

COVID-19 Disease Outbreak Outlook

Arizona State and Pima County

Updated May 15, 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.

As of May 15, 13169 COVID-19 cases have been reported on the Arizona Department of Health Services (ADHS) [website](#). For the week ending Sunday, May 10, case counts aggregated by week and test collection date indicate the number of newly reported cases in Arizona continues to increase (Figure 1). Because these increases coincide with increased testing it is difficult to understand the pace of viral spread. Furthermore, these data precede the May 15 expiration of Arizona’s “stay at-home” order.

There were 45144 PCR tests performed the week ending May 10 with 5.9% being positive (Figure 2). There were 32085 serology tests performed with 2.9% being positive. The corresponding values from the prior week were 28075 and 7.4% and 21934 and 3.6%, respectively. Because serology tests are not derived from a representative sample, they likely represent an upper bound of state-wide prevalence.

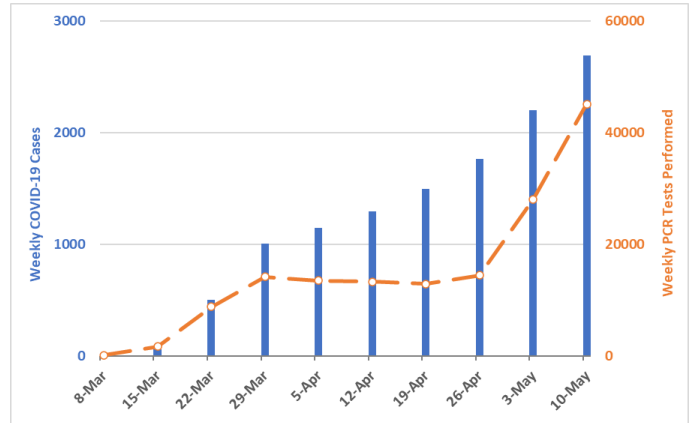


Figure 1. Weekly Arizona COVID-19 Cases by Test Collection Date and PCR Tests Performed through May 10

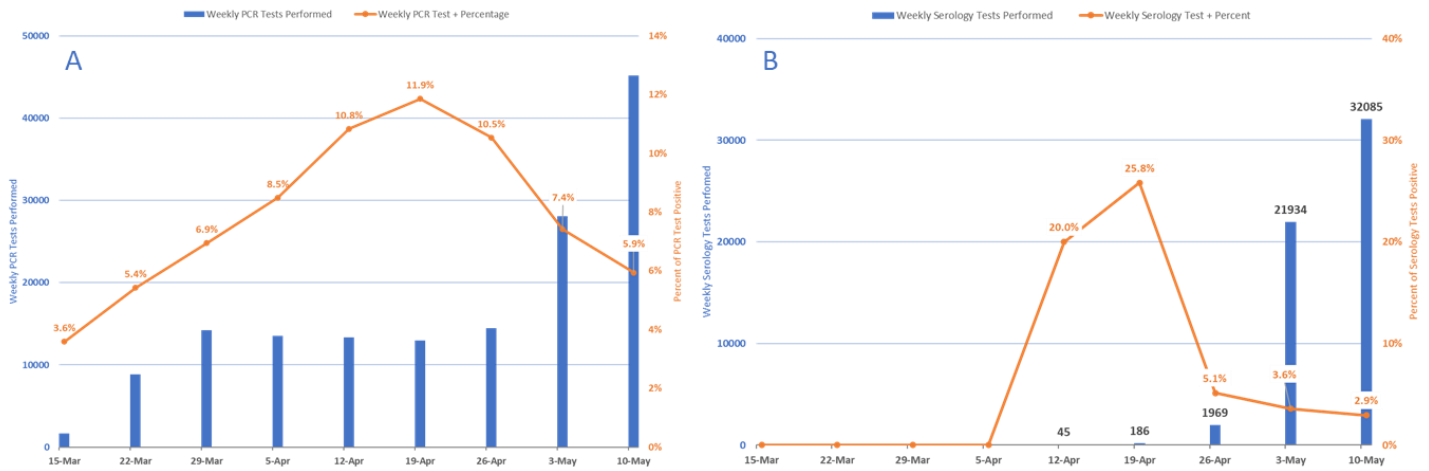


Figure 2. Weekly PCR (Panel A) and Serology (Panel B) Test Performed in Arizona through May 10

As of May 15, 651 deaths have been announced in Arizona; however, reporting lag makes it difficult to interpret these counts in real-time. For example, ADHS announced 180 new deaths during the week ending May 10, but only 87 of these deaths occurred during this period (Figure 3). The week ending May 10 is the first to clearly show the new ADHS practice of using case tracking and [death certificate data](#) to identify total deaths. There appears to be a 2 – 3 week lag in the reporting and verification of deaths. Because deaths lag new infections by about 3 weeks, it is challenging to use deaths to monitor the pace of viral spread.

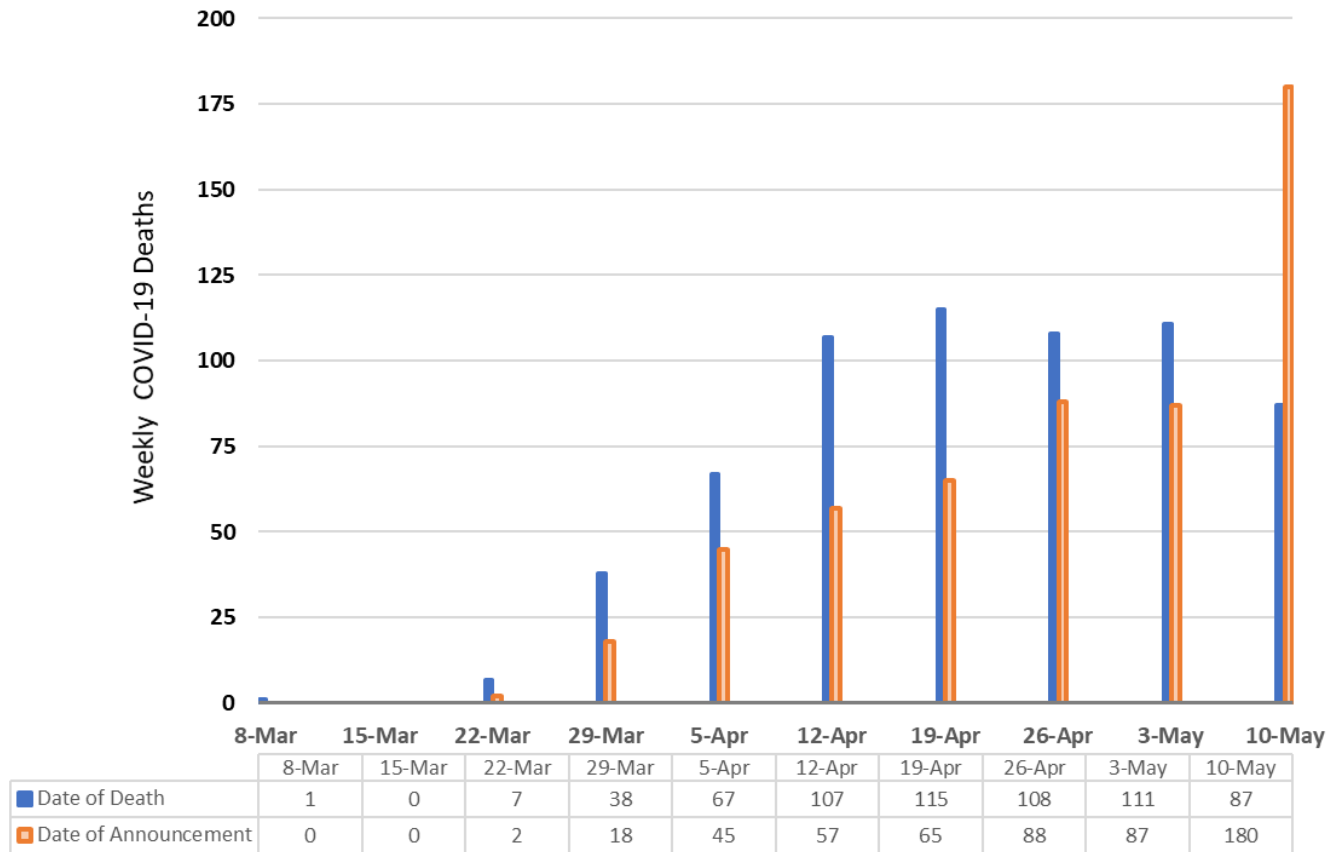


Figure 3. Weekly Arizona COVID-19 Deaths by Date of Announcement and Date of Death Mar 1 – May 10

As of May 16, 796 of Arizona’s 10370 (7.7%) general ward beds were occupied by patients with suspected or confirmed COVID-19 infection; 1,944 (18.7%) additional beds were available for use. With regard to ICU beds, 337 of 2289 ICU beds (14.7%) were occupied by patients with suspected or confirmed COVID-19 infections; 454 (19.8%) additional beds were available for use.

Trends from April 20 – May 16 are shown in Figure 4. Since April 20, the total number of ward and ICU beds devoted to COVID-19 care has increased from 959 beds to 1133 beds, an 18.1% increase. Over the same period (lagged by 1-week), the number of COVID-19 cases increased from 4288 on April 13 to 11119 on May 9, a 159% increase.

The observation that lagged case counts grew faster than hospital bed occupancy suggests that testing is expanding relative to viral transmission with individuals with lower disease severity being preferentially identified. To the extent that there are no systematic changes in hospital reporting, bed usage could provide additional valuable information to gauge the implications of increasing case counts in a context of rapidly changing testing capacity.

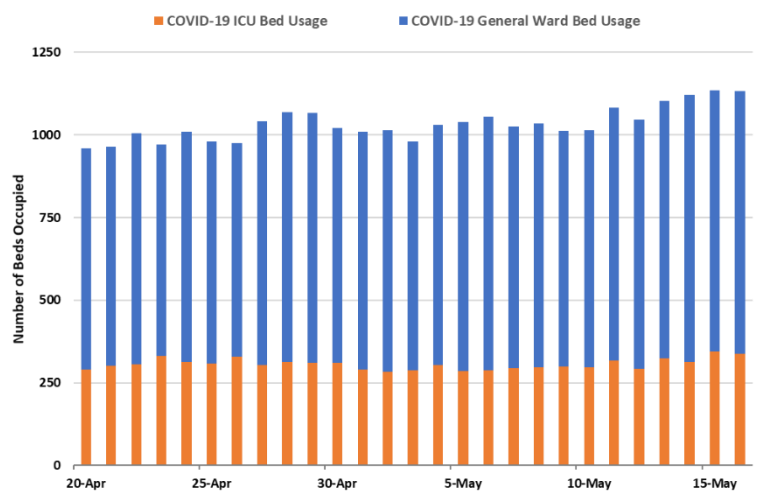


Figure 4. Arizona Daily COVID-19 General Ward and ICU Census April 20 – May 16

Pima County Outlook

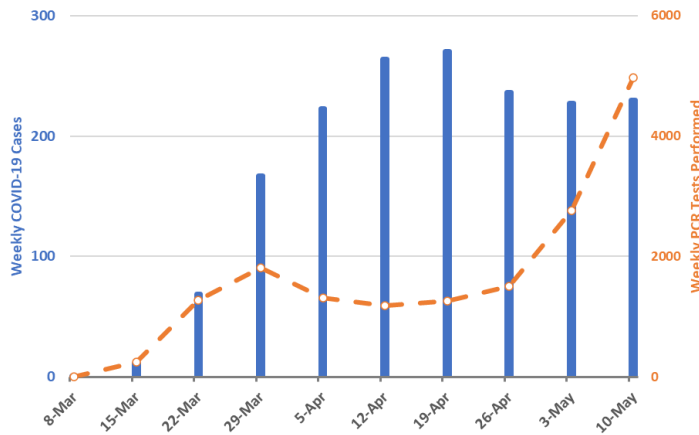


Figure 5. Weekly Pima County COVID-19 Cases and PCR Tests through May 10

As of May 15, 1781 COVID-19 cases have been reported in Pima County. When counts are aggregated weekly and by test collection date, the number of newly reported cases in Pima County was similar to the prior week (Figure 5). However, as noted in the state-wide testing trends, test capacity in Pima County is increasing rapidly making it challenging to understand the true pace of viral spread.

Summary:

- Current social distancing restrictions have slowed viral transmission, but not sufficiently to prevent newly reported cases, hospitalizations, and ICU utilization from slowly increasing.
 - Absolute levels of community-driven viral transmission remain high as evidenced by substantial numbers of newly reported cases.
 - For many locales, additional social distancing restrictions are likely needed to prevent reported cases, hospitalizations, and ICU utilization from slowly increasing.
 - For all locales, lifting social distancing restrictions will likely accelerate the pace of viral transmission leading to increasing case counts and hospital utilization.
 - Newly reported cases are increasing faster than hospitalization, suggesting that expanded testing is identifying patients with milder disease. Nevertheless, hospital utilization continues to slowly increase indicating slowly increasing viral transmission.
 - While adequate hospital 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 will make it difficult to assess the pace of viral spread for several weeks. First, testing capacity as expanded identifying milder disease that would have previously remained undiagnosed. Second, ADHS added COVID-relevant causes of death to the case definition. Lastly, Arizona's "stay-at-home" order expired May 15 likely increasing social interactions with the potential to transmit infection.

Next update scheduled for May 22.