www.vdh.virginia.gov/content/uploads/sites/182/2020/04/VDH-Guidance-for-Persons-in-Labor-and-Delivery.pdf
- VDH When to End Home Isolation and Quarantine Infographic
www.vdh.virginia.gov/content/uploads/sites/182/2020/04/Home-IsolationQuarantine-Release-Graphic_FINAL.pdf

New or Updated CDC Guidance

Strategies for Optimizing the Supply of PPE
(4/20)

Information for Pediatric Healthcare Providers
(4/17)

Outpatient Hemodialysis Facility Recommendations
(4/16)

Strategies for Optimizing Supply of N95 Respirators
(4/16)

Evaluating and Testing Persons for Coronavirus Disease 2019 (COVID-19)
(CDC Testing Priority Groups, 4/14)

Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID-19) Guidance
(4/14)

Strategies to Mitigate Healthcare Personnel Staffing Shortages
(4/13)

Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19
(4/13)

Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Healthcare Settings (4/13)

Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19)
(4/12)

Discontinuation of Isolation for Persons with COVID-19 Not in Healthcare Settings
(4/10)

Decontamination and Reuse of Filtering Facepiece Respirators
(4/9)



Thank you!

Please send questions to:

respiratory@vdh.virginia.gov

VDH VIRGINIA
DEPARTMENT
OF HEALTH

*To protect the health and promote the
well-being of all people in Virginia.*