

# Covid-19 Disease Outbreak Outlook

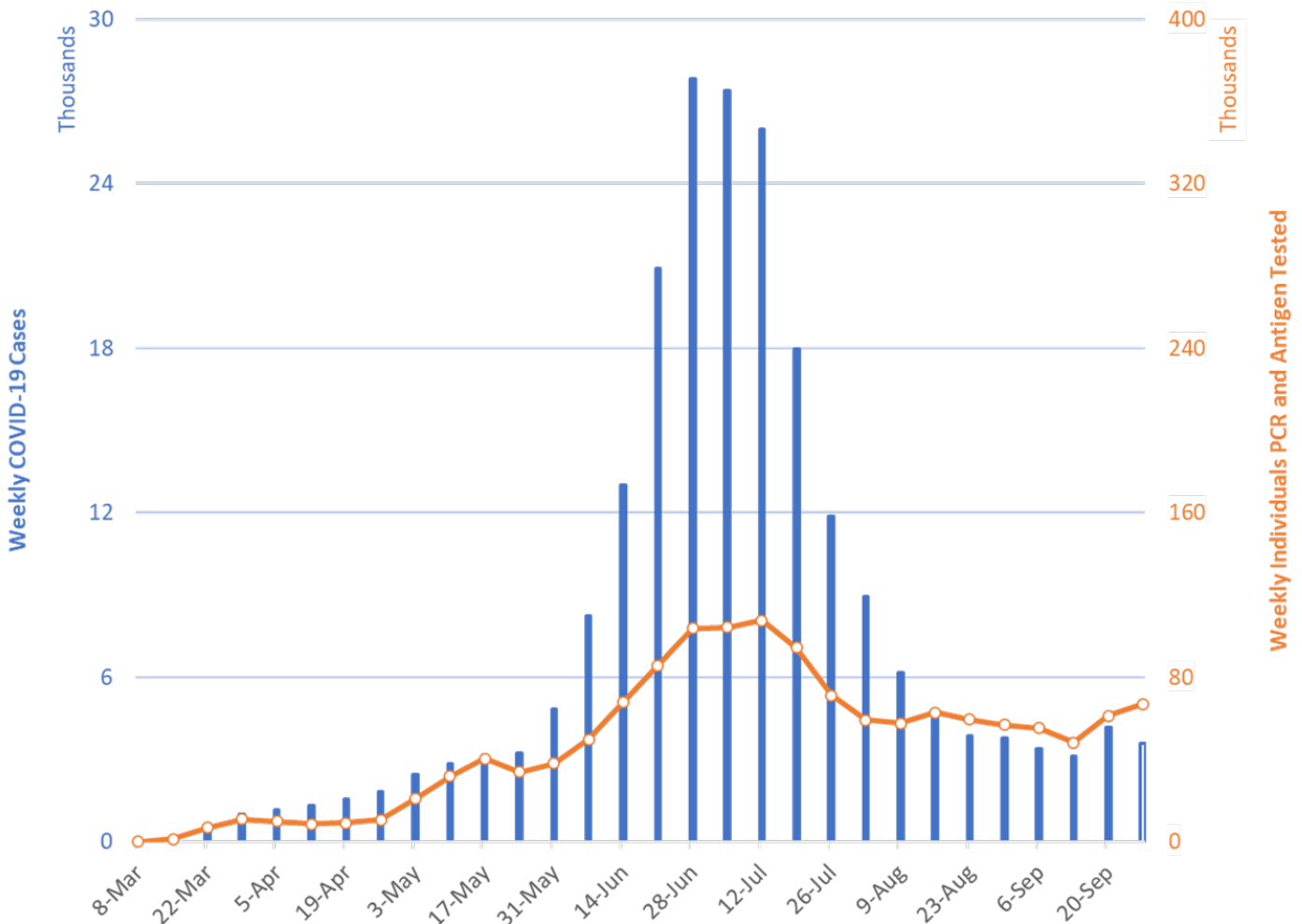
## Arizona State and Pima County

Updated October 2, 2020

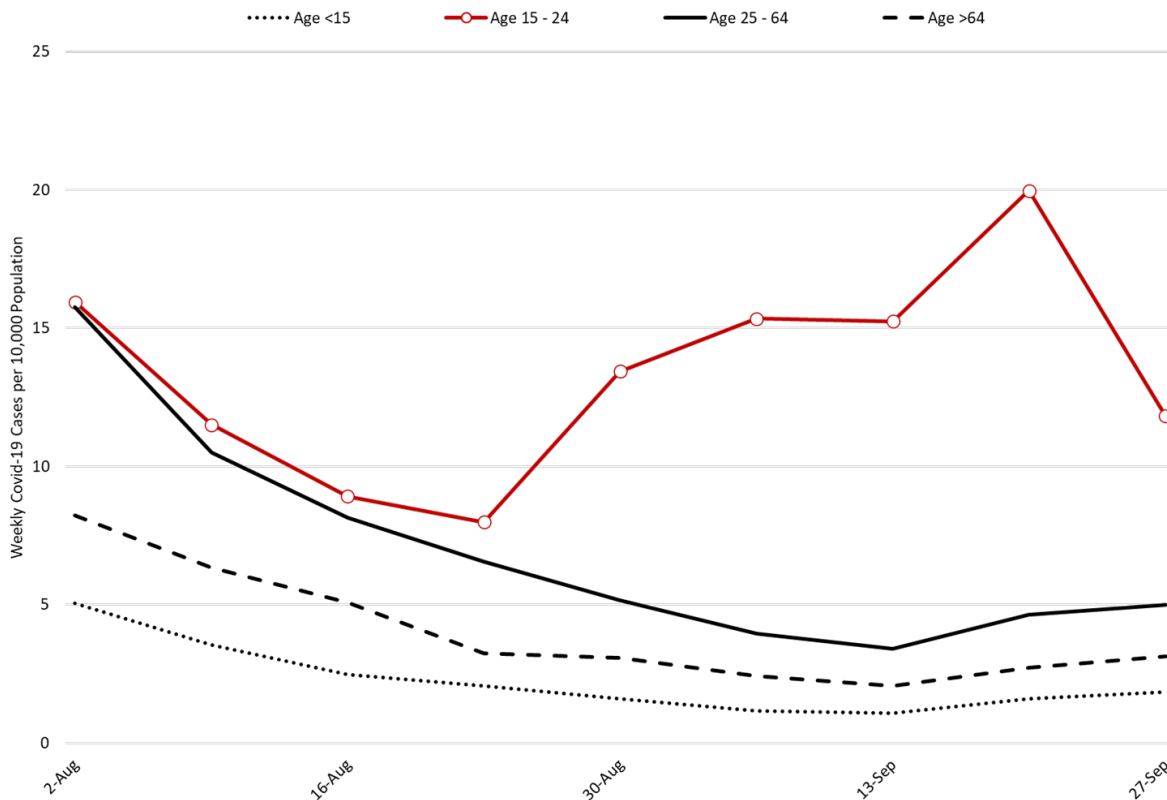
**Disclaimer:** This information represents my personal views and not those of The University of Arizona, the Zuckerman College of Public Health, or any other government entity. Any opinions, forecasts, or recommendations should be considered in conjunction with other corroborating and conflicting data. Updates can be accessed at <https://publichealth.arizona.edu/news/2020/covid-19-forecast-model>.

For the week ending September 27th, 3592 new Covid-19 cases were diagnosed in Arizona (Figure 1). This represents a 14% decrease from last week's revised tally of 4166 cases. Because delays in test reporting remain minimal, last week's initial tally of 4048 new cases was only upwardly revised by 118 cases (3%) this week. **Note:** Testing counts in Figure 1 now reflect PCR testing (nasopharyngeal and saliva) and antigen testing. Because the impact of the added antigen tests is small relative to the larger number of PCR tests being conducted, only the combined results are illustrated Figure 1.

Arizona's Covid-19 outbreak remains bifurcated. Case counts among those 15 – 24 years of age are briskly decreasing, 790 fewer cases than last week, while case counts among all other age groups are slowly increasing, 216 more cases than last week (Figure 2 following page). The increase among those not 15 – 24 years has been evident for 2 weeks. It warrants reappraisal of individual and population adherence with mitigation efforts such as face masks, physical distancing, and hand hygiene. While viral transmission levels remain comparable to those of late May, they can increase rapidly if momentum builds.



**Figure 1. Newly Diagnosed Covid-19 Cases in Arizona and Number of Individuals Undergoing PCR and Antigen Testing March 1 through September 27.**



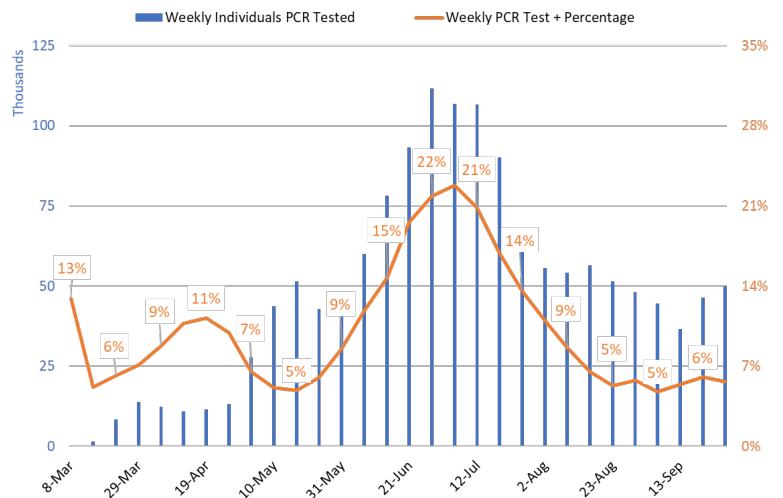
**Figure 2. Newly Diagnosed Covid-19 Cases in Arizona by Age July 27 through September 27.**

Test positivity among those undergoing PCR testing, including saliva testing, has fluctuated between 5 – 6% for the past 7 weeks (Figure 3) which is near the recommended level of  $\leq 5\%$ .

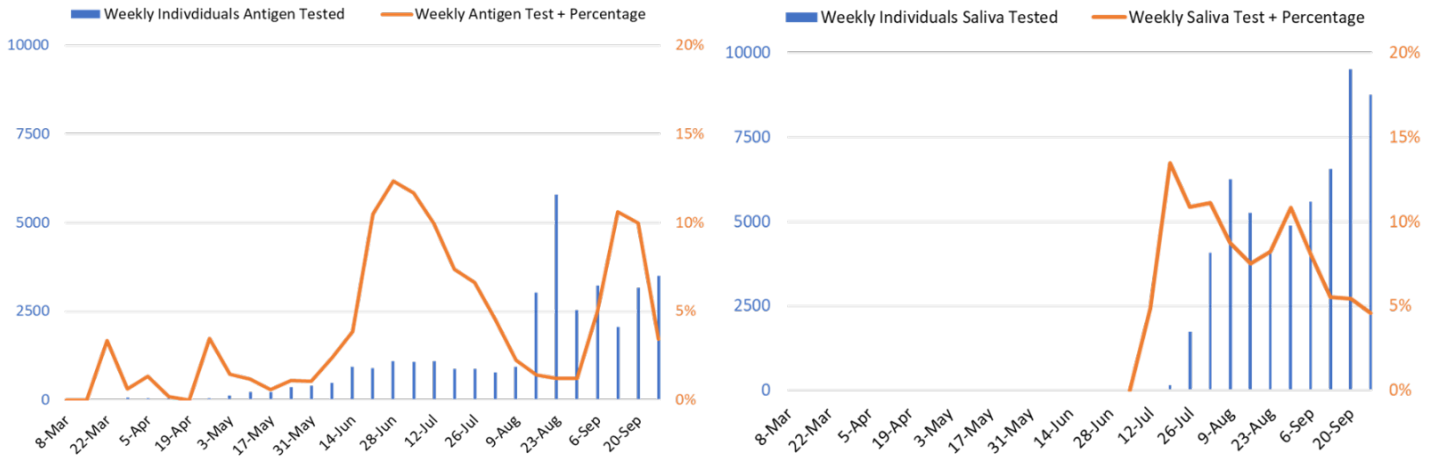
Antigen testing being conducted by the University of Arizona, some long-term care facilities, and some retail clinics noticeably increased the week ending August 16<sup>th</sup> due to back-to-school testing at the University of Arizona (Figure 4, left panel). In a recent reversal of past trends, antigen positivity is now lower than PCR positivity, 3.4% versus 5.6%, respectively.

Saliva testing being conducted by Arizona State University for students and other groups first appears at the end of July (Figure 4, right panel). The test positive percentage for saliva testing is now 4.6%.

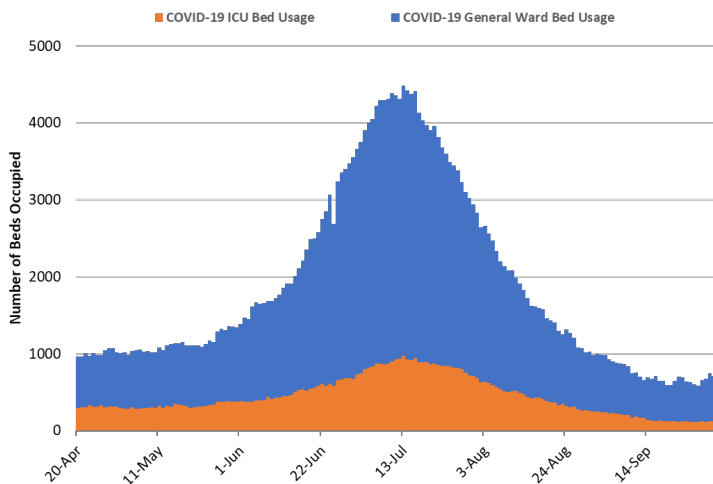
The 3 testing streams (traditional PCR from clinical settings, saliva PCR from ASU, and antigen testing from the UA) are generally consistent with the case data. The return of students to university campuses was associated with increased testing. Early test positivity trends indicated viral transmission increased during the first weeks of the students' return to campus but have since peaked and are now declining along with cases counts.



**Figure 3. Weekly Number Patients PCR Tested and Percent with Positive Test March 1 – September 27.**



**Figure 4. Weekly Number Patients Undergoing Covid-19 Antigen (left) and Saliva (right) Testing and Corresponding Percent Positive Results March 1 – September 27.**

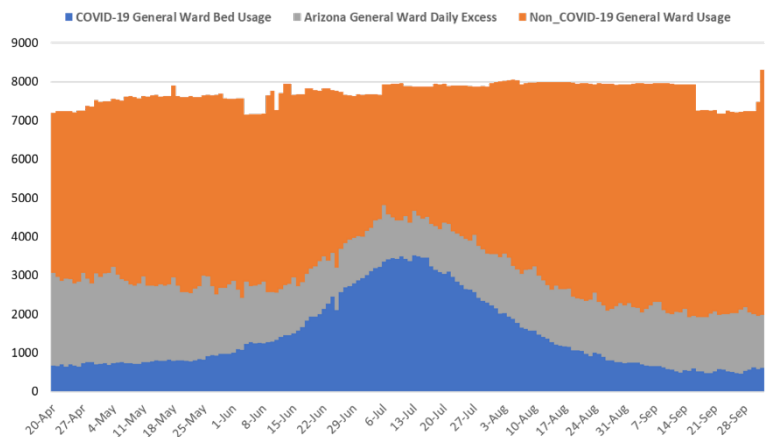


**Figure 5. Arizona Daily Covid-19 General Ward and ICU Census April 20 – October 2.**

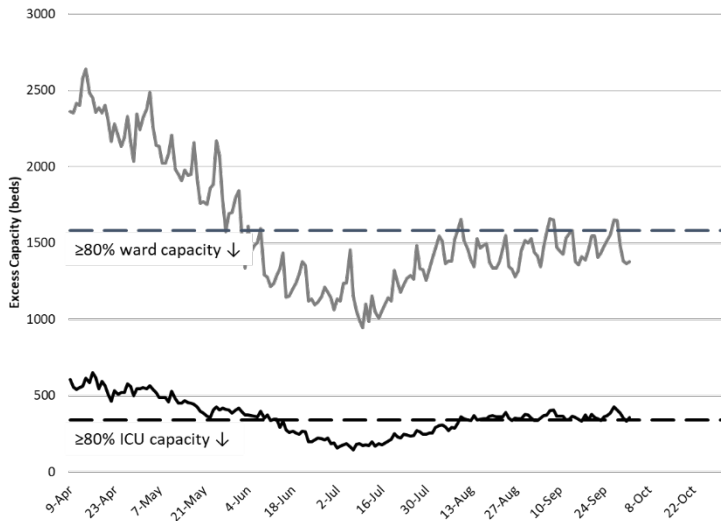
As of October 2nd, 732 hospital beds were occupied by patients with suspected or confirmed Covid-19. This number is higher than the 624 occupied beds reported last week (Figure 5). However, this increase also coincides with a noticeable increase in hospital reporting of general ward beds.

As of October 2nd, 605 (7%) of Arizona’s 8312 general ward beds were occupied by Covid-19 patients, a 19% increase from last week’s 509 occupied beds. However, the total number of hospital beds also unexpectedly increased by 826 beds, 7228 beds to 8312 beds (Figure 6, upper right). An additional 1376 (17%) beds remain available for use which is lower than last week’s 1518 beds.

Because Covid-19 occupancy has remained stable over this time, 7.0% last week versus 7.3% this week, this week’s change in general ward occupancy likely represents inconsistent hospital reporting over the past several weeks. However, some small part of this increase could be “real” since Covid-19 cases are slowly increasing in age groups >24 years.



**Figure 6. Covid-19, Non-Covid, and Excess General Ward Occupancy April 20 – October 2.**

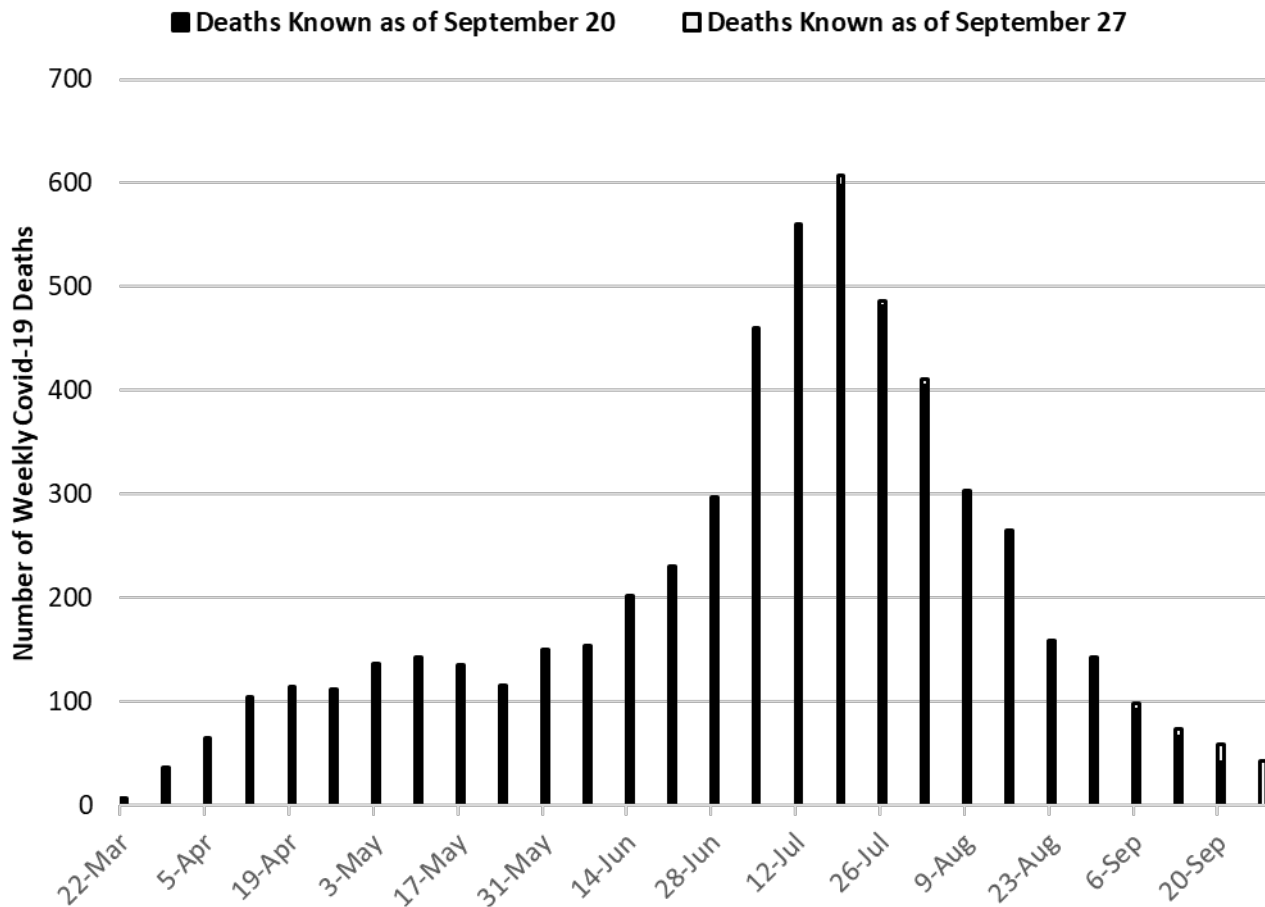


**Figure 7. Observed and Projected Excess Non-Surge General Ward and ICU Capacity April 20 – October 31.**

As of October 2nd, 127 (8%) of Arizona’s 1631 ICU beds were occupied for Covid-19 care, a 10% increase from last week’s 115 occupied beds. The total number of ICU beds has not appreciably changed over the same period, 1629 to 1631 beds. An additional 359 (22%) ICU beds remain available which is similar to last week’s number, 369 beds.

Arizona will not exceed its listed capacity of non-surge general ward or ICU beds unless improvements reverse (Figure 7). Nevertheless, state-wide occupancy for general ward beds has been ≥80% for the past 2 months presumably due to the backlog of elective procedures.

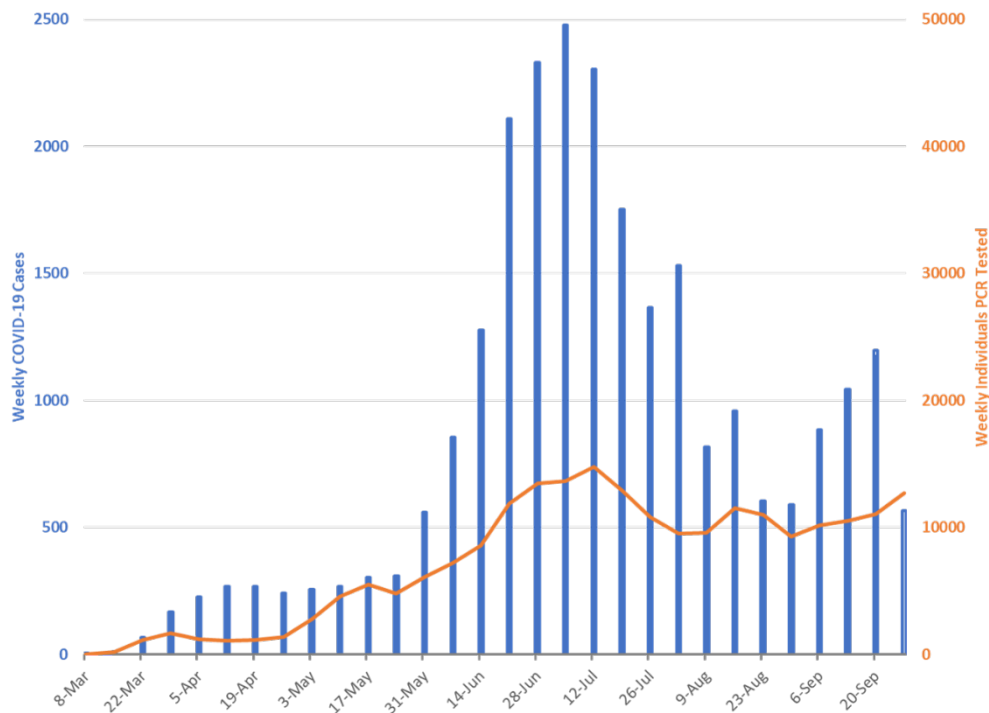
With 607 deaths reported to date, the week ending July 19th remains Arizona’s deadliest week (Figure 8). Because new case counts are relatively stable, mortality trends are also expected to be stable or declining for the foreseeable future.



**Figure 8. Weekly Known Arizona Covid-19 Deaths March 1 – September 27.**

## Pima County Outlook

For the week ending September 27th, 565 Pima County residents were diagnosed with Covid-19 (Figure 9). This represents a 53% reduction from the 1197 confirmed cases last week. This reduction is attributable to the 14-day shelter-in-place recommendation imposed on the University of Arizona campus. Because this “order” expired September 29<sup>th</sup>, there is uncertainty whether this improvement will be sustained in the coming weeks.



**Figure 9. Covid-19 Cases and Number of Individuals PCR and Antigen Tested in Pima County through September 27.**

## University Outlook

Both the [University of Arizona](#) and [Arizona State University](#) report aggregate cases. The University of Arizona has reported 2342 cases since July 31<sup>st</sup> which is only somewhat higher than the 2291 identified this time last week. This decline is illustrated in Figure 10.

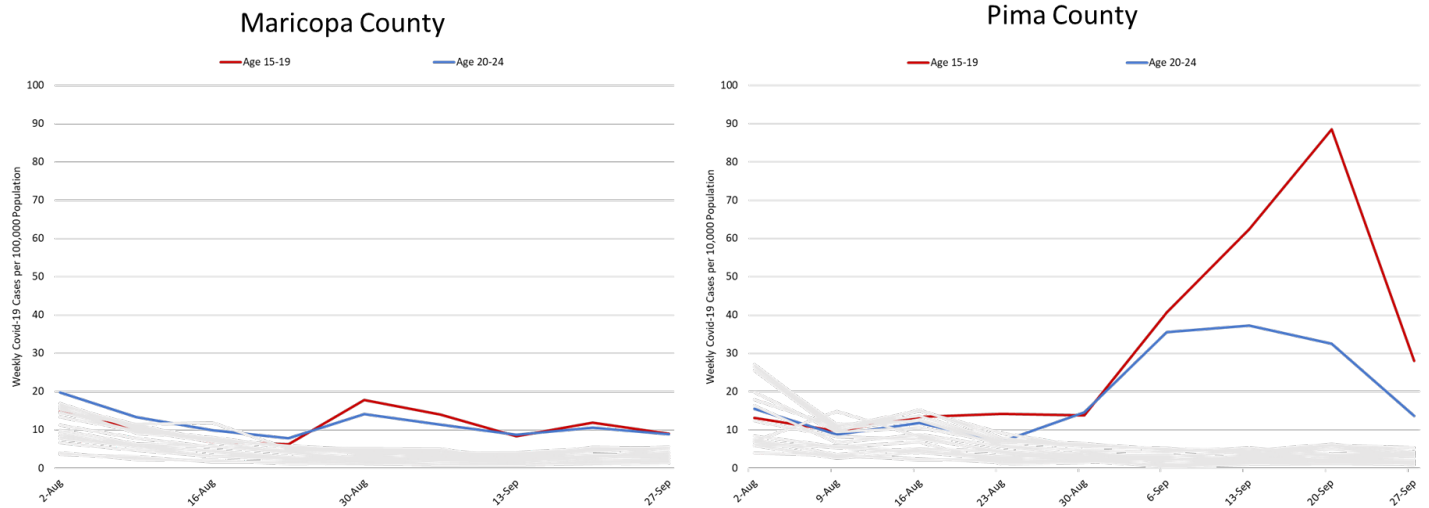
ASU has reported 1852 cases since August 1st which is also somewhat higher than the 1753 cases reported this time last week. The impact of both universities on county-specific aggregate data are shown in Figure 11 on the follow page).

In summary, Maricopa County experienced increased case rates among those 15 –24 years during the last week of August. These rates are now generally declining. Pima County experienced a later, a larger, and a more sustained increase. Nevertheless, its cases rates are also trending downward now.

## 7-Day Average of Positive Test Results



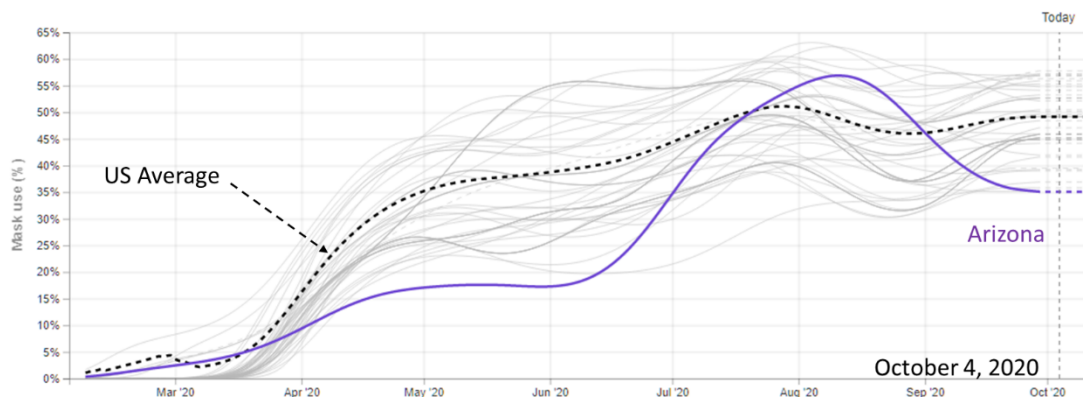
**Figure 10. 7-Day Average of Covid-19 Cases Identified by University of Arizona through September 29 as Reported on UA Dashboard.**



**Figure 11. Population-Normed Covid-19 Cases per 10,000 population by Age Group Jul 27 – September 27 in Maricopa and Pima Counties (best viewed in color).**

**Summary:**

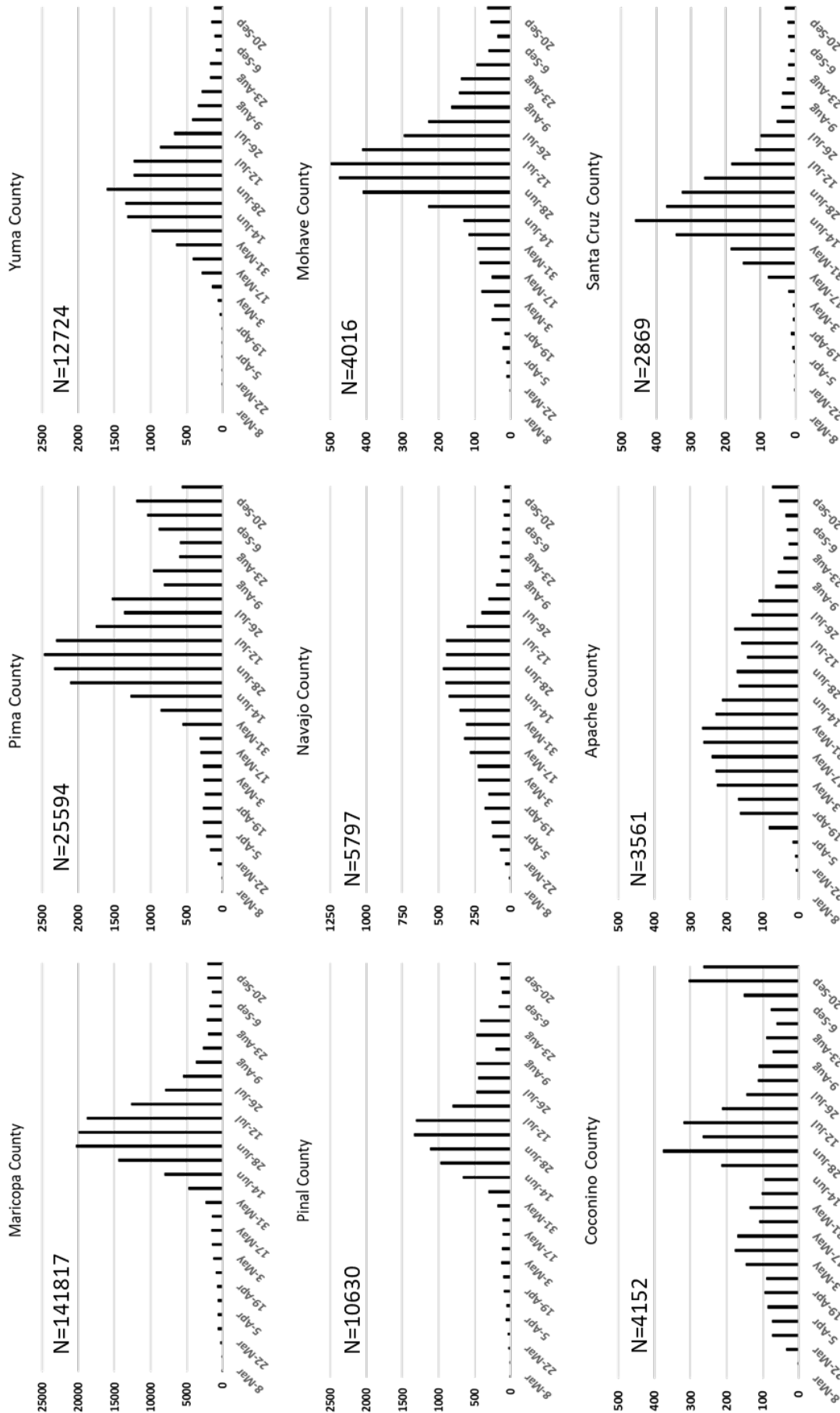
- Over the past 4 – 6 weeks, the Arizona Covid-19 outbreak has separated into two distinct trends.
  - Viral transmission among those 15 – 24 years of age is much higher than among other age groups. These cases are attributable to transmission on university campuses. These case rates have been generally declining for the past two weeks.
  - Viral transmission among those <15 years and >24 years is considerably lower. However, these rates have been slowly increasing for the past two weeks.
- Overall, levels of community-driven viral transmission are comparable to those observed in mid-to-late May as Arizona re-opened its broader economy.
  - Mask-wearing ordinances will be needed for the foreseeable future to mitigate the spread of Covid-19. Reinforcement of mitigation measures is necessary to address rising case counts as suggested by the [decline in self-reported adherence to face masks](#).



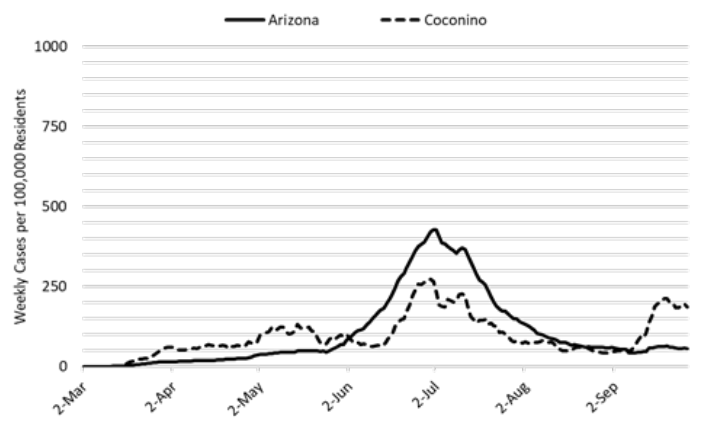
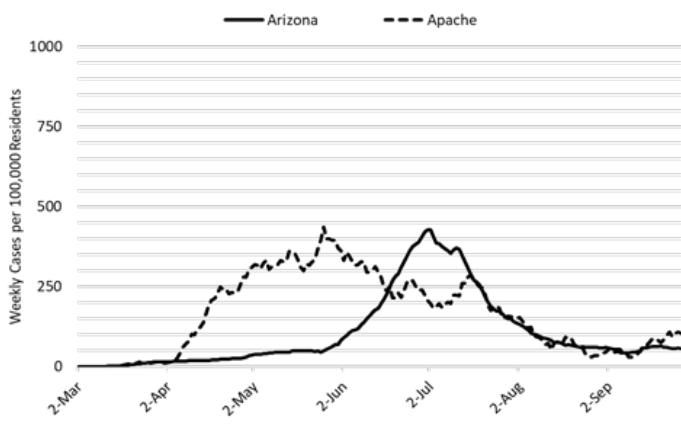
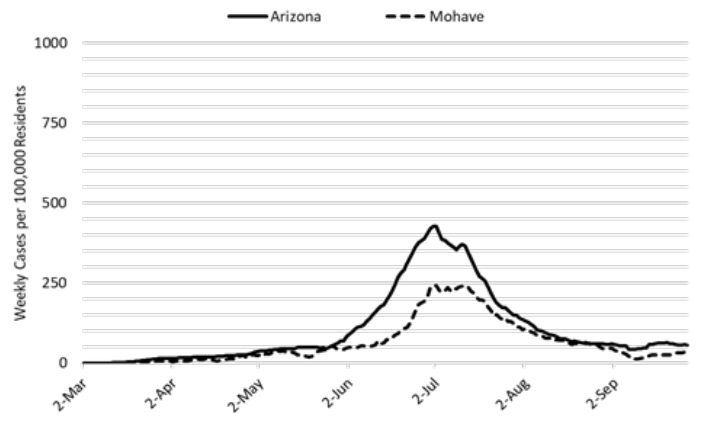
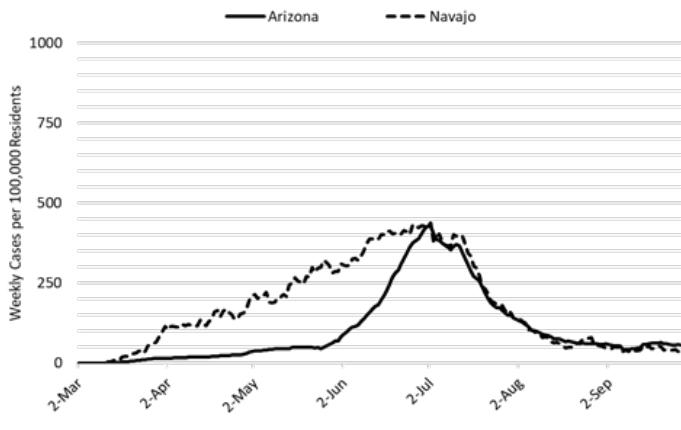
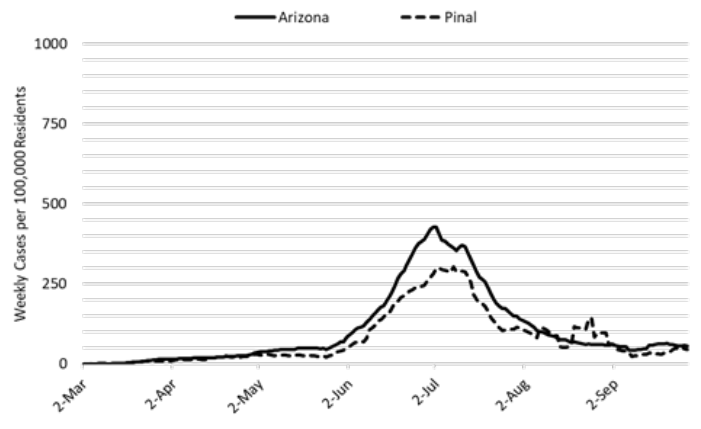
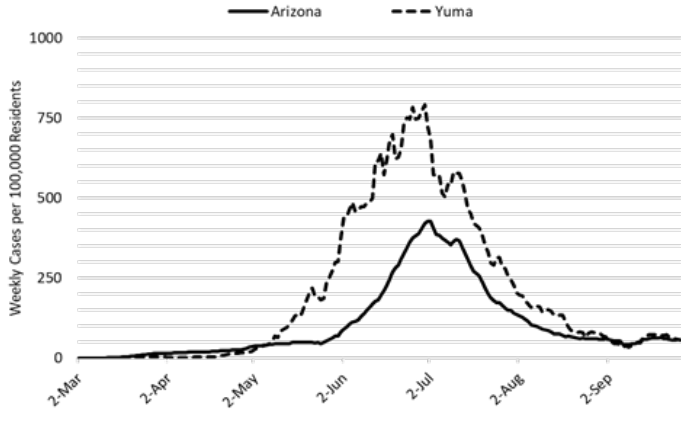
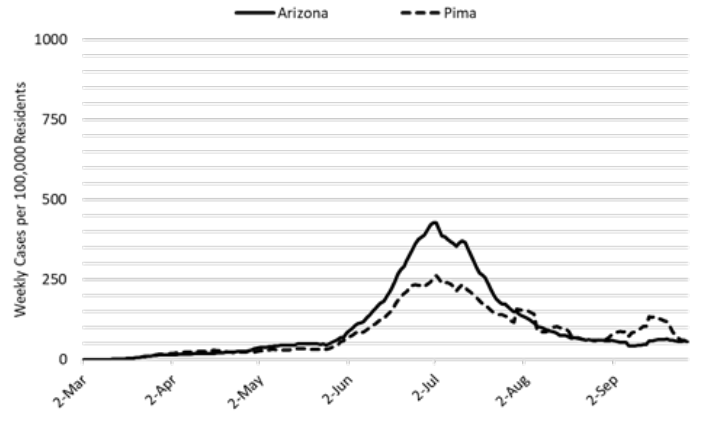
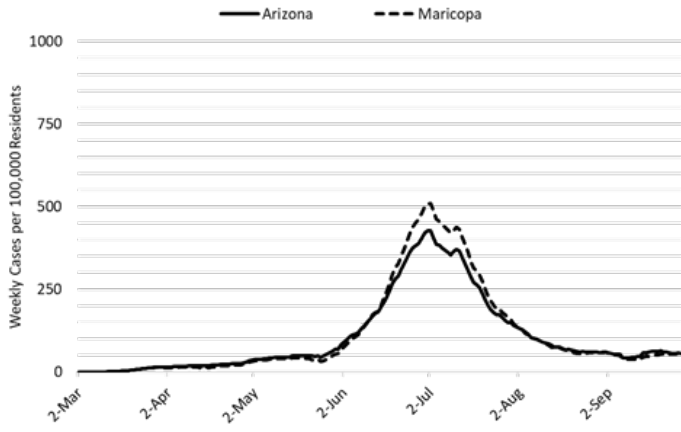
- Covid-related hospital utilization remains stable. Adequate capacity remains available for the foreseeable future even though non-Covid hospitalizations are expected to increase through January.
- Current Covid-19 test capacity is adequate as evidenced by quick turn-around for PCR results and a PCR test positivity of 5 - 6% which is near the recommended threshold.

Next update scheduled for October 9.

County Data (weekly crude and population-adjusted cases counts) appear in Appendix.



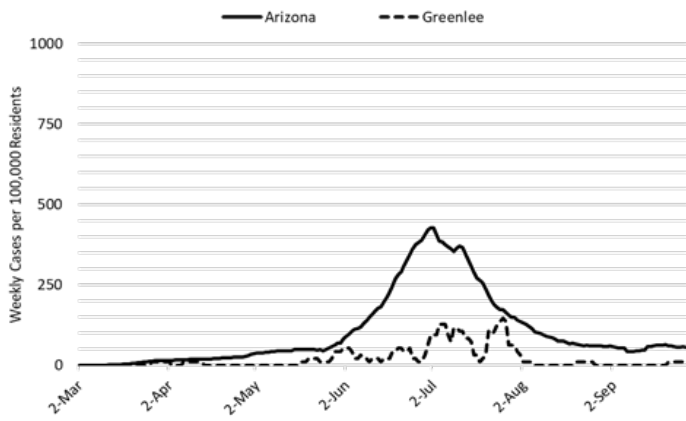
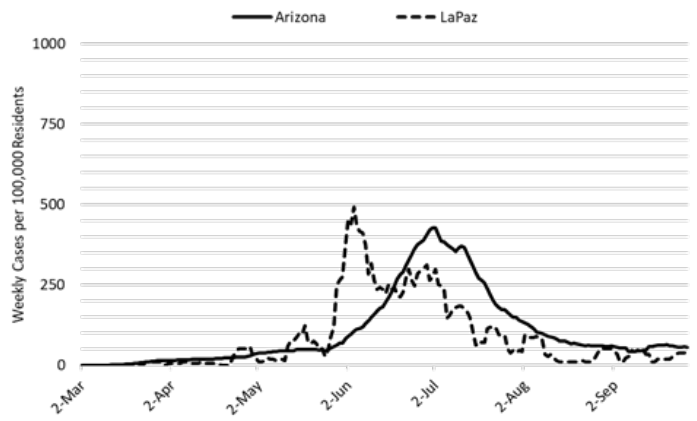
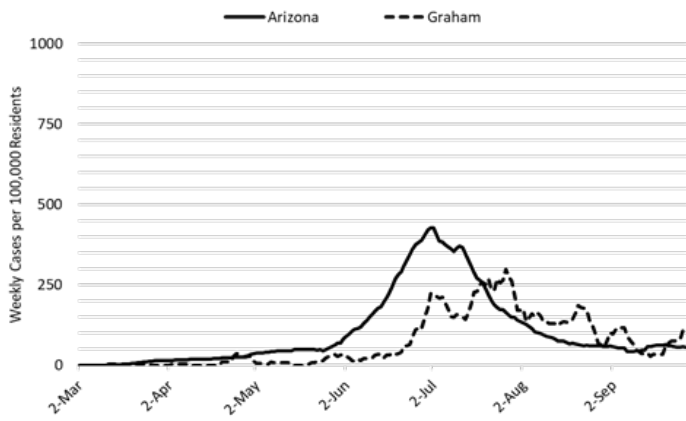
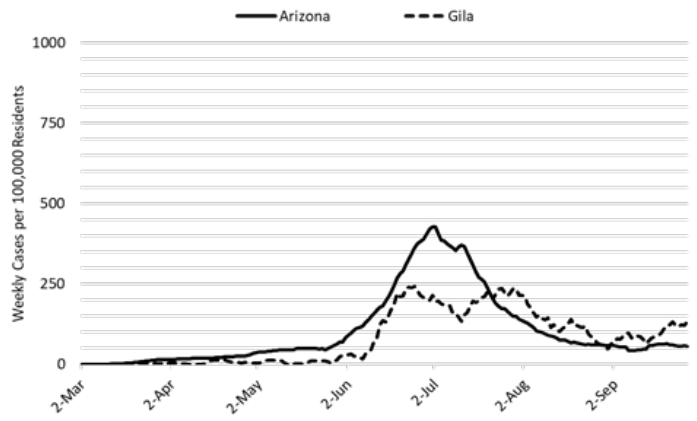
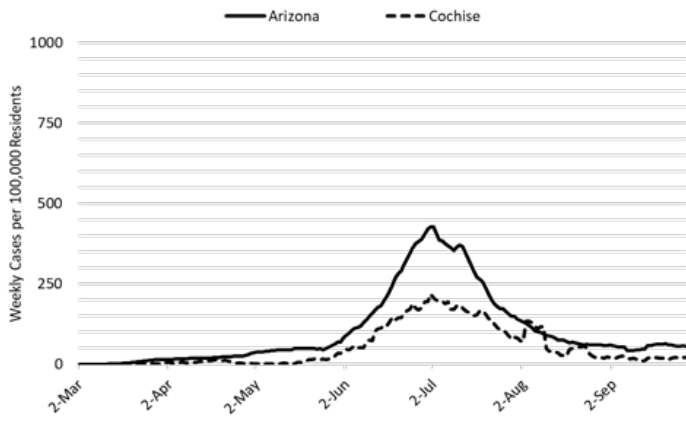
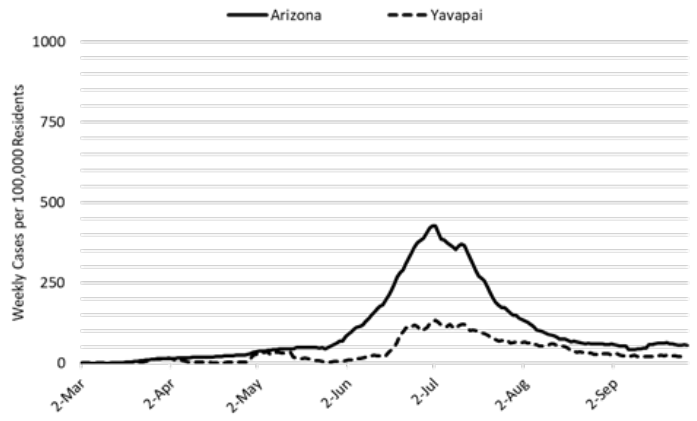
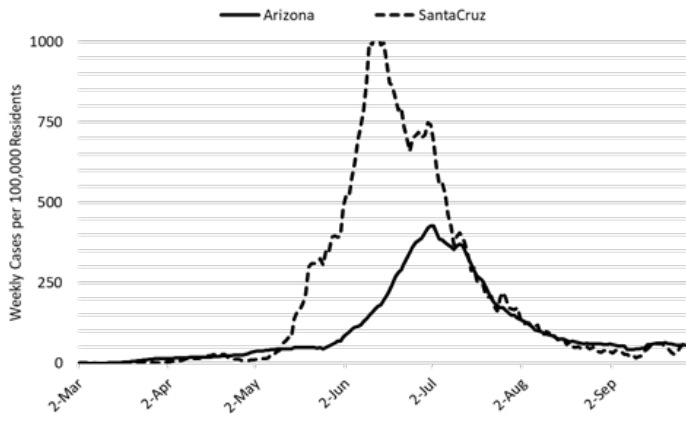
**Appendix Figure 1. Weekly Covid-19 Cases by County March 1 – September 27.**



**Appendix Figure 2. Weekly Covid-19 Cases per 100,000 Residents by County March 1 – Sept 27.**

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





**Appendix Figure 2. Weekly Covid-19 Cases per 100,000 Residents by County March 1 – Sept 27.**

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