

COVID-19 Disease Outbreak Outlook

Arizona State and Pima County

Updated May 22, 2020

Disclaimer: This information represents my personal views and not those of The University of Arizona, the Zuckerman College of Public Health, or any other government entity. Any opinions, forecasts, or recommendations should be considered in conjunction with other corroborating and conflicting data.

For the week ending Sunday, May 17, weekly case counts aggregated by test collection date show the number of newly diagnosed cases in Arizona declined from the prior week (Figure 1). While a welcomed signal of improvement, increased testing makes it difficult to judge how the decline in case counts correlates with underlying trends in viral transmission. These data also precede any potential impact from the May 15 expiration of Arizona’s “stay at-home” order.

For the week ending May 17, 40757 individuals provided 49365 PCR samples of which 5.4% were positive (Figure 2, Panel A). In addition, 22692 individuals provided 31615 serology samples of which 3.1% were positive (Figure 2, Panel B). The serology results likely represent an upper bound of state-wide prevalence.

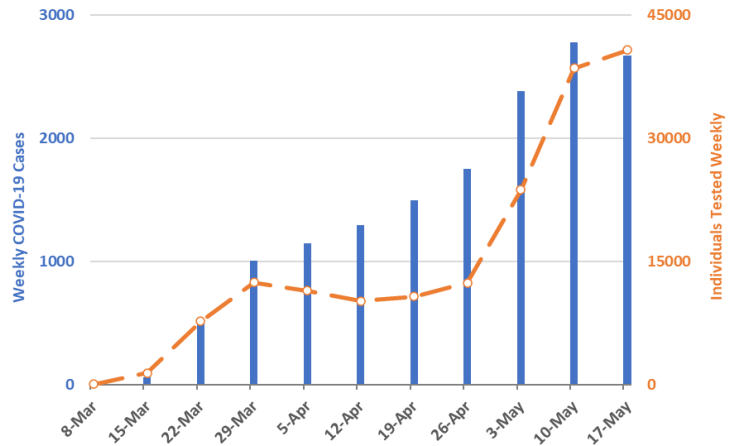


Figure 1. Newly Diagnosed COVID-19 Cases in Arizona and Number of Individuals Tested through May 17

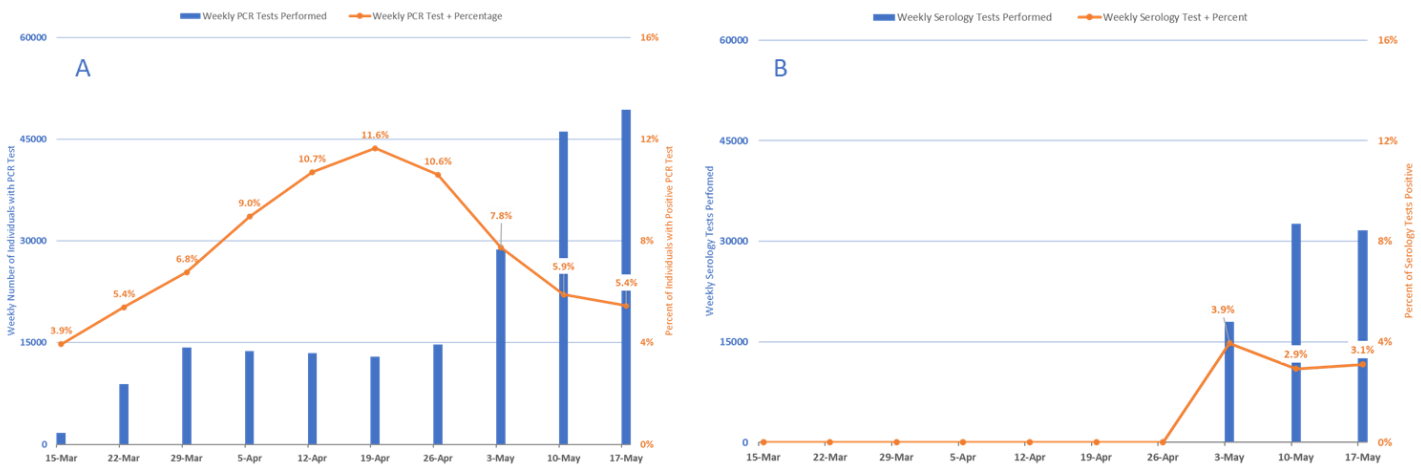


Figure 2. Weekly PCR (Panel A) and Serology (Panel B) Test Performed in Arizona through May 17

As of May 22, 775 deaths have been announced in Arizona; however, reporting lag makes it difficult to interpret these counts in real-time. For example, ADHS announced 144 new deaths during the week ending May 17, but only 55 of these deaths occurred during this period (Figure 3). The week ending May 10 is the first to clearly show the impact of ADHS’s new practice of using case tracking and [death certificate data](#) to identify total deaths. Even with a 1 – 3 week lag in reporting and verification, deaths appear to be slowly increasing with the largest number of deaths (124) occurring the week ending May 10.

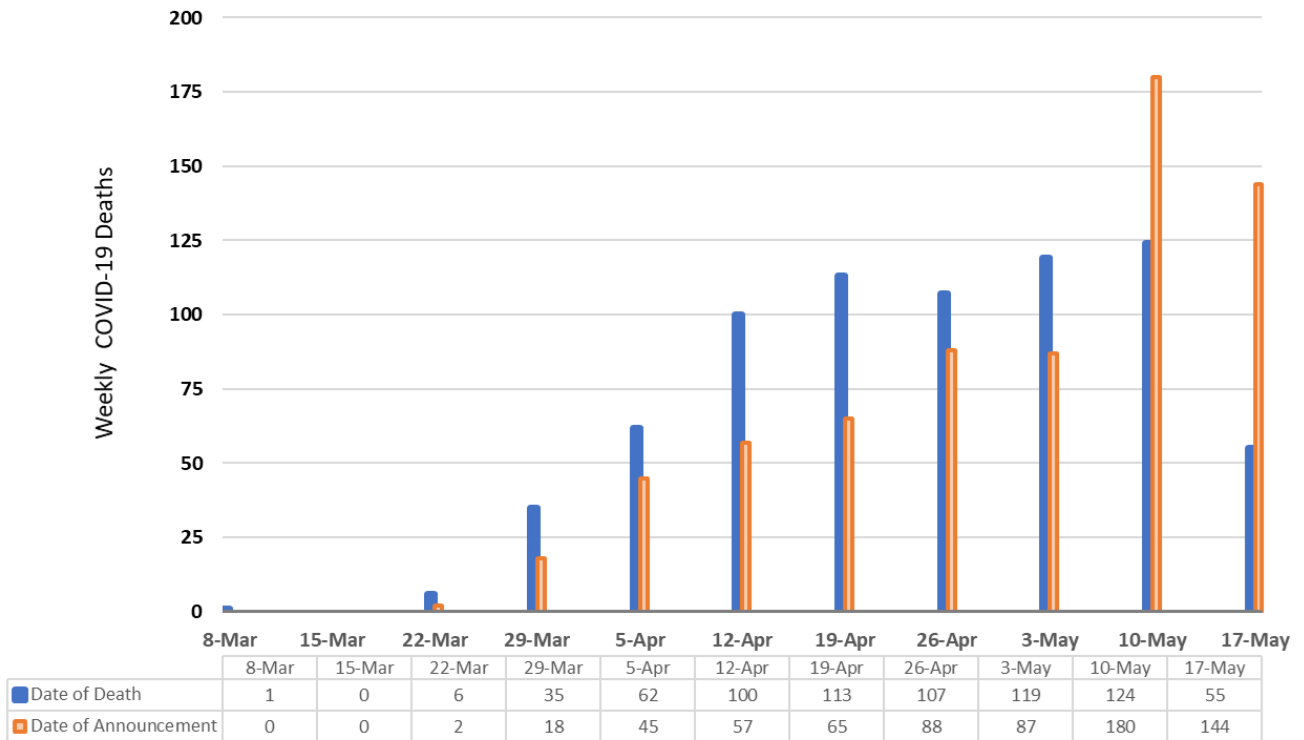


Figure 3. Weekly Arizona COVID-19 Deaths by Date of Announcement and Date of Death Mar 1 – May 17

The Centers for Disease Control and Prevention (CDC) is now [aggregating various model projections](#) to provide a consensus view of the trajectory of new COVID-19 deaths nationally and across the 50 states (Figure 4). These models predict that cumulative deaths will continue to increase at roughly the same trajectory for the next 6 weeks. A non-governmental source for similar model aggregation can be found at [FiveThirtyEight](#). Comparatively, Arizona falls somewhere in the middle of the pack with regard to the number and trajectory of COVID-19 deaths as tabulated by the [New York Times](#) (Figure 6 following page).

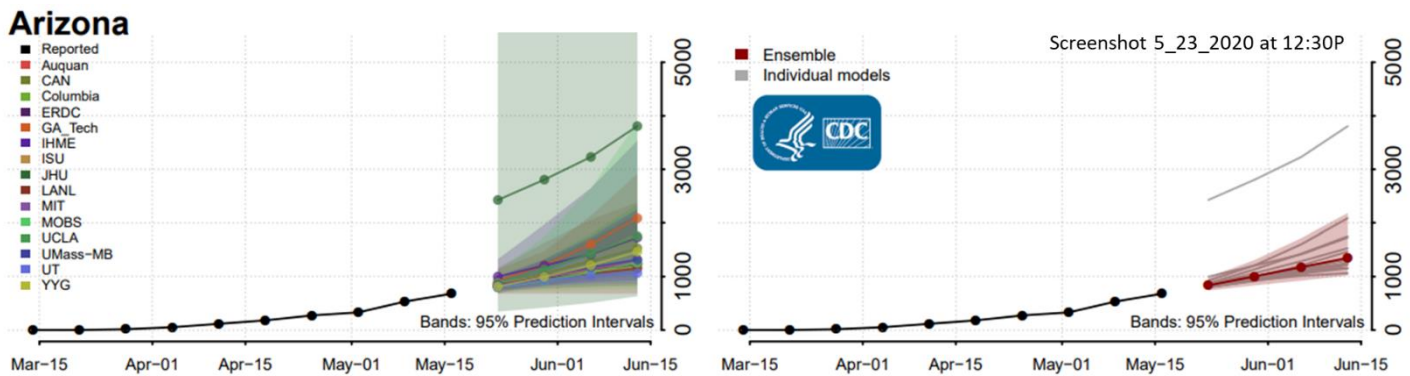


Figure 4. Centers for Disease Control and Prevention (CDC) Ensemble Forecast of COVID-19 Deaths in Arizona through June 15

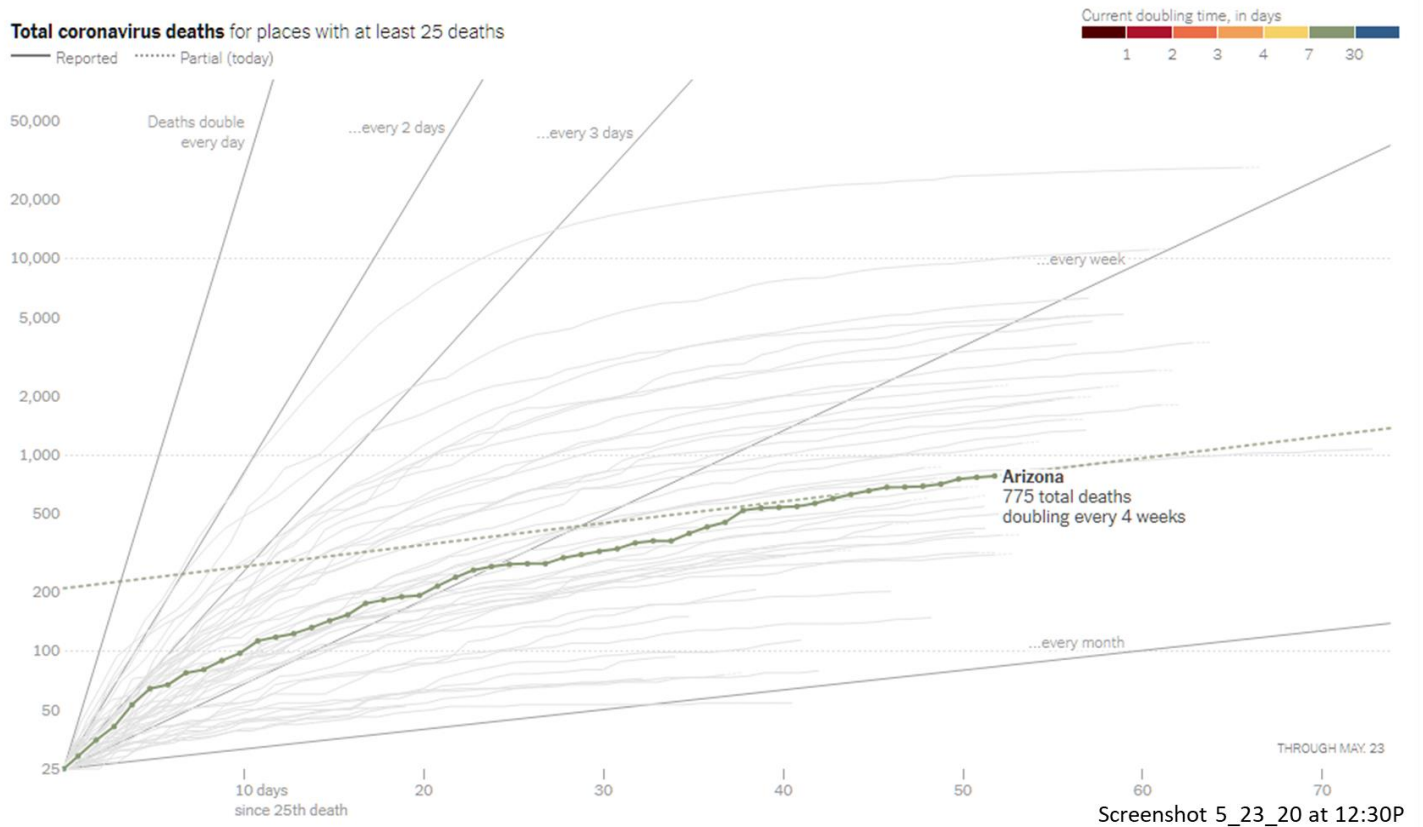


Figure 6. Total Corona Virus Deaths in Arizona Relative to Other US States, The New York Times.

As of May 22, 784 (7.7%) of Arizona's 10247 general ward beds were occupied by patients with suspected or confirmed COVID-19 infection; 1,734 (16.9%) additional beds were available for use. With regard to ICU beds, 309 (13.5%) of 2285 ICU beds were occupied by patients with suspected or confirmed COVID-19 infections; 364 (15.9%) additional beds were available for use. According to the [ADHS dashboard](#), excess capacity in general ward beds has declined from 32% to 17% since March 26. Over the same period, excess capacity in ICU beds has declined from 38% to 16%.

While total COVID-19 hospitalization has slowly increased from April 20 – May 22, the total number of ward and ICU beds devoted to COVID-19 care decreased from 1133 beds last week to 1093 beds this week (Figure 7). Unfortunately, excess capacity as indicated above has been simultaneously declining mostly due to greater non-COVID use.

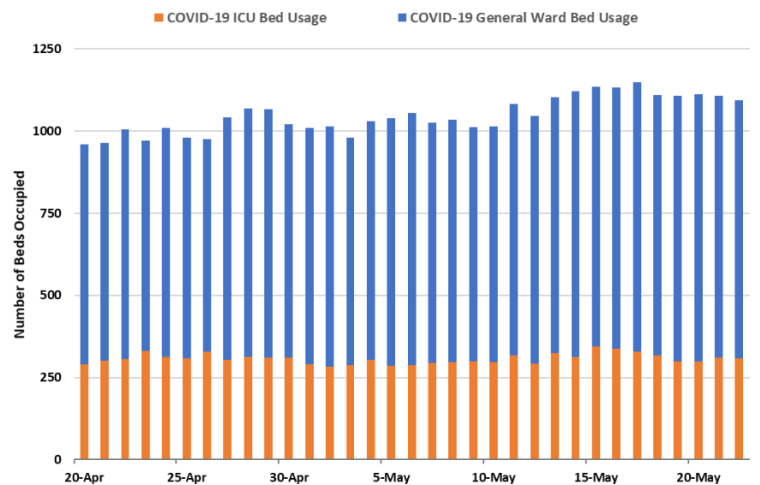


Figure 7. Arizona Daily COVID-19 General Ward and ICU Census April 20 – May 16

Pima County Outlook

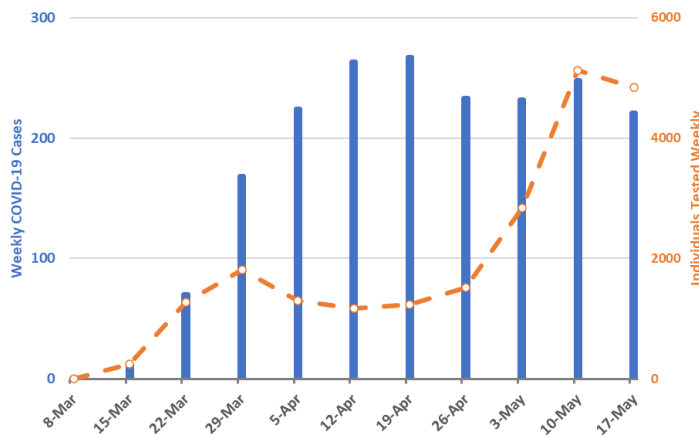


Figure 8. Newly Diagnosed COVID-19 Cases in Pima County and Individuals Tested through May 17

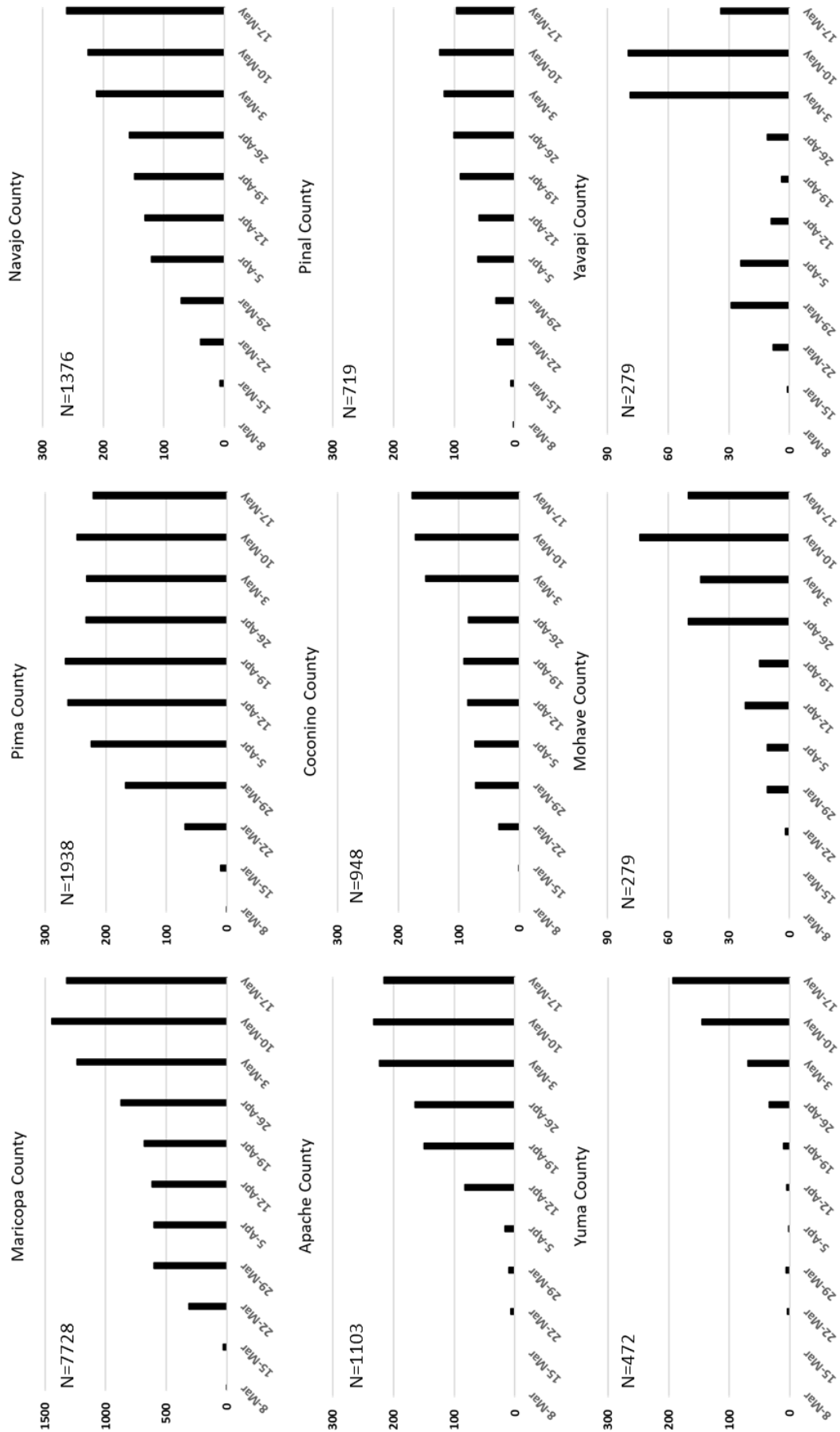
For the week ending Sunday, May 17, weekly case counts aggregated by test collection date show a decline the number of newly diagnosed cases in Pima County from the prior week (Figure 8). While changes in test capacity making it challenging to understand the true pace of viral spread, there is greater evidence that newly diagnosed cases are declining in Pima County since the week ending April 19.

Summary:

- Now that social distancing restrictions have been lifted, a greater frequency and intensity of human interactions will tend to facilitate viral spread. If this scenario is realized, increases in newly reported cases, hospitalizations, and ICU utilization would be detectable by early June.
 - Absolute levels of community-driven viral transmission remain high as evidenced by substantial numbers of newly reported cases.
 - For many locales, social distancing restrictions are likely needed to prevent reported cases, hospitalizations, and ICU utilization from increasing.
 - Hospital utilization has slowly increased over the past 4 – 6 weeks for COVID and non-COVID related care with excess capacity declining from approximately 30% to 15%. While adequate capacity exists to care for some increase in severely ill patients, additional viral spread will narrow that safety margin.
- COVID-19 testing capacity (PCR and serology) has meaningfully increased over the past several weeks; however, the PCR test positive rate remains above 3% indicating capacity is not adequate to meet clinical and public health demands. This 3% target reflects testing practices in countries that had a more robust public health response and were more effective in controlling viral spread.
- Several important changes have occurred in the past week that still make it difficult to assess the underlying trends in viral transmission. First, testing capacity has expanded identifying milder disease that would have previously remained undiagnosed. Second, ADHS added COVID-relevant causes of death from death certificates to the case definition of COVID deaths. Lastly, Arizona’s “stay-at-home” order expired May 15 likely increasing social interactions with the potential to transmit infection.

See Appendix for COVID-19 case counts by county.

Next update scheduled for May 29.



Appendix Figure A1. Weekly Covid-19 Case Counts across Arizona Counties with more than 125 Cases

Created by: Joe K. Gerald, MD, PhD (Associate Professor, Zuckerman College of Public Health, geraldj@email.arizona.edu) with gratitude to Patrick Wightman, PhD, MPP from the UA Center for Population Health Sciences for assistance with data analysis.