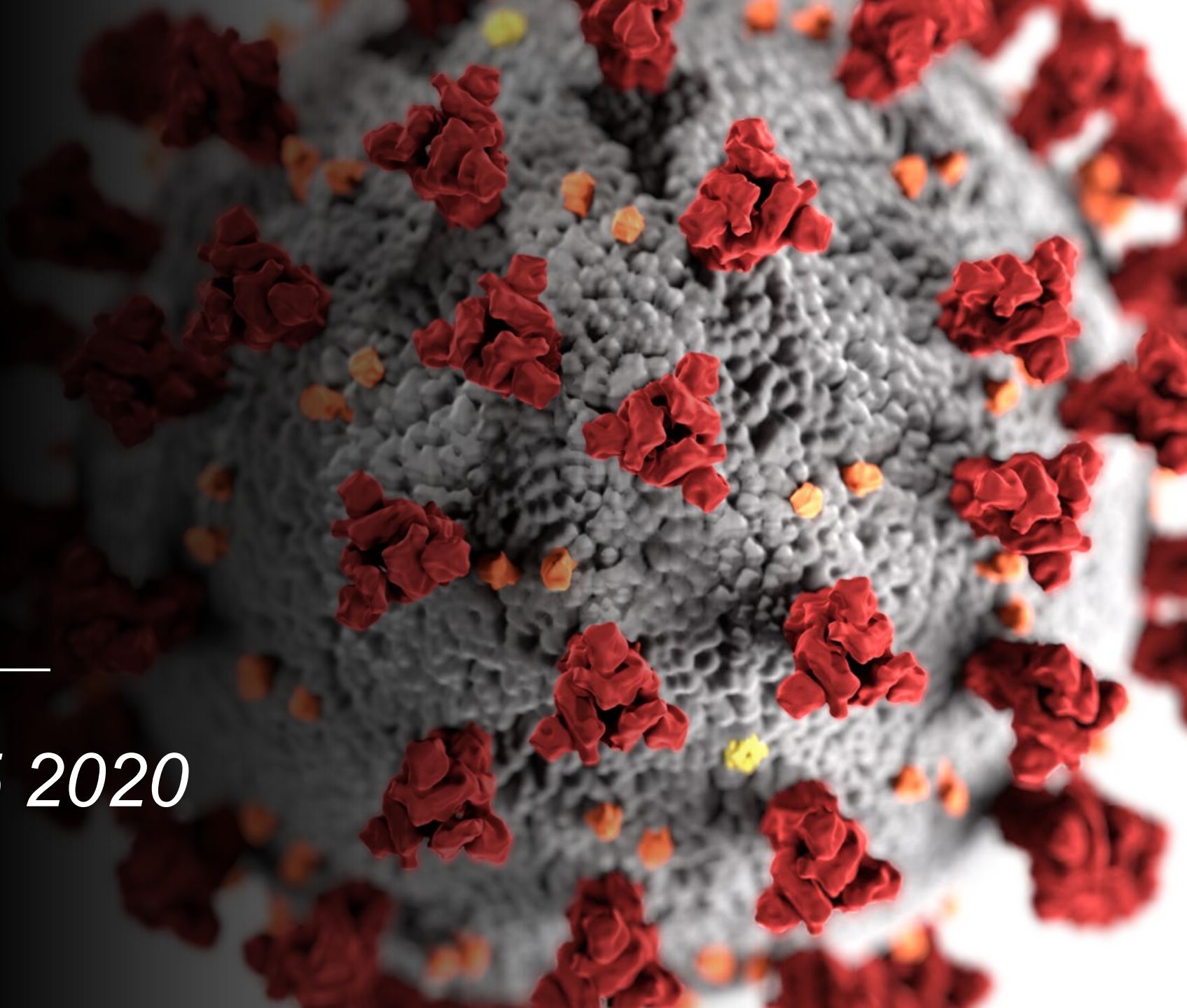


# The COVID-19 Crisis

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*Update August 5 2020*





A photograph of a man with grey hair, glasses, and a beard, wearing a green button-down shirt. He is smiling and pointing his right hand towards a rock formation. The background is a layered rock wall with various shades of tan, brown, and grey.

**CAVEAT!**

**I am not THAT kind of doctor.  
I study rocks.**

**Ariel D. Anbar**

**Professor**

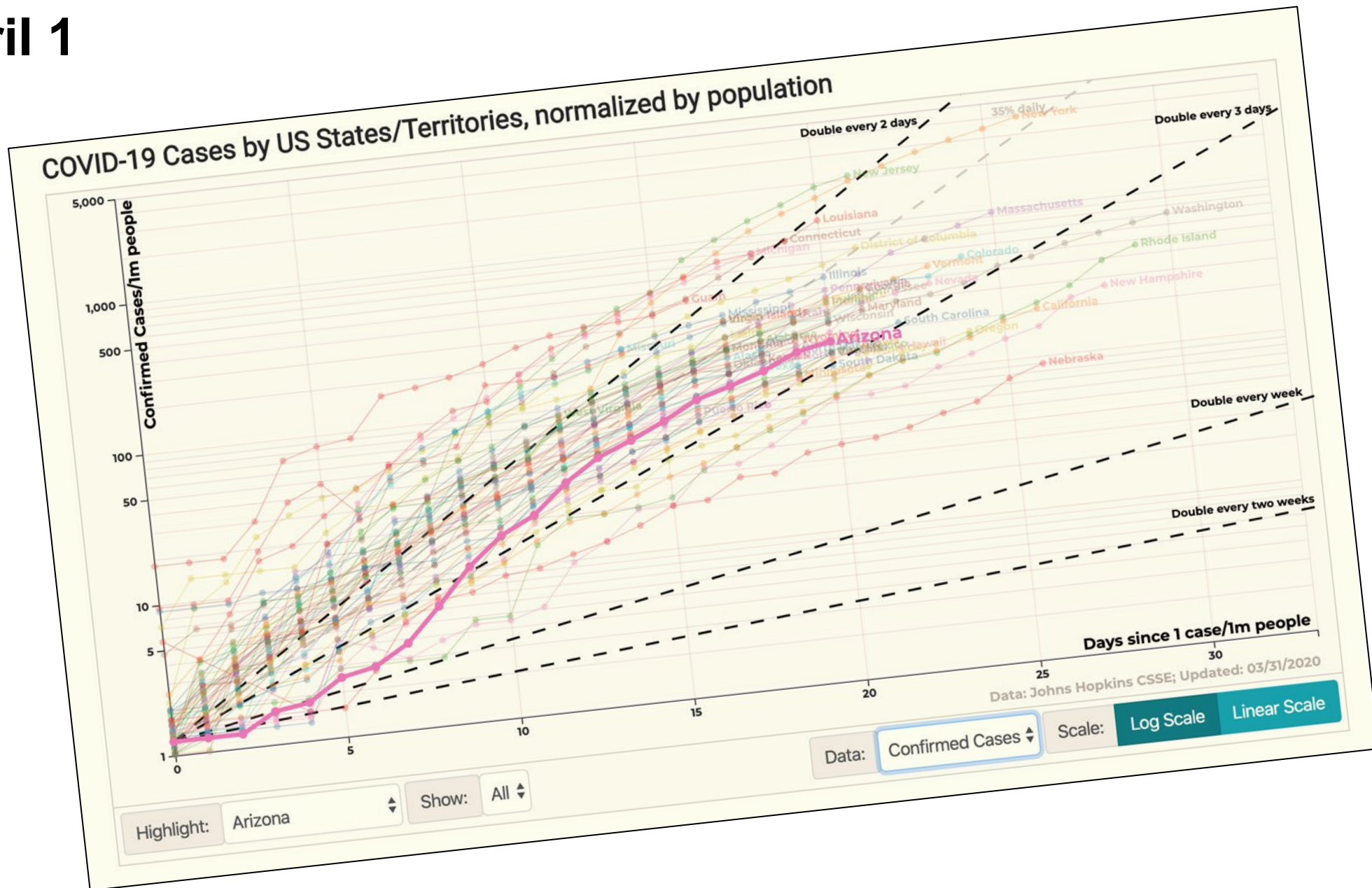
**School of Earth and Space Exploration**

**School of Molecular Sciences**

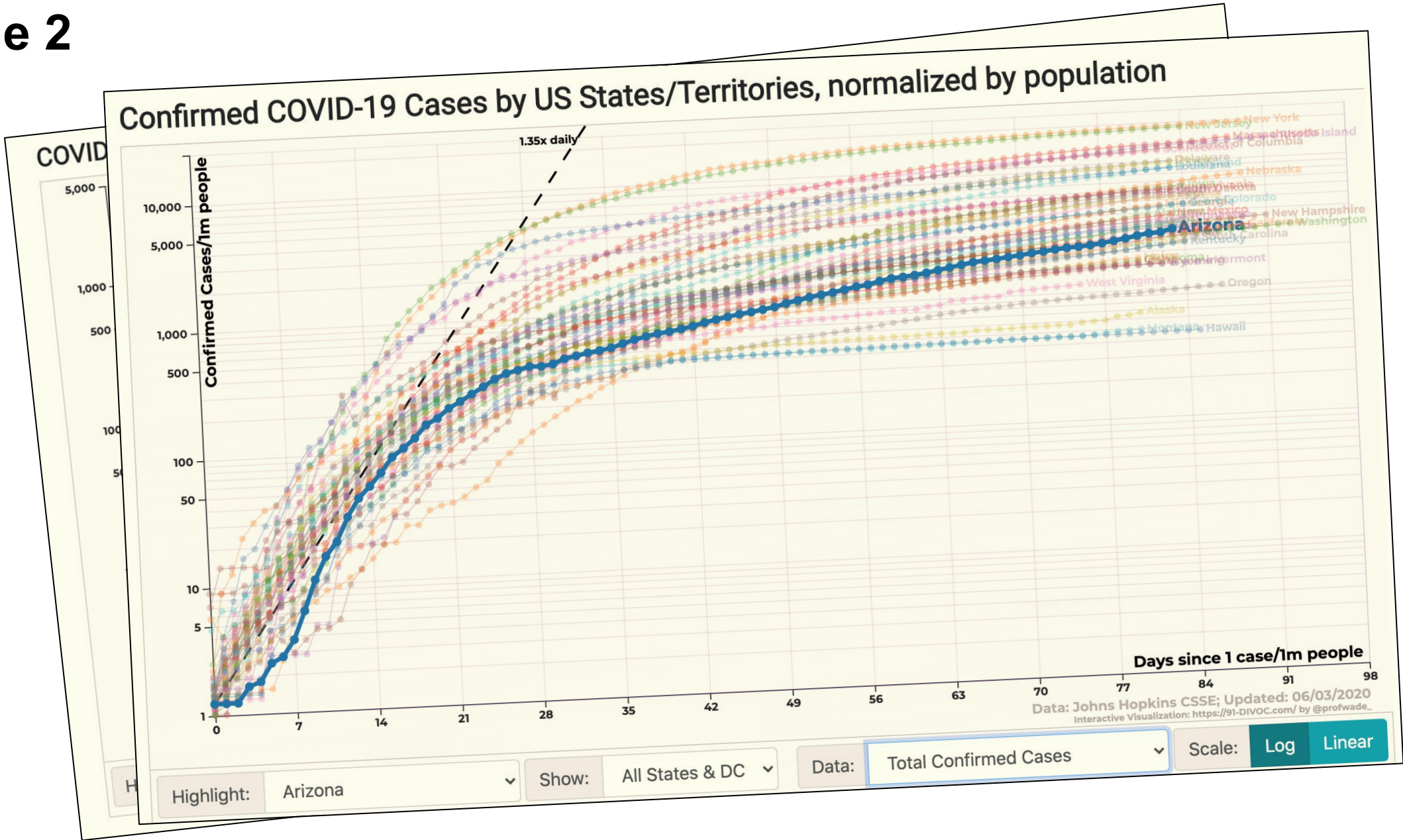
**Arizona State University**



# April 1

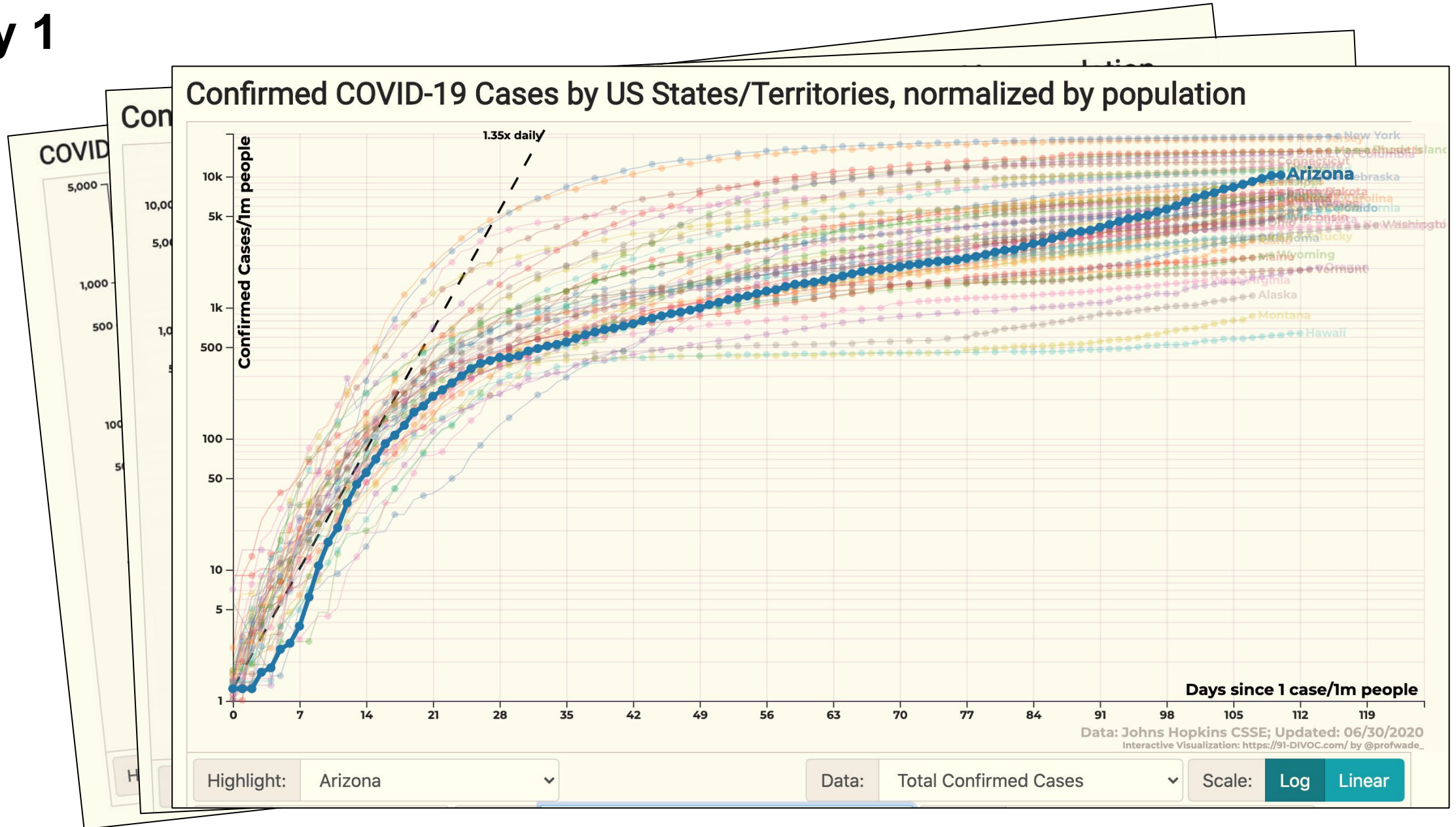


June 2



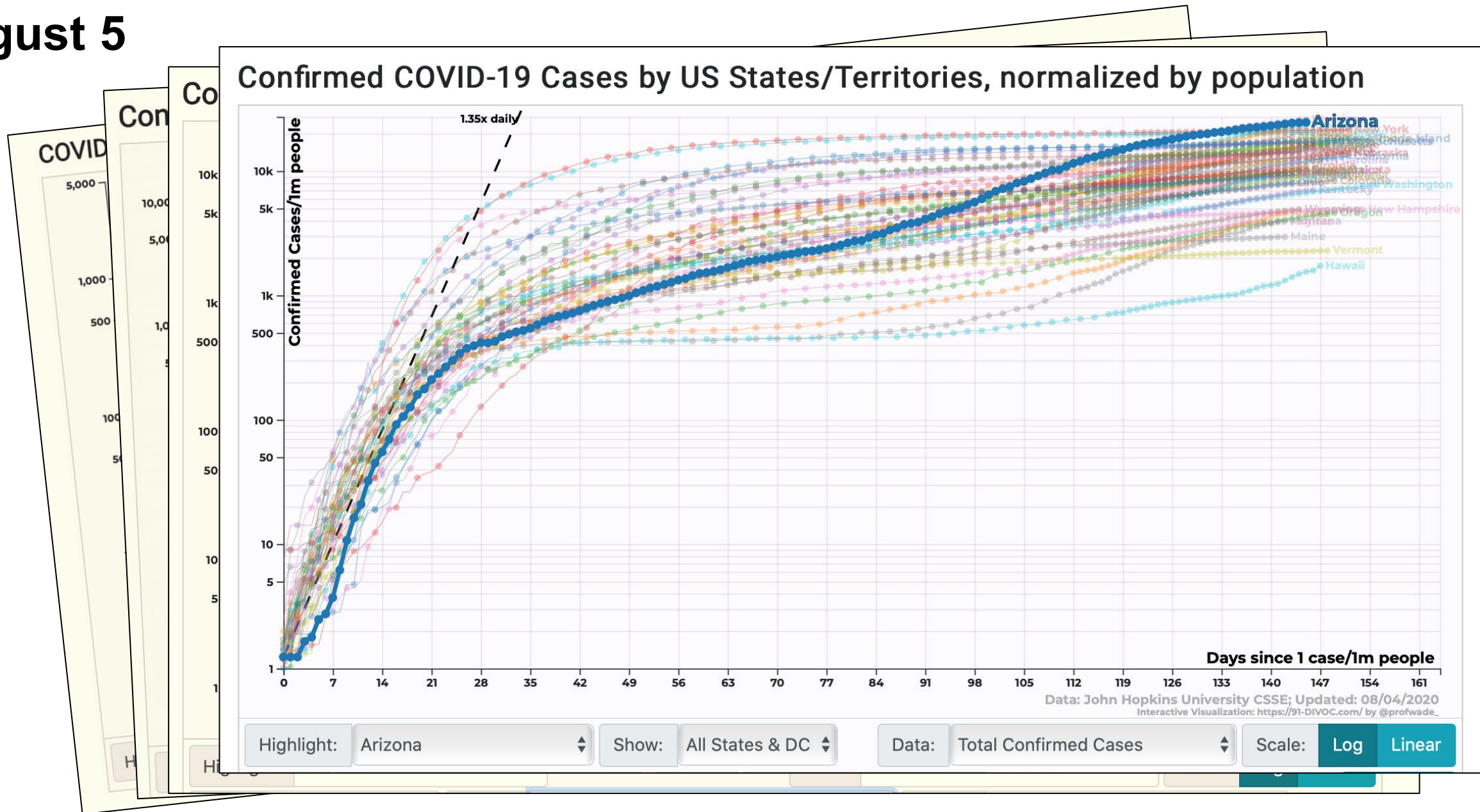


July 1





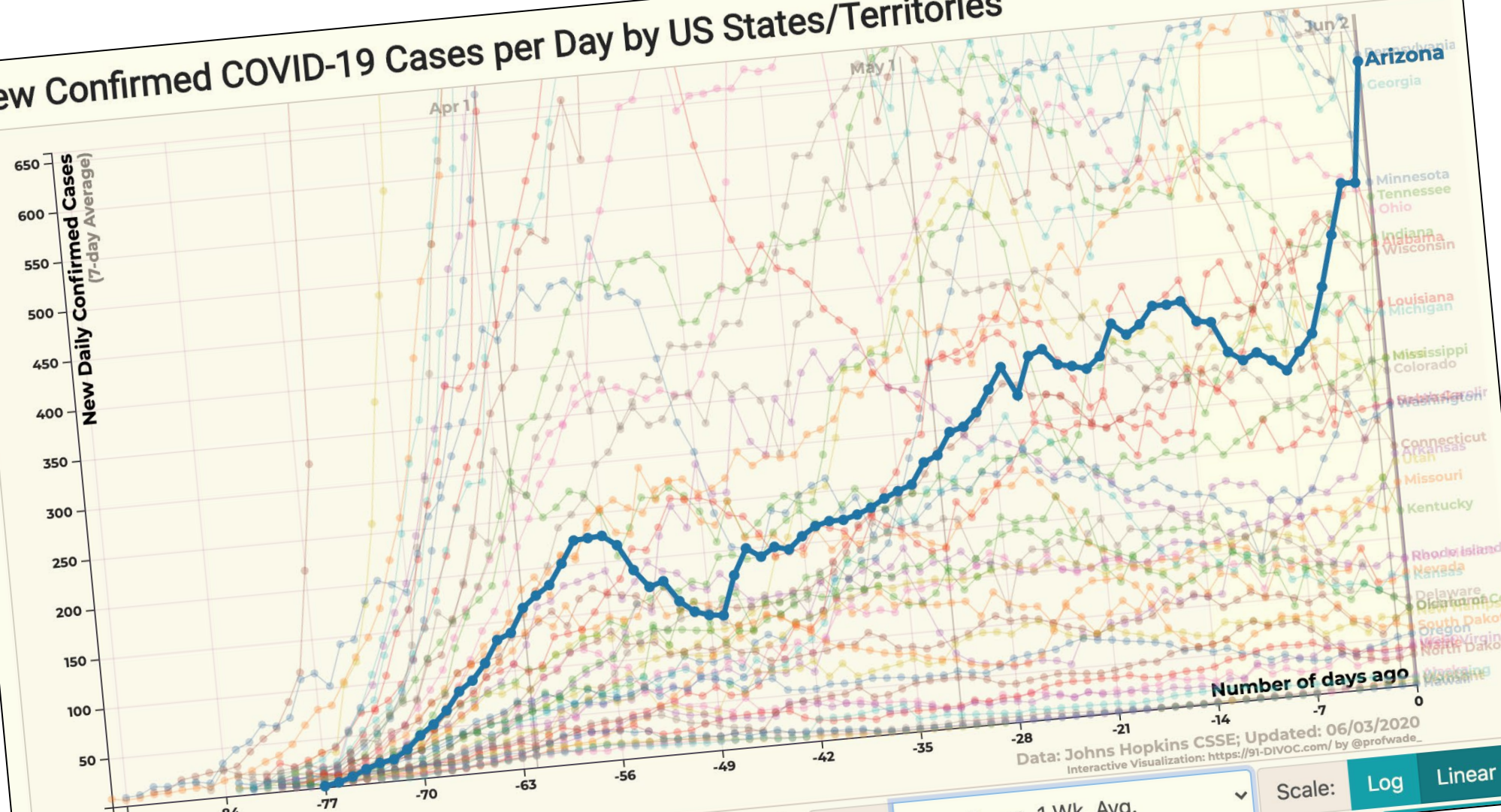
# August 5





June 2

# New Confirmed COVID-19 Cases per Day by US States/Territories



Data: Johns Hopkins CSSE; Updated: 06/03/2020  
Interactive Visualization: <https://91-DIVOC.com/> by @profwade\_

Highlight: Arizona

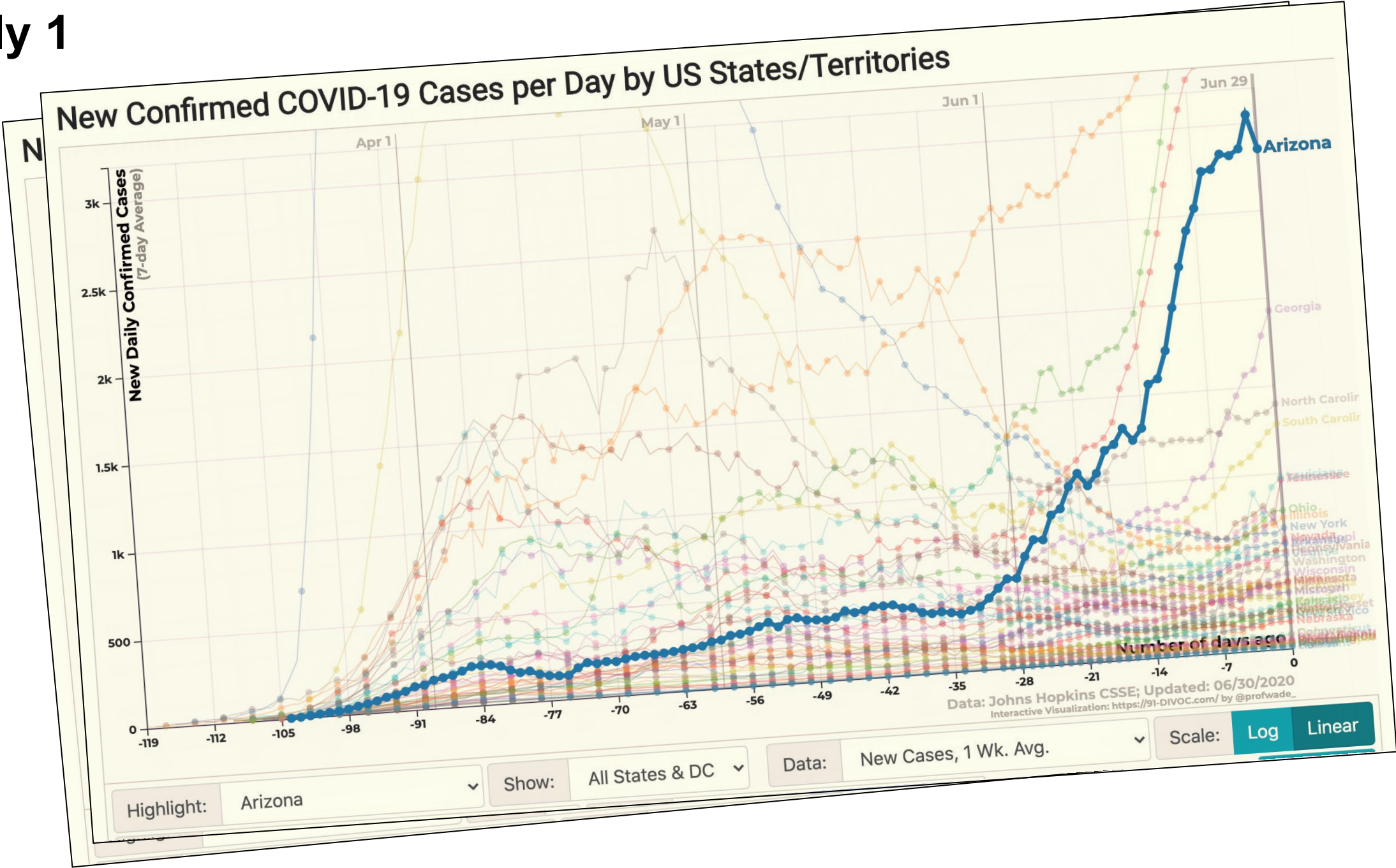
Show: All States & DC

Data: New Cases, 1 Wk. Avg.

Scale: Log Linear



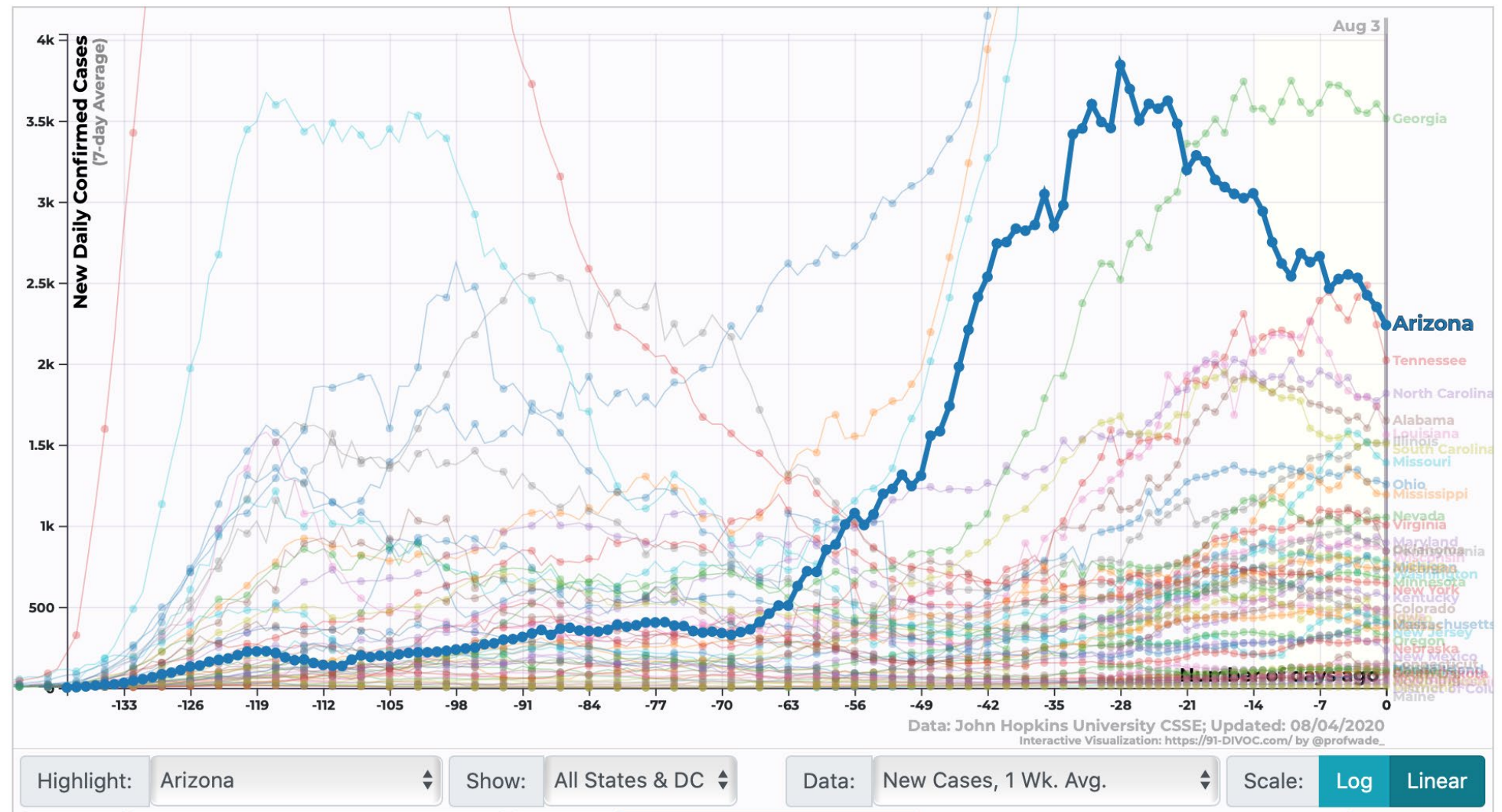
July 1





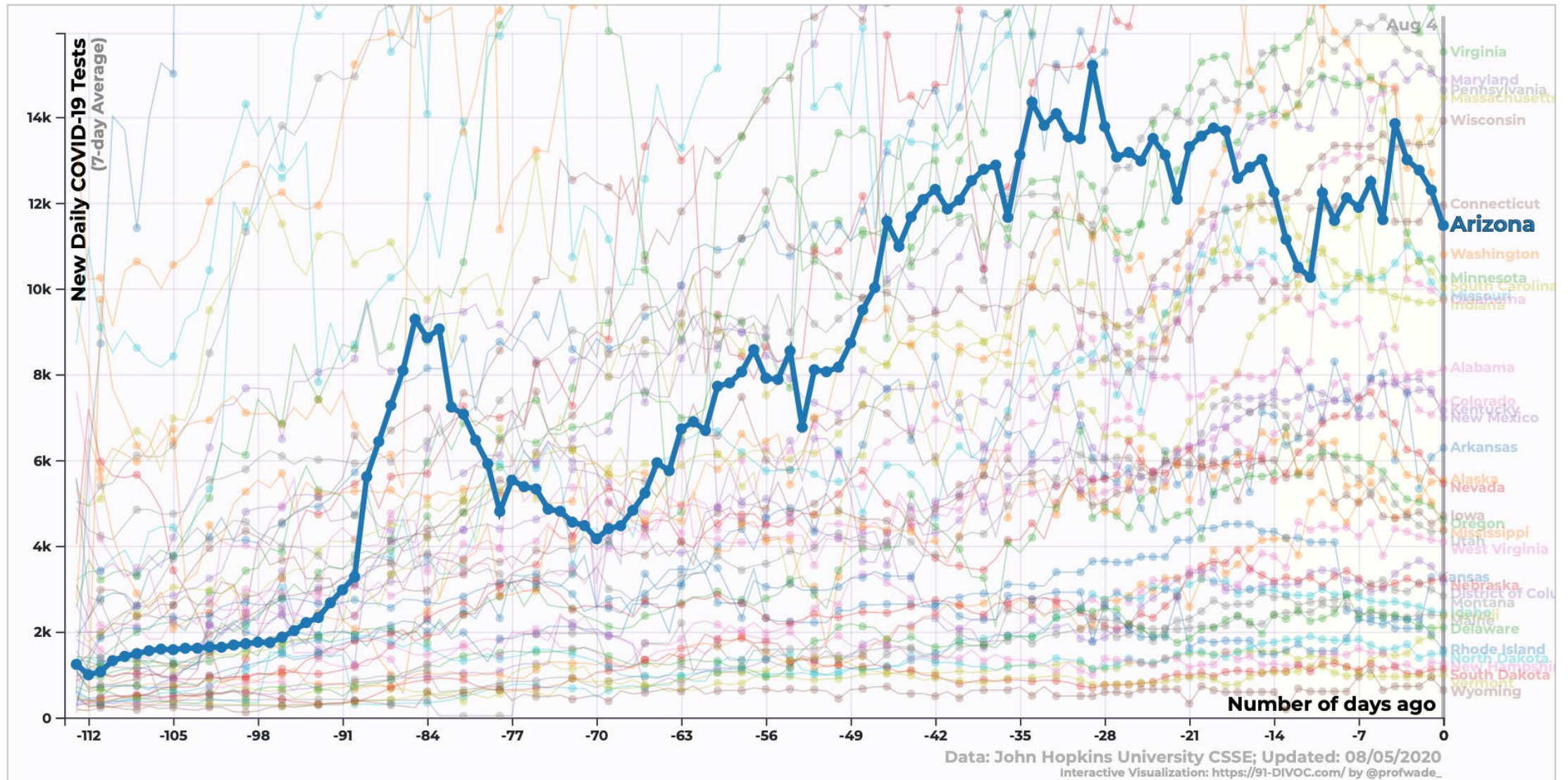
August 5

## New Confirmed COVID-19 Cases per Day by US States/Territories





# New COVID-19 Tests Performed per Day by US States/Territories



Highlight: Arizona

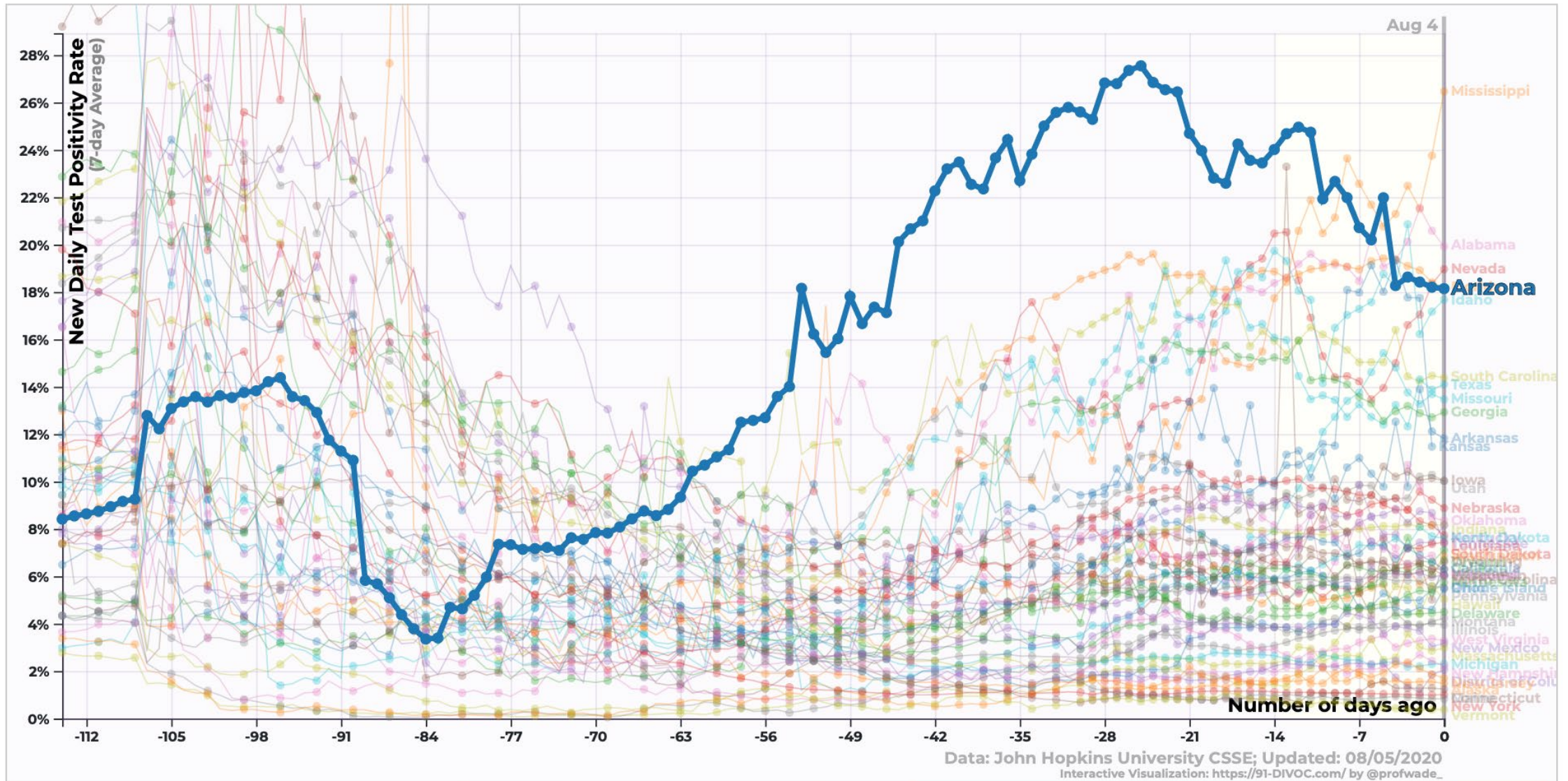
Show: All States & DC

Data: New Tests, 1 Wk. Avg.

Scale: Log Linear



# Daily COVID-19 Test Positivity Rate by US States/Territories



Highlight:

Arizona



Show:

All States & DC



Data:

Daily Test Positivity, 1 Wk. Avg.



Scale:

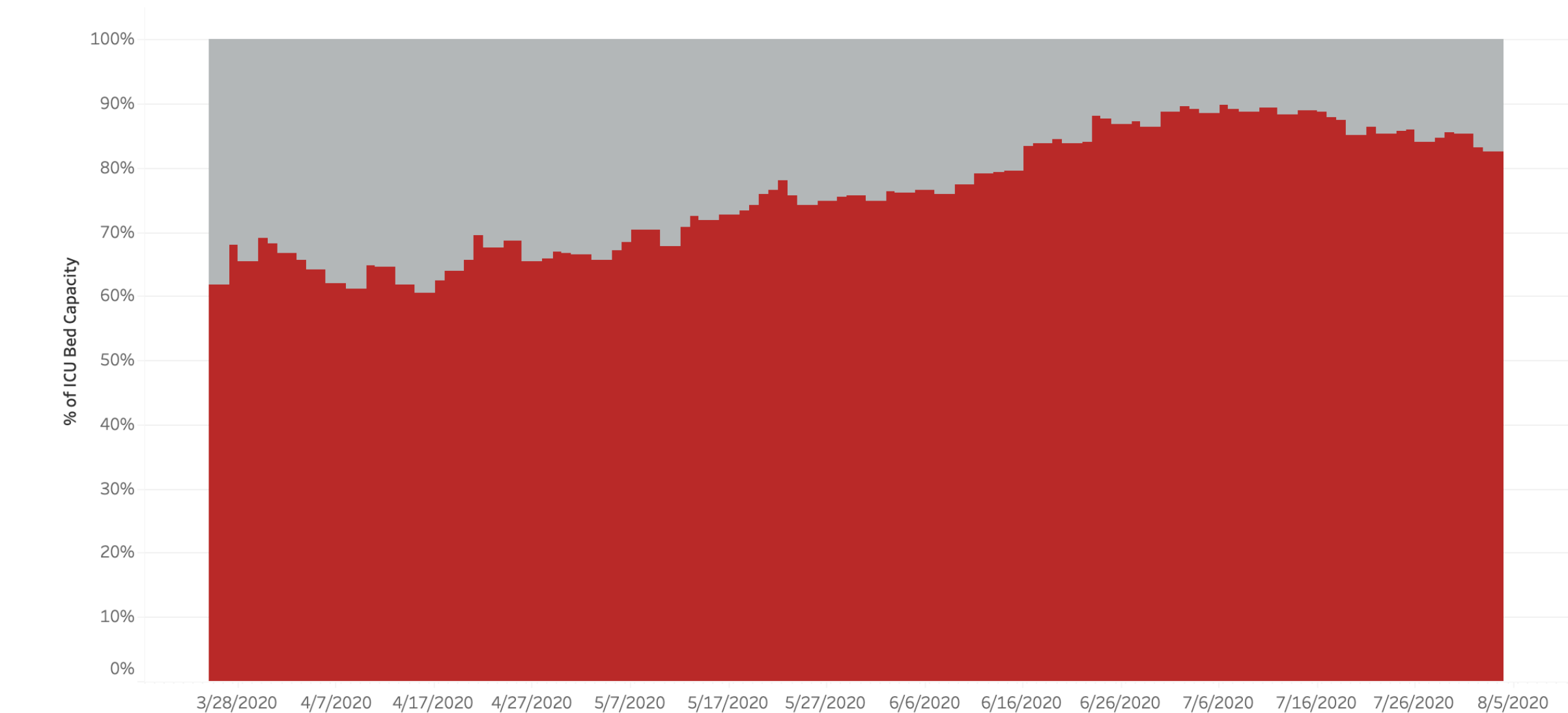
Log

Linear



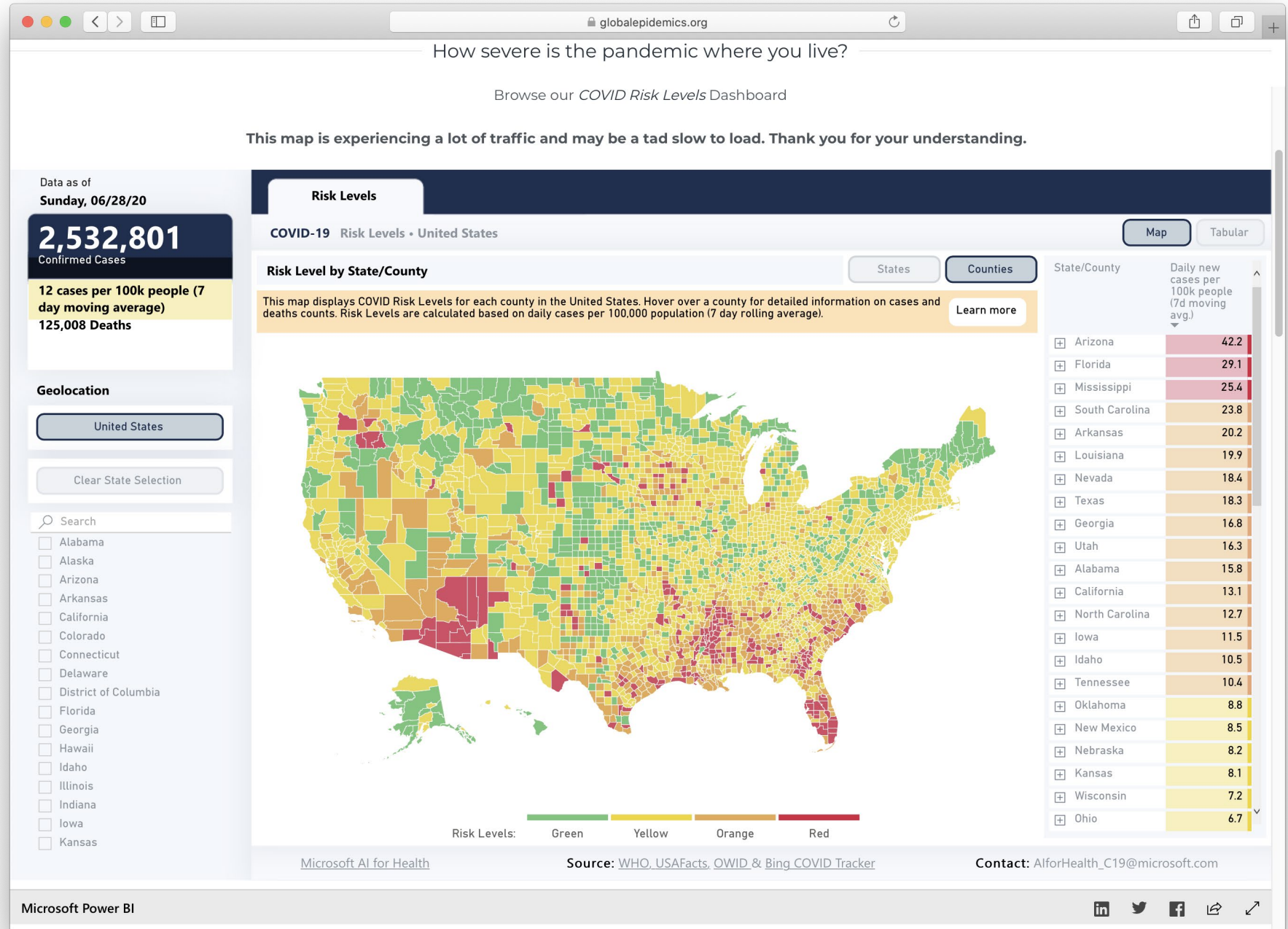
# Number of Intensive Care Unit (ICU) Beds Available and In Use at Arizona Hospitals

- Adult Intensive Care Unit Beds Available
- Adult Intensive Care Unit Beds In Use



# July 1:

## Arizona is #1 (but not for innovation)

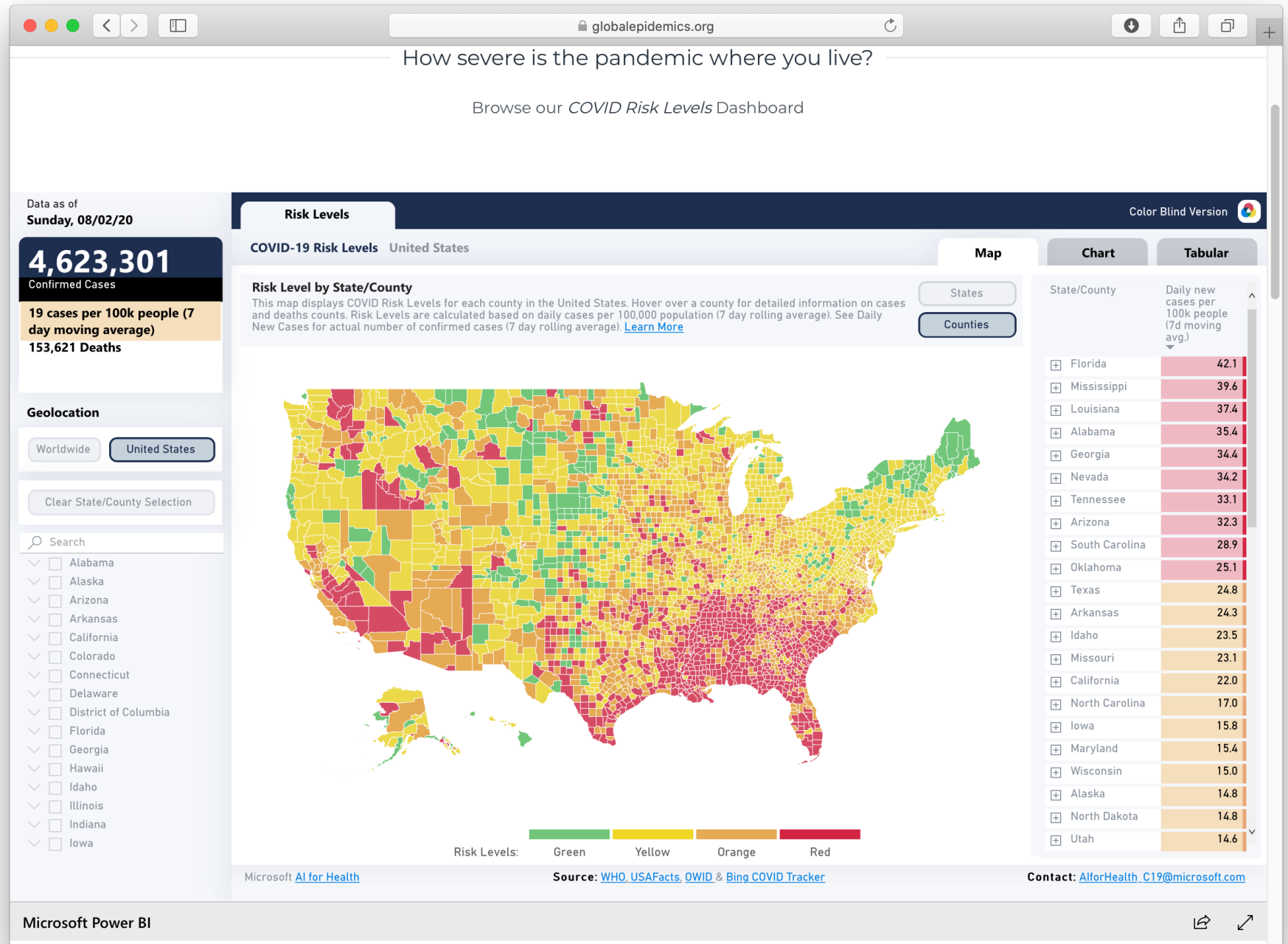


<https://globalepidemics.org/key-metrics-for-covid-suppression/>



# August 5:

## Arizona is #8



<https://globalepidemics.org/key-metrics-for-covid-suppression/>

# SARS-CoV-2 is Likely Airborne (as we've been saying)



The New York Times

PLAY THE CROSSWORD Account ▾

## Yes, the Coronavirus Is in the Air

Transmission through aerosols matters — and probably a lot more than we've been able to prove yet.

By Linsey C. Marr  
Dr. Marr is a professor of engineering.

July 30, 2020





A sneeze. And what it spreads. Just how much does the new coronavirus circulate in the tiny airborne aerosols we spew out simply by breathing? Bettmann, via Getty Images

Plus



nature



NEWS FEATURE · 08 JULY 2020

UPDATE 23 JULY 2020

## Mounting evidence suggests coronavirus is airborne — but health advice has not caught up

Governments are starting to change policies amid concerns that tiny droplets can carry SARS-CoV-2. And after months of denying the importance of this, the World Health Organization is reconsidering its stance.

Dyani Lewis



 PDF version

<https://www.nytimes.com/2020/07/30/opinion/coronavirus-aerosols.html>

<https://www.nature.com/articles/d41586-020-02058-1>





**MY MASK PROTECTS YOU, AND  
YOUR MASK PROTECTS ME.**



**Where are we headed?**







Optimist



Pessimist



Realist



Physicist



Surrealist



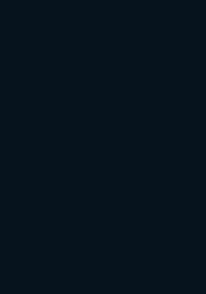
Relativist



Utopist

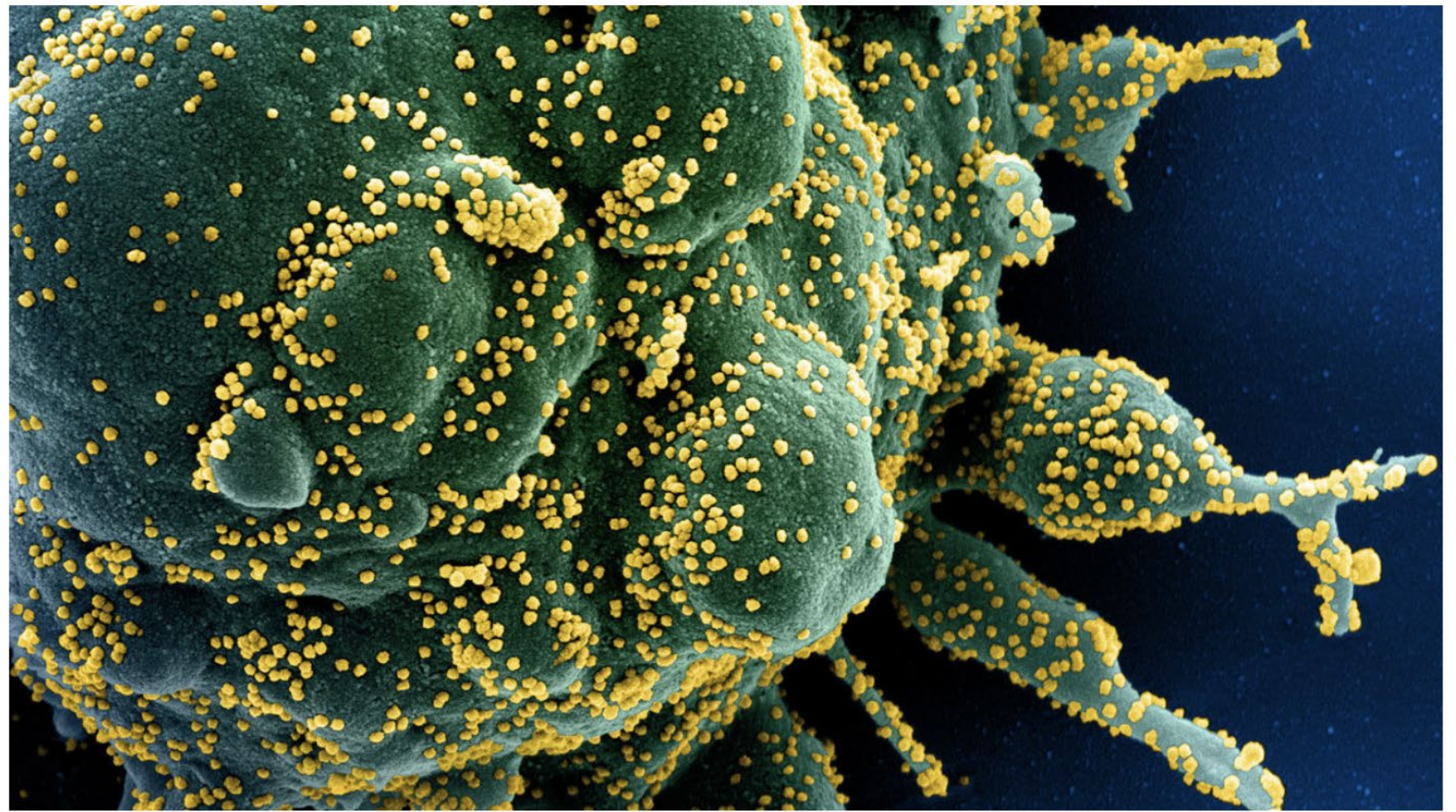


Scepticist



Nihilist

“Immune warriors known as T cells help us fight some viruses, but their importance for battling SARS-CoV-2, the virus that causes COVID-19, has been unclear. Now, two studies reveal infected people harbor T cells that target the virus—and may help them recover. Both studies also found some people never infected with SARS-CoV-2 have these cellular defenses, most likely because they were previously infected with other coronaviruses.”



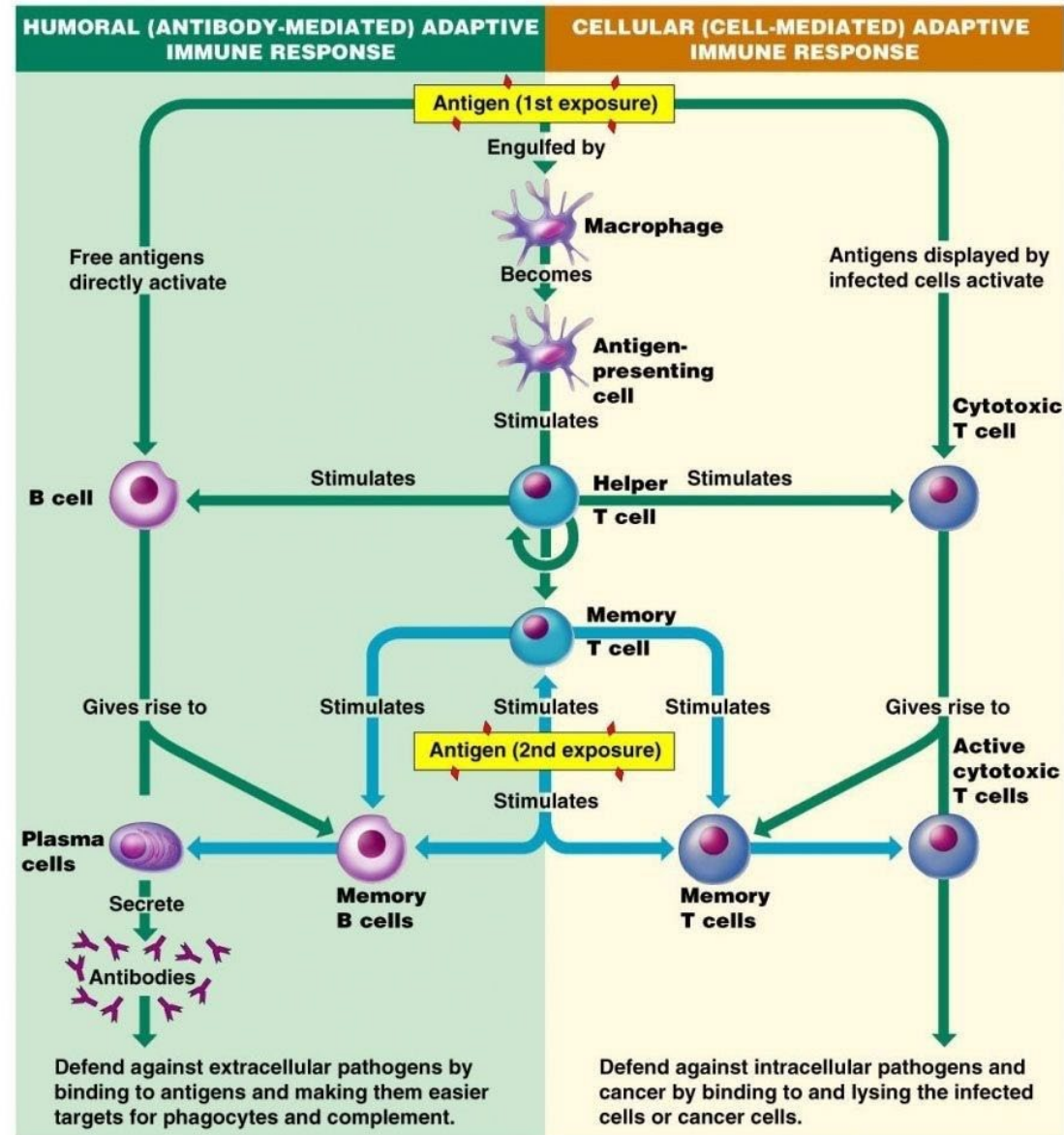
Immune hunters called T cells can seek and destroy a cell (green) infected with and making copies of SARS-CoV-2 (yellow). NIAID

## T cells found in COVID-19 patients ‘bode well’ for long-term immunity

By **Mitch Leslie** | May. 14, 2020 , 9:00 PM



# The Adaptive Immune System



**Antibody-Mediated:**

*Attack the pathogen*

**Cell-Mediated:**

*Attack the infected cells*

Comment | Published: 07 July 2020

## Pre-existing immunity to SARS-CoV-2: the knowns and unknowns

Alessandro Sette  & Shane Crotty 

*Nature Reviews Immunology* **20**, 457–458(2020) | [Cite this article](#)

**145k** Accesses | **1** Citations | **2932** Altmetric | [Metrics](#)

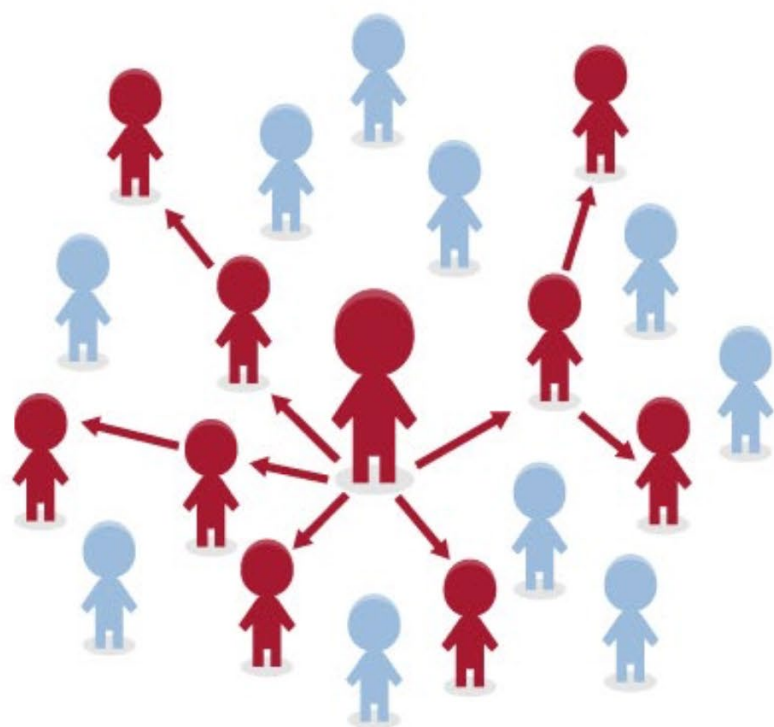
**T cell reactivity against SARS-CoV-2 was observed in unexposed people; however, the source and clinical relevance of the reactivity remains unknown. It is speculated that this reflects T cell memory to circulating ‘common cold’ coronaviruses. It will be important to define specificities of these T cells and assess their association with COVID-19 disease severity and vaccine responses.**

### If true, some possible implications:

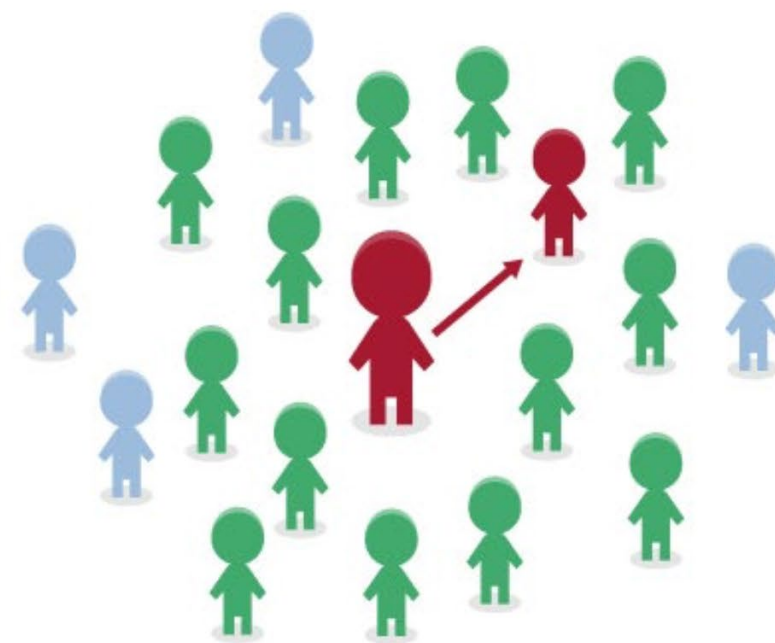
- May explain diverse disease outcomes
- Good news for vaccine development
- Closer to “herd immunity”?

<https://www.nature.com/articles/s41577-020-0389-z>





**No herd immunity**



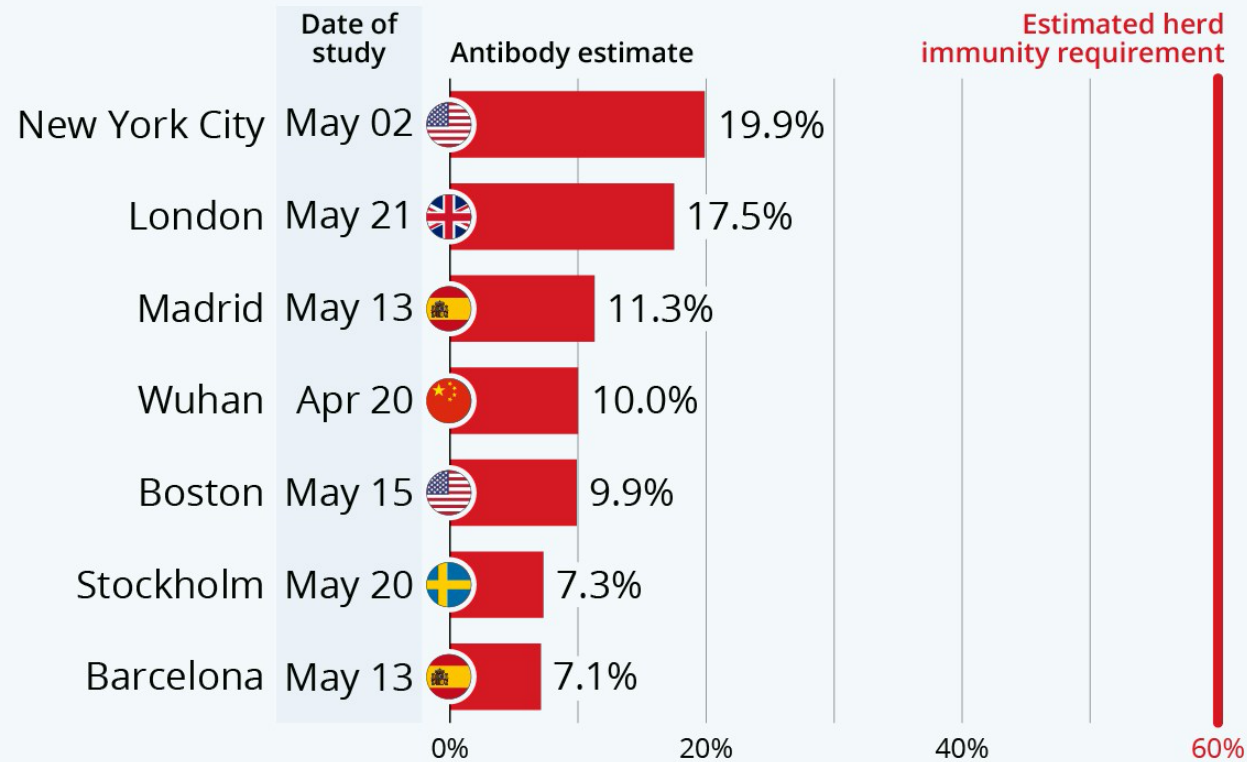
**Herd immunity achieved**

● Susceptible    ● Infected    ● Immune    → Disease transmission

Source: GAO adaptation of NIH graphic. | GAO-20-646SP

# COVID-19: How Far Away Are We From Herd Immunity?

Estimated share of the population with COVID-19 antibodies



Sources: Multiple studies via The New York Times





## Do some people have protection against the coronavirus?

By **Dr. Sanjay Gupta** and Andrea Kane, CNN

🕒 Updated 9:18 PM ET, Sun August 2, 2020

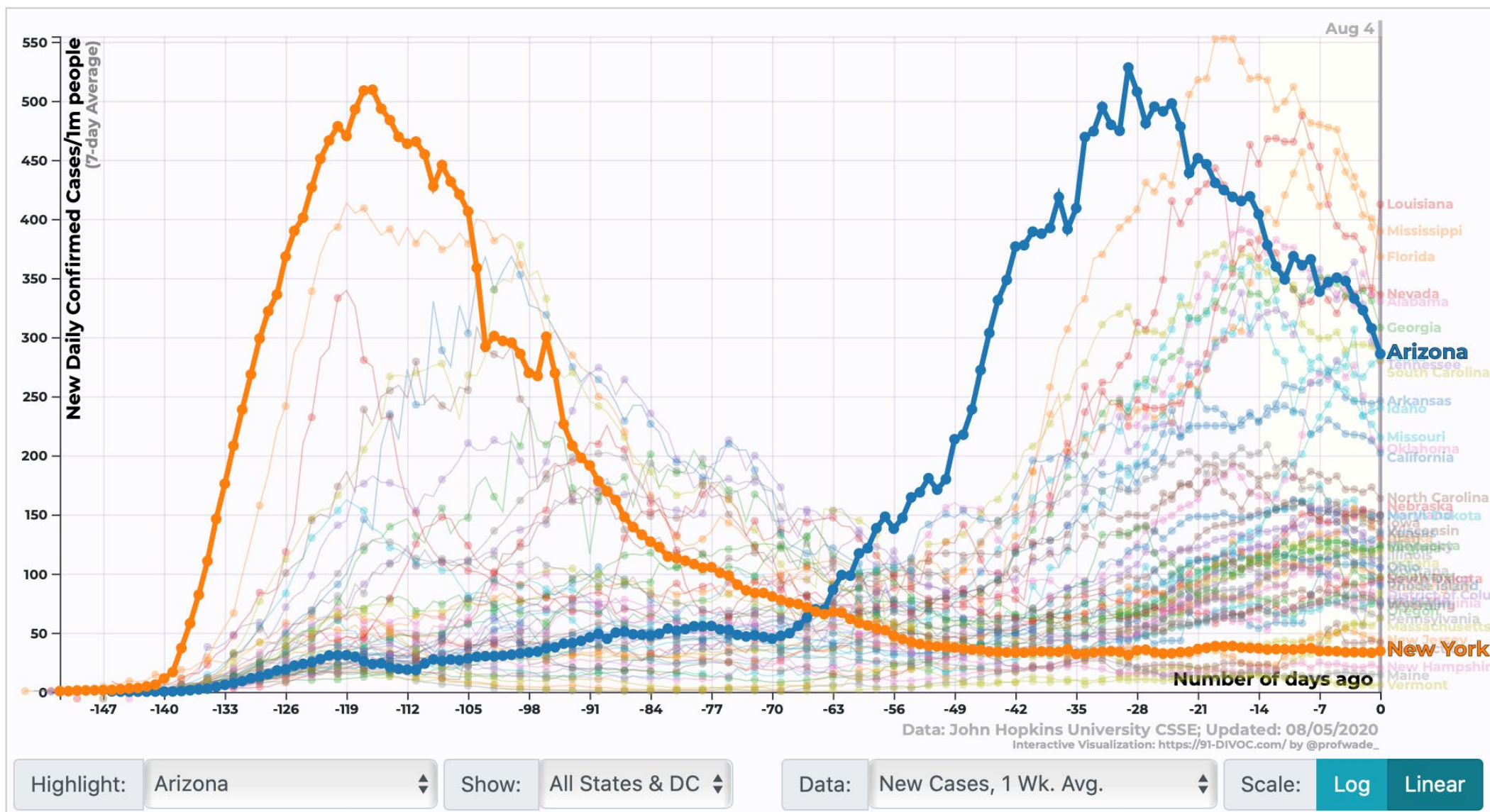
"For herd immunity, if indeed we have a very large proportion of the population already being immune in one way or another, through these cellular responses, they can count towards the pool that you need to establish herd immunity. If you have 50% already in a way immune, because of these existing immune responses, then you don't need 60 to 80%, you need 10 to 30% -- you have covered the 50% already. The implications of having some pre-existing immunity suggests that maybe you need a small proportion of the population to be impacted before the epidemic wave dies out," said Dr. John Ioannidis, a professor of medicine and epidemiology and population health at Stanford University.

<https://www.cnn.com/2020/08/02/health/gupta-coronavirus-t-cell-cross-reactivity-immunity-wellness/index.html>



***Caveat emptor:***  
Ioannidis has been arguing since March that we may be over-reacting in advance of good data. Not unbiased. Still...

# New Confirmed COVID-19 Cases per Day by US States/Territories, normalized by population







SESE Community Conversation: 5 August 2020



# News/SESE Leadership



**Meenakshi Wadhwa**

**Director**

Meenakshi Wadhwa is the Director of the School of Earth and Space Exploration.

Her research focuses on isotope cosmochemistry, in particular the sources and distributions of extinct radionuclides in the solar nebula; the formation and evolution of crust-mantle reservoirs on Earth, Moon and Mars; and the abundance and origin of water and other volatiles on rocky bodies in the solar system.



**Ramon Arrowsmith**

**Associate Director of Operations**

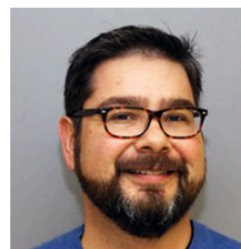
Ramon Arrowsmith studies active faulting, earthquake geology, tectonic geomorphology, and the geologic framework for human origins. Dr. Arrowsmith teaches Field Geology, Structural Geology, Geomorphology, and Computers in Earth and Space Exploration.



**Hilairy Hartnett**

**Associate Director of Graduate Initiatives**

Hilairy Hartnett has joint appointments in the School of Earth and Space Exploration and in the School of Molecular Sciences. Her current research interests are in the areas of biogeochemistry and organic geochemistry and focus on how geochemical, microbial, and anthropogenic processes affect the dynamic linked elemental cycles in modern, and paleo-environments.



**Chris Groppi**

**Associate Director of Undergraduate Initiatives**

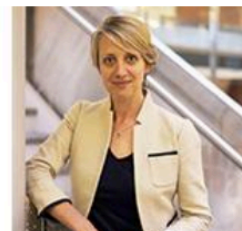
Christopher Groppi is an experimental astrophysicist interested in the process of star and planet formation and the evolution and structure of the interstellar medium. His current research focuses on the design and construction of state of the art terahertz receiver systems optimized to detect the light emitted by molecules and atoms in molecular clouds, the birthplace of stars.



**Patrick Young**

**Associate Director of Community Outreach**

Patrick Young is a theoretical astrophysicist interested in the lives and deaths of stars and their effects on their environments, from synthesis of the chemical elements to planetary habitability. His current research touches on computational hydrodynamics simulations of stellar interiors, supernovae and gamma-ray bursts and the synthesis and ejection of elements by nuclear fusion in stars and stellar explosions. He also models the evolution of stars and how their radiation, winds, and stellar activity may affect the habitability of nearby planets.



**Christy Till**

**Associate Director for an Inclusive Community**

Christy Till is a geologist who teaches classes and leads a multidisciplinary research program on the role of magma in the formation and evolution of planets, known as the E.P.I.C. lab. E.P.I.C. lab research includes determining the timescales and triggers for eruptions at active volcanoes in the US, growing minerals and magma in high pressure and temperature laboratory experiments, and studying the likely compositions of magma and crusts on exoplanets. Dr. Till also has deep interests in working for justice, equity, diversity, and inclusion in academic science and improving science communication.



# News/SESE Leadership

Prof. Christy Till appointed to new AD position for Inclusive Community:

- In process of establishing a SESE JEDI Task Force; will include undergrads, grads, postdocs, researchers, staff, & faculty
- Developing a code of conduct for our community members
- Hoping to facilitate a site visit over the coming year to review SESE climate and culture, structures, and policies (most likely AAS Climate Assessment Site Visit program)
- Looking into establishing self-sustaining trainings for our community
- Establishing a small grants program to empower our community members to facilitate JEDI
- Prof. Till will hold regular office hours once the Fall semester starts

# News/New personnel joining SESE: WELCOME!!

- Katrina Bossert, Assistant Professor (Space Physics, Heliophysics) in SESE and SoMSS (Aug 10)
- Grayson Boyer, Assistant Research Scientist
- Timothy Carleton, Postdoctoral Research Scholar
- Collin Engelson, Academic Facilities Specialist
- Ryan Fagan, Engineer Associate
- Bruce Feldhusen, Senior Building Automation Systems Manager
- Cameron Harris, Research Technician
- Zehra Hodzic, Program Aide
- Jessica Jenner, Academic Success Advisor (online programs) (Aug 10)
- Byeongkwan Ko, Postdoctoral Research Scholar
- Carly Kramer, Communications Specialist Associate
- Luke Shaffer, Computer Programmer Assistant
- Luiza Teophilo Aparecido, Postdoctoral Research Scholar



# News/Communications: On campus presence

## Plans for broader re-opening

- Email sent to SESEALL list yesterday describing our plans for Fall
- Remote work to continue, but up to ~30% occupancy now allowed in SESE buildings which have been readied (signage, cleaning schedule)
- “Community of Care” safety training for all coming back to campus; additional supervisor training for faculty and staff
- Face coverings are REQUIRED at all times in SESE buildings. PPE (face coverings), hand sanitizer, disinfectant provided centrally (contact: Marc Biren)
- Testing is starting to occur for ASU employees; registration required (<https://cfo.asu.edu/employee-testing>)

# News/Communications: On campus presence

Plans for broader re-opening (cont.)

- Email sent to SESEALL list yesterday describing our plans for Fall
- Some of our HQ staff and SESE Leadership will be back on a staggered schedule starting Thursday, Aug 6.
  - Staff representing BO-HR-RA-AP will be in office Tuesdays-Thursdays from 8 AM to 2 PM
  - Mondays and Fridays will have reception and mail service
- SESE HQ in ISTB4 will be staffed as above, SESE HQ in PSF will not be staffed. Both will be accessible via key card/key access



# News/Communications: Teaching

## Plans for Fall 2020

- All classes will be taught in ASU Sync mode (synchronous teaching via Zoom, with some in-class component for limited numbers of students allowing transition to full remote teaching if that becomes necessary)
- All courses with >100 anticipated enrollment and all lab courses will be in remote mode only
- For all other ASU Sync courses, students have the option to be on campus or in remote mode; instructors in communication with enrolled students to manage this
- Classrooms outfitted centrally – different levels – through ASU with additional technology/tools (fixed or portable kits) to allow the above

# News/Communications: Budget & Finances

- Enrollments continue to increase for the Fall (but lower than this time last year)
  - Overall enrollment in SESE courses (5880) is down by ~4% relative to this time last year (was -6% 2 weeks ago)
- Significant uncertainties for international and out-of-state students
- Full financial picture will remain uncertain till the 21<sup>st</sup> day of the Fall semester
- We were asked to plan for a significant cut (~\$300K) to our total annual budget – expect to receive definitive target this week



# News/Communications: Fall Activities

Community activities during Fall 2020:

- SESE Community Conversations (first week of September, October, November, December; day/time TBD)
- SESE Colloquium (Wednesdays, 3:30-4:30 PM, weekly)
- Virtual Tea (Thursdays, 3:00-4:00 PM, weekly)
- Engineering Coffee (Fridays, 2:30-3:30 PM, weekly)
- Open listening sessions with SESE leadership (weekly, 9-10 AM Tuesdays)
- Office hours with the director (weekly, 8-10 AM Fridays)

**Welcome to the Fall 2020 semester:  
Let's help to keep each other safe and productive!**