



COVID-19: The Update

March 30, 2021

Dave Engelthaler, PhD, MS

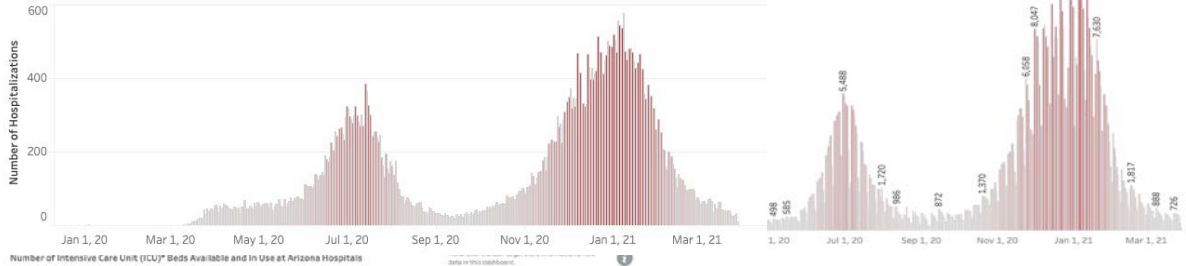
Director, TGen North

Translational Genomics Research Institute

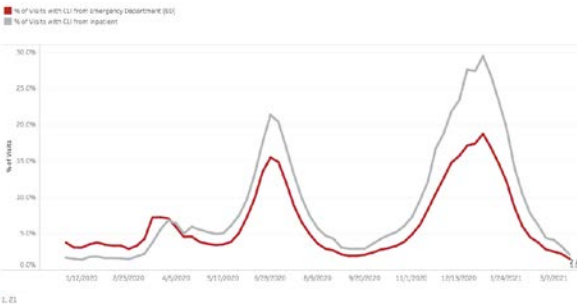
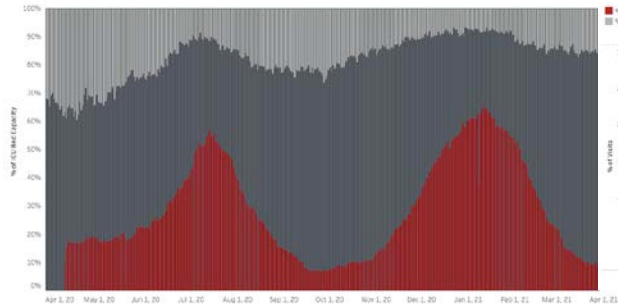
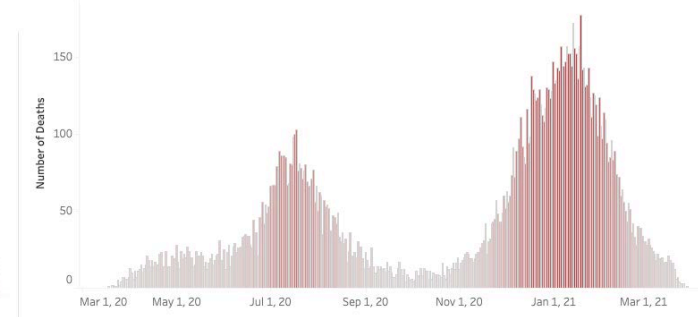
The State of COVID – March 30, 2021



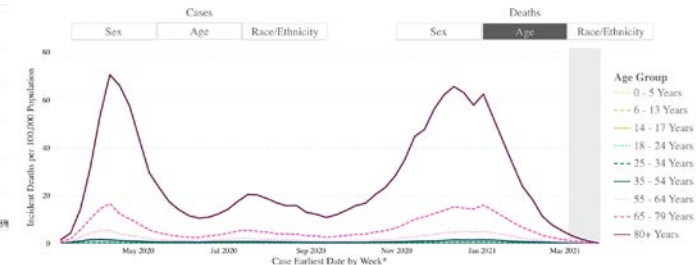
Number of COVID-19 Cases that are Hospitalized by Date of Hospitalization



COVID-19 Deaths by Date of Death



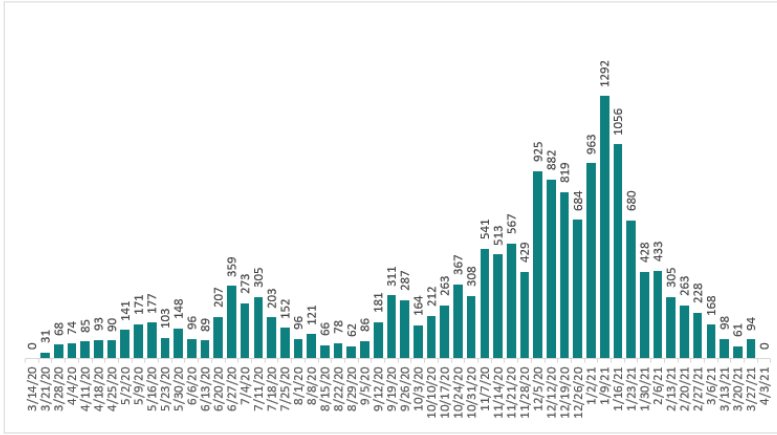
COVID-19 Weekly Deaths per 100,000 Population by Age Group, United States
March 1, 2020 - March 25, 2021



The County View



Coconino County COVID-19 Weekly Cases

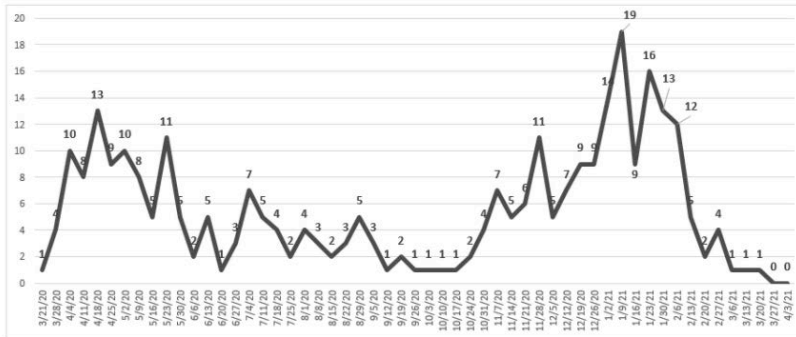


Showing data for **Coconino County**

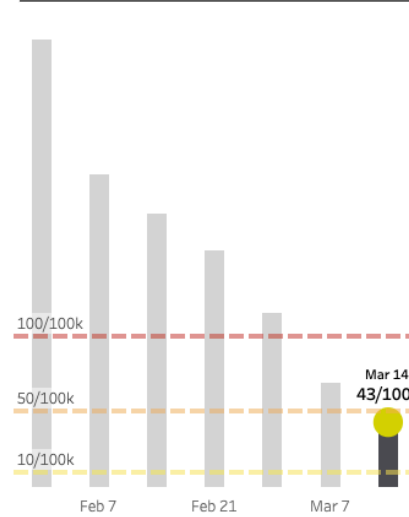
Moderate Transmission

Hover for more information.

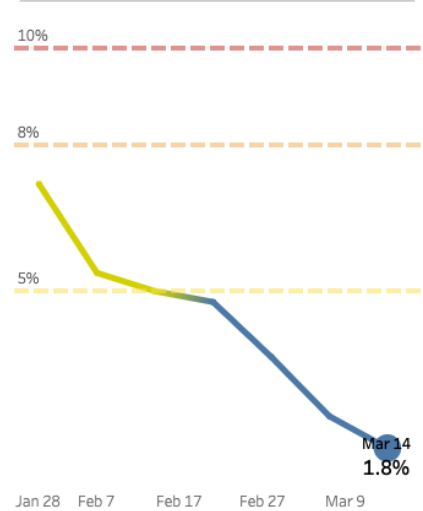
Coconino County COVID-19 Deaths per Week



Cases per 100,000 individuals: **Moderate**



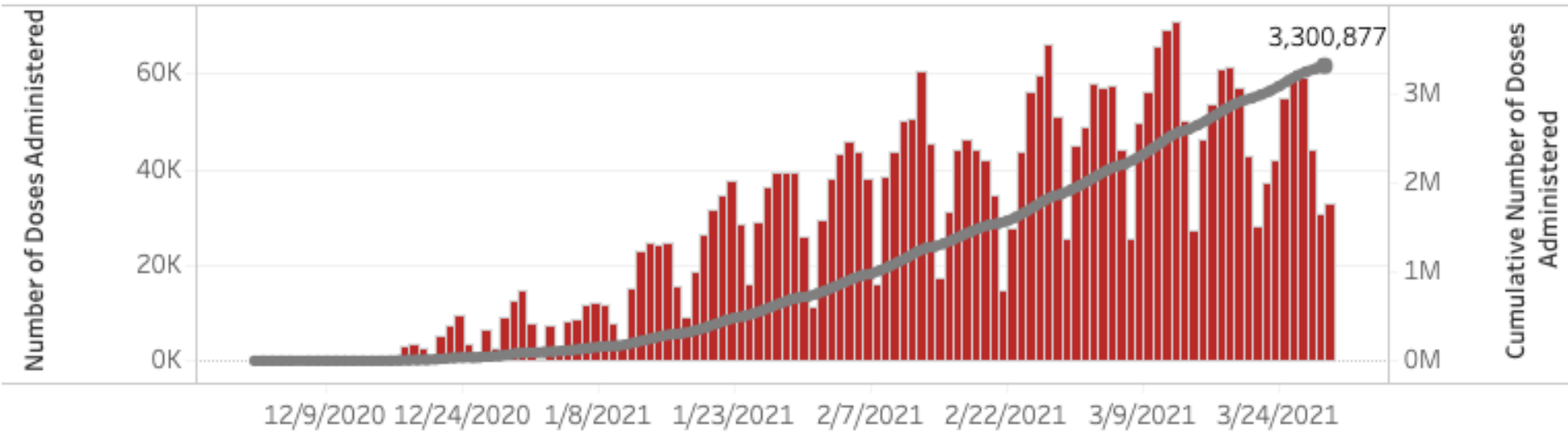
Percent positivity: **Low**



AZ Vaccine and Community Immunity – Almost There



The number of doses administered by administration date (■ cumulative sum ■ doses by day)



Full Dose = 1.3M X 95% effect = 1.2M

One Dose = 0.8M X 80% effect = 0.6M

Total with Vaccine Immunity = 1.8M

AZ Population >17 = 5.3M

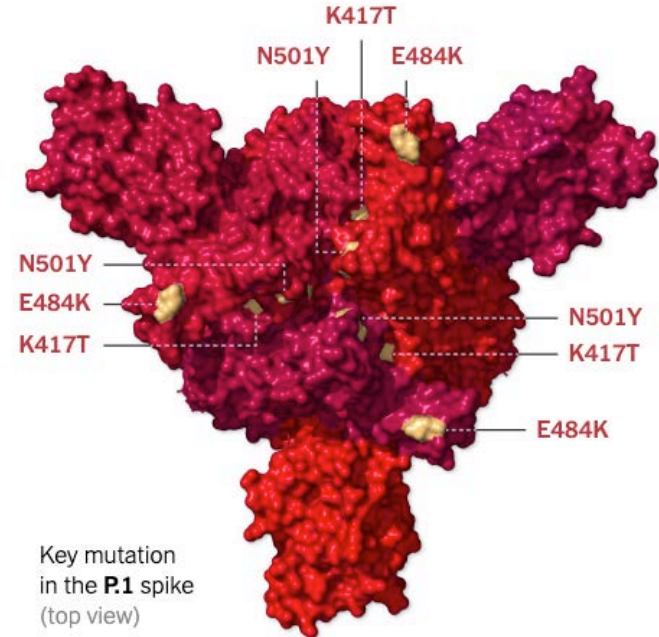
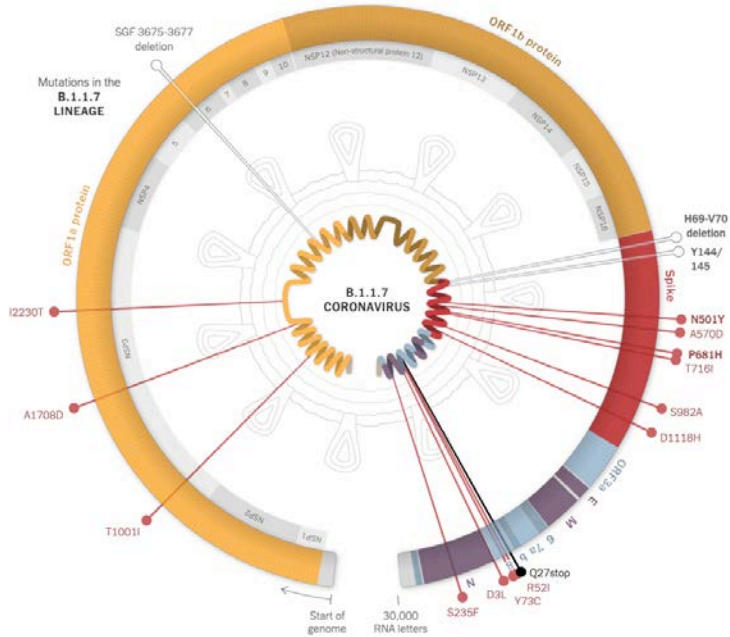
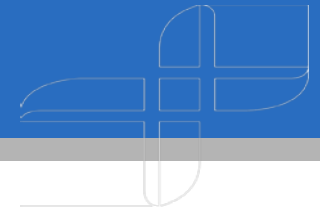
Cases = 0.84M X 2 = 1.68M

1.68M X 90% effect = 1.5M Case Immunity

Total Vaccine & Case Immunity = 3.3M

3.3M/5.3M = 60% Immunity

But what about the Variants?



AZ – COVID Genomics Tracking Dashboard

(<https://pathogen.tgen.org/covidseq-tracker/>)



Arizona COVID-19 Sequencing Dashboard

Total Genomes: 10,905

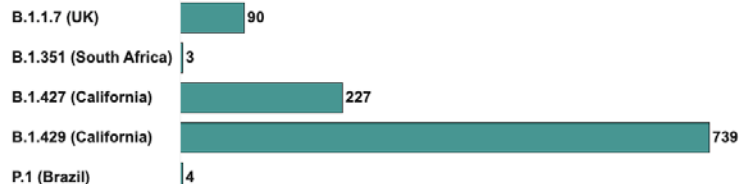
Number of Genomes Since January 1, 2021: 3,493

Hover over the bars to view proportions.

Variants of Concern (VOC)

Number of Genomes Sequenced December - Present

Variant Name (Origin)



Variants of Interest (VOI)

Number of Genomes Sequenced December - Present

Variant Name (Origin)



Mutations of Interest

Number of Genomes Sequenced December - Present

Mutation



Description of Mutations of Interest

The mutations shown on the graph to the left are all in the "S" or spike protein of SARS-CoV-2.

The 501Y mutation has been associated with increased ACE2 receptor binding.

The 484K mutation has been associated with reduced antibody binding and immune escape.

The 452R mutation has been associated with increased transmissibility, infectivity, and potentially impacts effectiveness of some clinical treatments.

The 417N/T mutation has been associated with immune evasion.

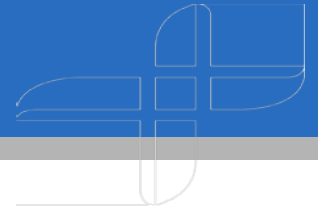
The VOC/VOI displayed are reflective of CDC's new SARS-CoV-2 variant classification scheme. <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/variant-info.html>. These variants and mutations have been associated with increased transmission, increased severity of illness, and natural or vaccine-induced immune escape. These sequences may not represent the true prevalence of the variants or mutations in the population.

Data displayed are from sequencing conducted by TGen North, Arizona State Public Health Laboratory, Centers for Disease Control, Arizona State University, University of Arizona, U.S. Air Force and Quest Diagnostics. Enabled, in part, by data made available from GISAID.



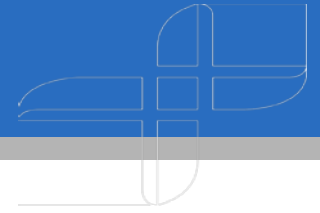
Updated 03/29/2021

Science and Humanity



- “Use science neither as a punchline nor as a weapon, but rather as a tool to illuminate the best way to serve humanity”
- We are getting to the end of the Pandemic ...
 -We need to start thinking how to act like it
- We need another month to ensure the numbers stay low and everyone who wants a vaccine can get it ... especially the vulnerable
- Accept that there will still be risk – virus won’t go away
- Accept that people will still be afraid/concerned – fear won’t immediately go away
- We should neither “mask-shame” or “vax-shame”
 - People will make their own choices ... and that’s okay
- Long Haul COVID is a real thing, so is the Post-COVID Mental Health Challenge

The Other Impacts COVID-19 Impacts



- Mental health pandemic will lead to prolonged mistrust and substance abuse
- Business changes and business closures will prevent many from getting back to the workforce – unemployment, homelessness
- Greater use of technology may make big cities less relevant, except to house unemployed and impoverished – small towns will absorb
- Governments have stronger capacity for surveillance
- Trust in science is lower in many and is more like religion for others
- Elder-care and public health will no longer be ignored

Still all in this together ...

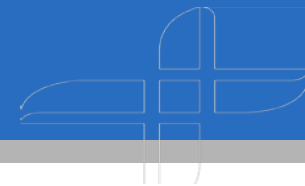


There's no question of heroism in all this. It's a matter of common decency. That's an idea which may make some people smile, but the only means of fighting a plague is — common decency."

A. Camus *The Plague*



The TGen COVID Funding Partners



Ben and Catherine
Ivy Foundation



VIRGINIA G.
PIPER
CHARITABLE TRUST



GarciaFamilyfoundation



ARIZONA DEPARTMENT
OF HEALTH SERVICES

Jeffrey M. Trent, Ph.D., F.A.C.M.G.
President and Research Director
The Translational Genomics Research Institute
602.343.8419 • jtrent@tgen.org

David Engelthaler, Ph.D.
Associate Professor and Co-Director
Pathogen and Microbiome Division, TGen North
928.226.6356 • dengelthaler@tgen.org

