

Covid-19 Disease Outbreak Outlook

Arizona State and Pima County

Updated September 25, 2020

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For the week ending September 20th, 4048 new Covid-19 cases were diagnosed in Arizona (Figure 1). This represents a 32% increase over last week's tally of 3068 cases. It is the first week-over-week increase since late June. While half of the increase is attributable to those 15 – 24 years of age, trends among other age groups are increasing too. The reversal is worrisome and warrants reappraisal of individual and population adherence to mitigation efforts like face coverings, physical distancing, and hand hygiene. While current levels of viral transmission are comparable to those of mid-to-late May, history shows that increases can compound quickly; and once momentum builds, it can be difficult to stop.

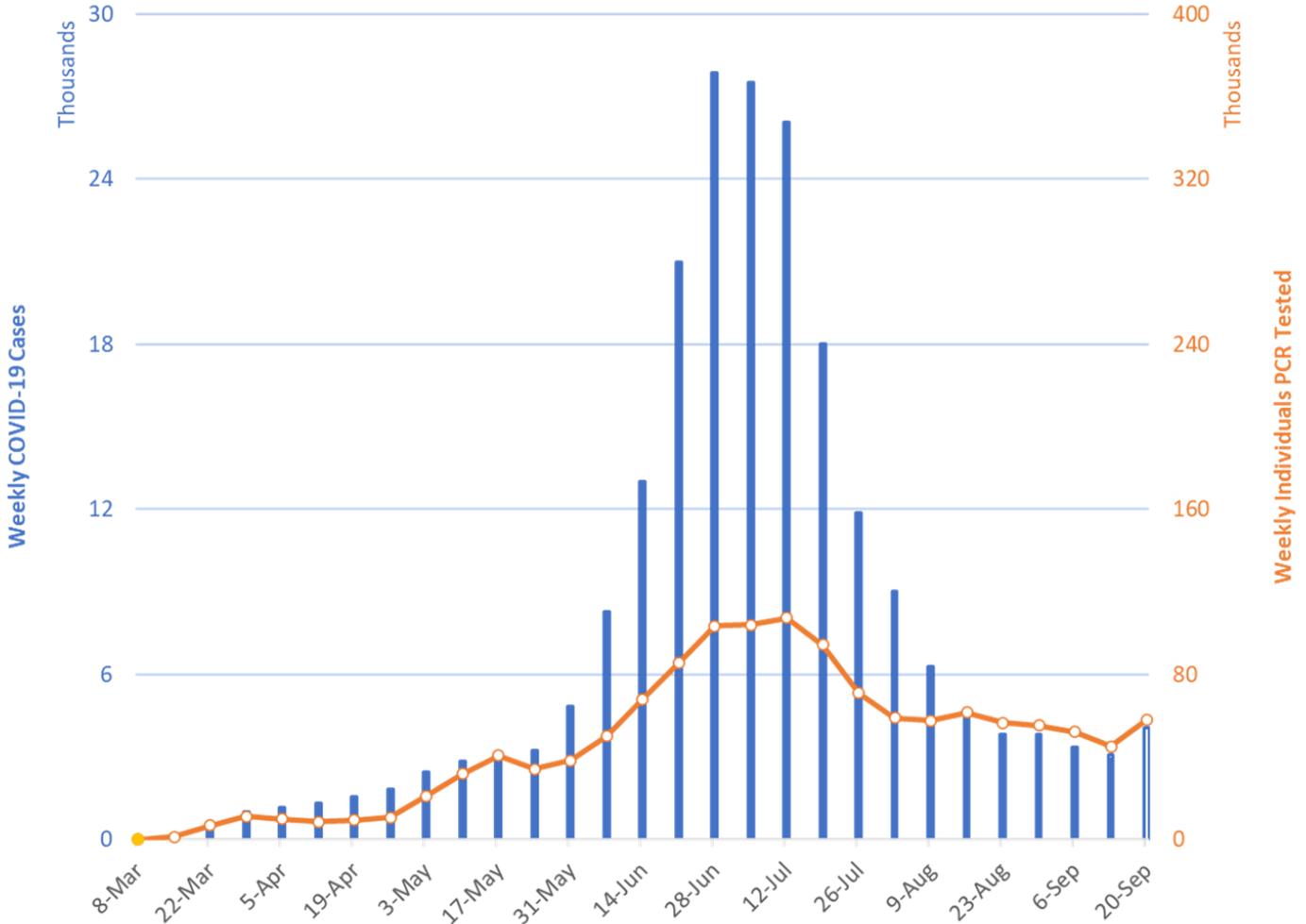


Figure 1. Newly Diagnosed Covid-19 Cases in Arizona and Number of Individuals Undergoing PCR Testing March 1 through September 20.

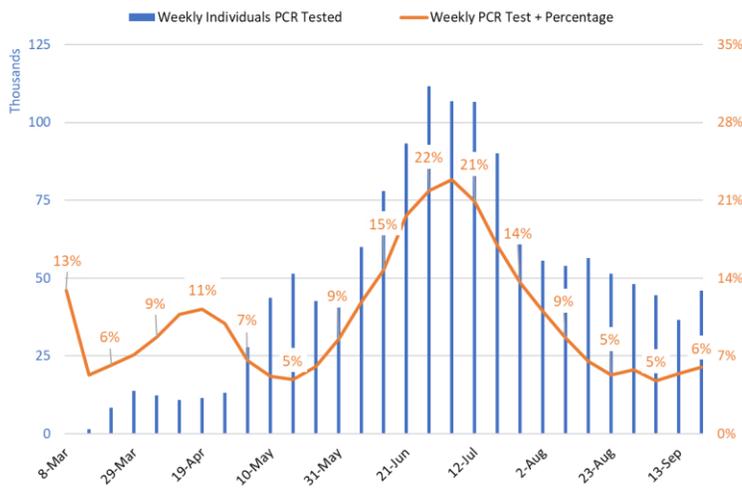


Figure 2. Weekly Number Patients PCR Tested and Percent with Positive Test March 1 – September 20.

The test positive percentage among patients undergoing PCR testing, including saliva testing, is increasing. A nadir of 4.8% was observed the week ending September 6th; it is now 6.0% (Figure 2). The number of patients being tested is also increasing, 36587 the week ending September 13 versus 46052 the week ending September 20. While the test positive percentage remains close to the recommended level, these recent changes support the notion that community transmission is increasing.

Antigen testing is being conducted by the University of Arizona and some long-term care facilities. Beginning August 10th, a marked increase in antigen testing was noted in the state data (Figure 3, left panel). This increase is most likely attributable to University of Arizona testing.

The number of individuals undergoing antigen testing is small compared to the number undergoing PCR testing, 3000 versus 45000 per week. The test positivity for antigen testing tends to be somewhat higher than PCR testing. For example, antigen positivity was 10.2% this past week versus 6.0% for PCR testing. This higher positivity is consistent with higher rates of transmission among university students than the broader population.

Saliva testing being conducted by Arizona State University first appears at the end of July. Approximately 9000 individuals are being tested weekly, about 3 times the number undergoing antigen testing. The test positive percentage for saliva testing was 5.5% last week, down from 10.6% the last week of August.

The 3 testing streams (traditional PCR from clinical settings, saliva PCR from ASU, and antigen testing from the UA and long-term care facilities) are generally consistent with the case data. The return of students to university campuses was associated with increased testing and identification of cases. Test positivity trends indicated viral transmission increased during the early weeks of the students' return but has since peaked.

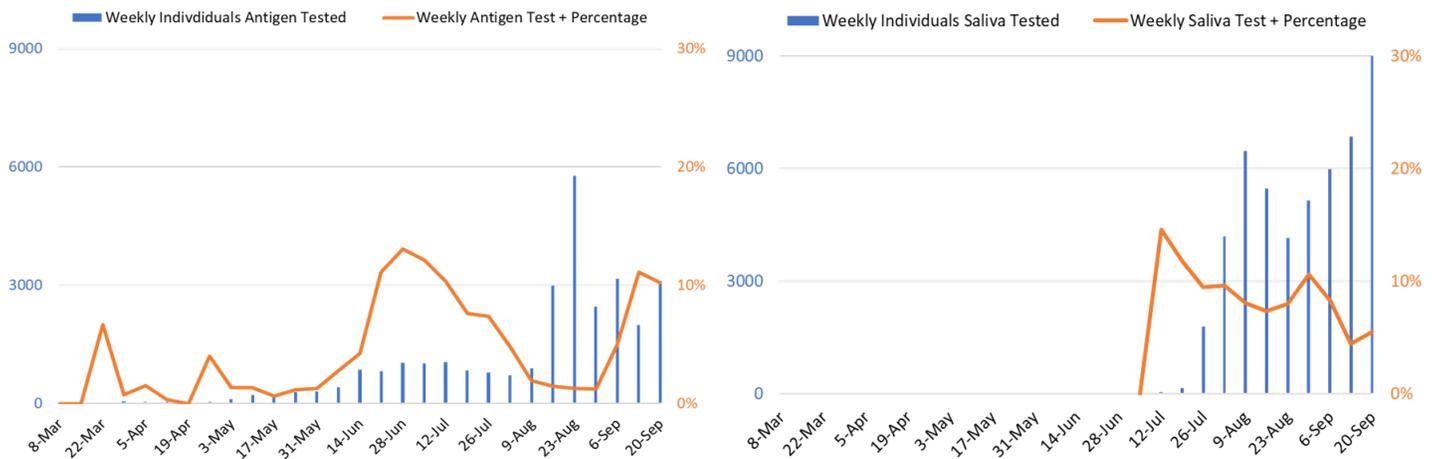


Figure 3. Weekly Number Patients Undergoing Covid-19 Antigen (left) and Saliva (right) Testing and Corresponding Percent Positive Results March 1 – September 20.

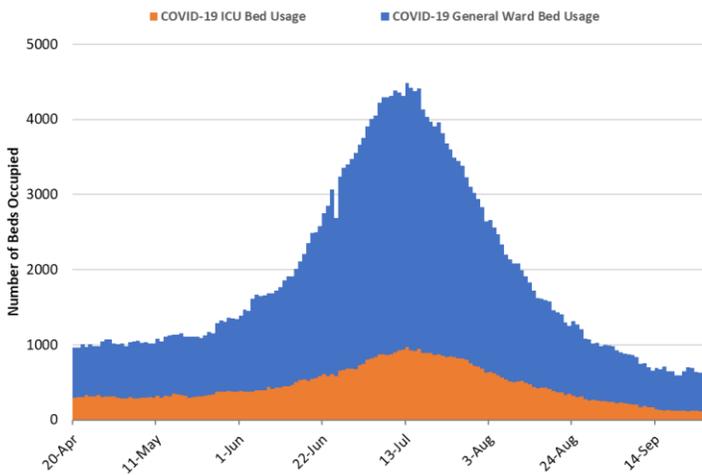


Figure 4. Arizona Daily Covid-19 General Ward and ICU Census April 20 – September 25.

As of September 25th, 624 hospital beds were occupied by patients with suspected or confirmed Covid-19. This number is somewhat lower than the 648 occupied beds reported last week. However, this number may be artificially low because of non-reporting over the past 10 days.

As of September 25th, 509 (7%) of Arizona's 7228 general ward beds were occupied by Covid-19 patients, a 4% decline from last week's 528 occupied beds. However, the total number of hospital beds unexpectedly declined on September 16th by 720 beds, 7948 beds to 7228 beds (see northeast notch Figure 5). If these "missing" beds are due to non-reporting, then some number of Covid-19 occupied beds could be unaccounted for in the state tally. An additional 1518 (21%) beds remain available for use which is higher than last week's 1390 beds.

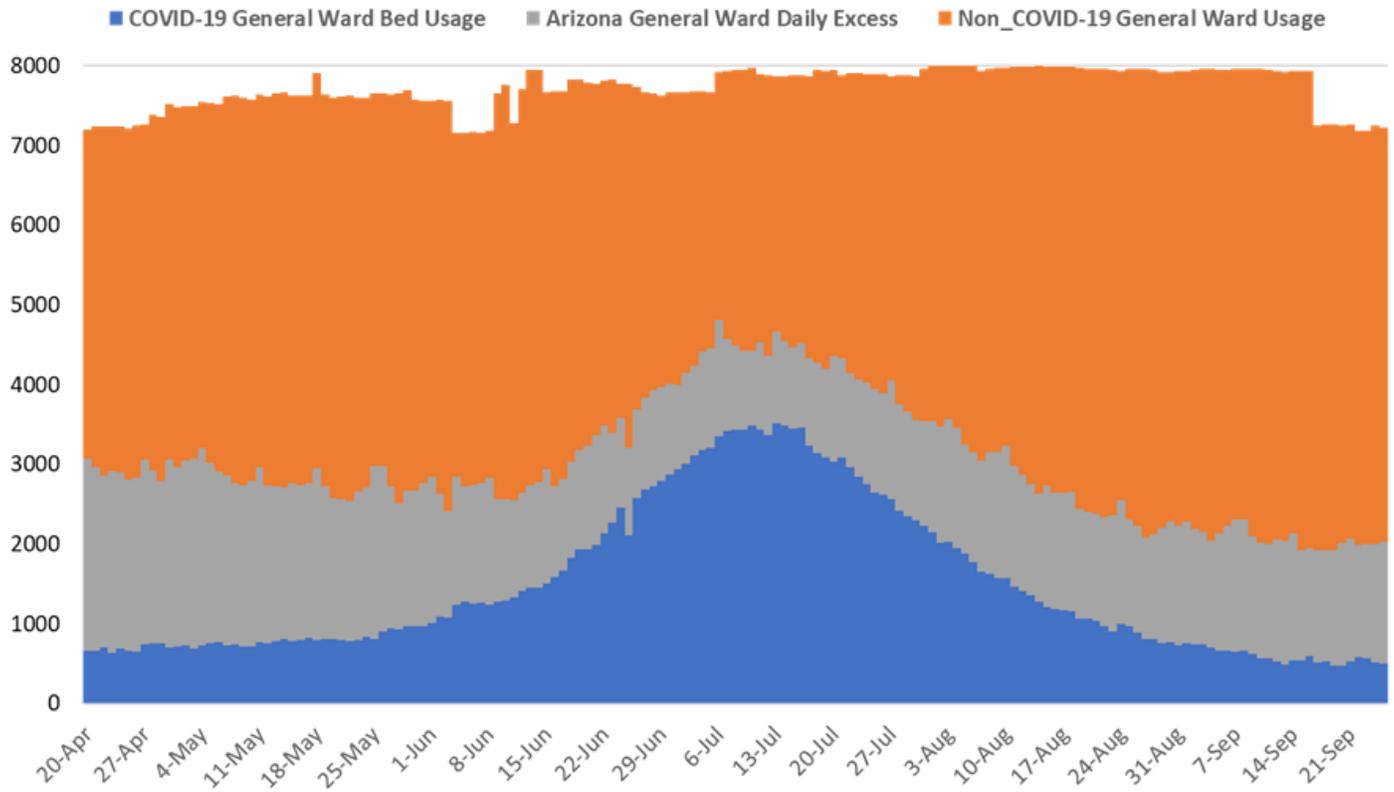


Figure 5. Covid-19, Non-Covid, and Excess General Ward Occupancy April 20 – September 25.

As of September 25th, 115 (7%) of Arizona's 1629 ICU beds were occupied for Covid-19 care, a 4% decrease from last week's 120 occupied beds. The total number of ICU beds has also declined from September 16th, but by a smaller amount, 1656 to 1629 beds. An additional 369 (23%) ICU beds remain available which is similar to last week's 374 beds.

Arizona will not exceed its listed capacity of non-surge general ward or ICU beds unless improvements reverse (Figure 6). State-wide occupancy for general ward beds has been $\geq 80\%$ for the past month presumably to reduce the backlog of patients waiting for elective procedures. Given that seasonal respiratory viruses have not arrived and Covid-19 remains at modest levels, an opportunity exists to attend to non-Covid care.

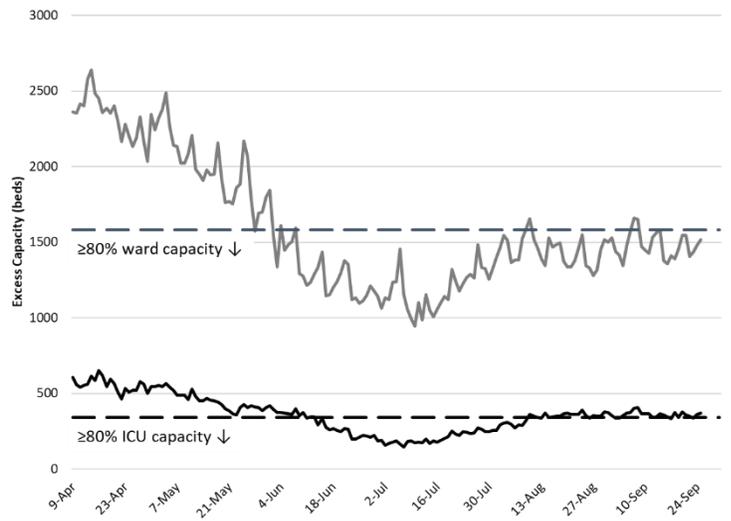


Figure 6. Observed and Projected Excess Non-Surge General Ward and ICU Capacity April 20 – September 31.

With 598 deaths reported to date, the week ending July 19th remains Arizona's deadliest week (Figure 7). Because deaths are declining, we will not see a higher weekly tally for the foreseeable future.

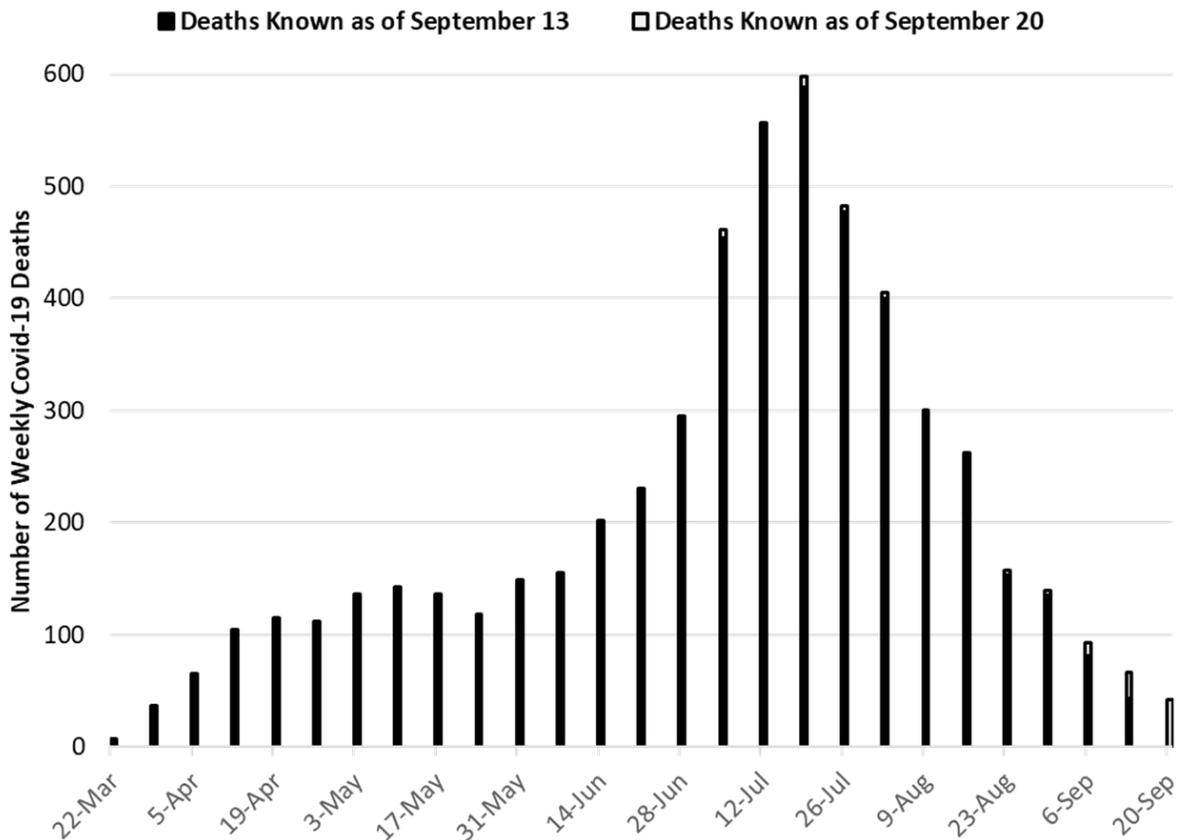


Figure 7. Weekly Arizona Covid-19 Deaths March 1 – September 20.

Pima County Outlook

For the week ending September 13th, 1174 Pima County residents were diagnosed with Covid-19 (Figure 8). This represents 3 weeks of back-to-back increases in the county likely attributable to the return of students to the University of Arizona campus.

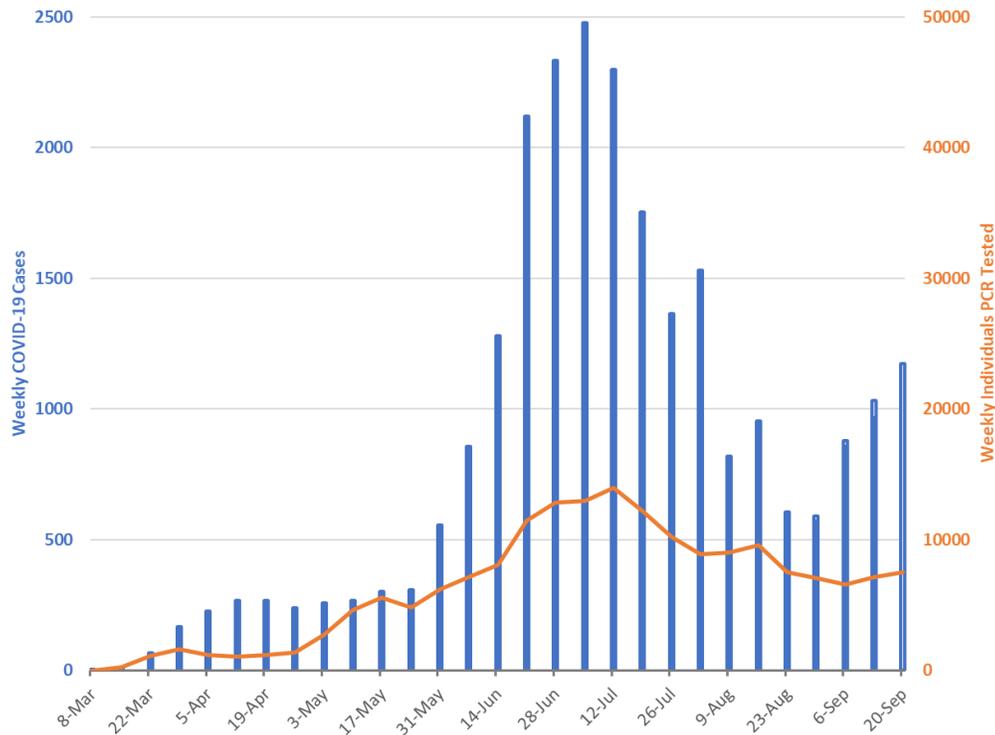


Figure 8. Covid-19 Cases and Individuals PCR Tested in Pima County through September 20.

University Outlook

Both the [University of Arizona](#) and [Arizona State University](#) are reporting aggregate cases. The University of Arizona reports 2291 cases since July 31st which is higher than the 2030 identified this time last week but lower than previous trends. ASU reports 1753 cases since August 1st which is also higher than the 1580 cases reported last week.

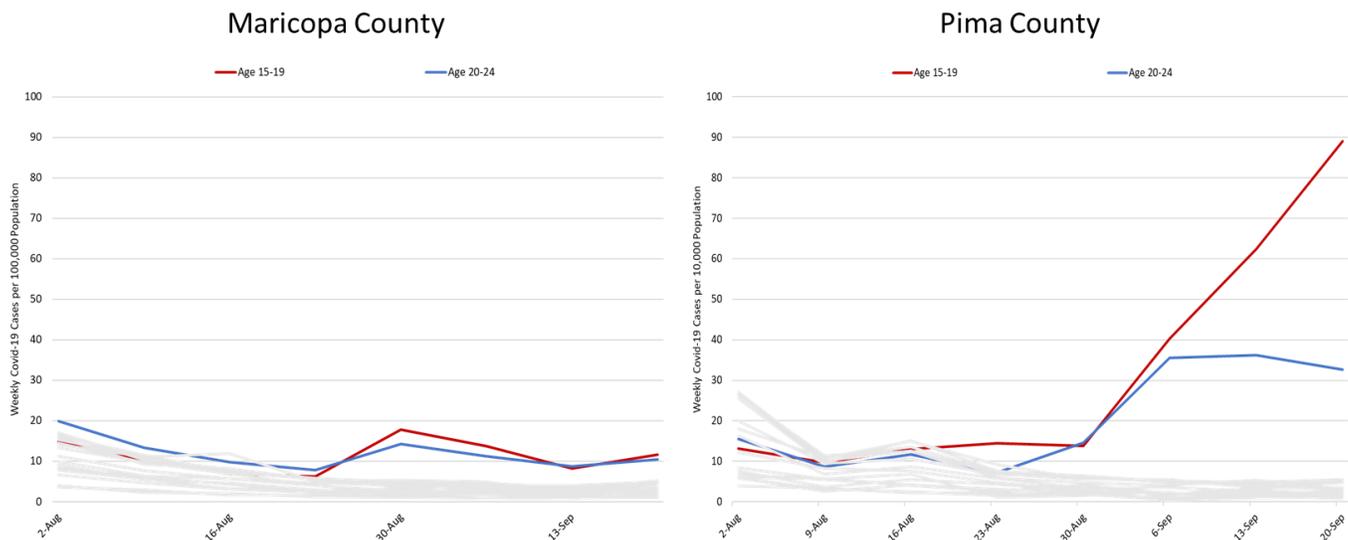


Figure 9. Population-Normed Covid-19 Cases per 10,000 population by Age Group Jul 27 – September 20 in Maricopa and Pima Counties (best viewed in color).

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.

These disparate growth rates are reflected in the county-specific aggregate data (Figure 9 previous page). While Maricopa County experienced an increase in case rates among those 15 – 19 years and 20 – 24 years the last week of August, these rates are now generally declining. However, Pima County experienced a later, a larger, and a more sustained increase its cases rates among these groups. Because the testing strategies may differ between the two campuses, it is difficult to compare these data at face value. Nevertheless, there is now better alignment between the University-reported data and the state data.

The impact of cases on our university campuses is evident in the state-wide data (Figure 10). Population-normed case rates continue to increase among those 15 – 19 and 20 – 24 years of age. However, there is now a noticeable upward inflection among other age groups as well. This raises the concern of “spill-over” from university campuses into the broader community, declining adherence to effective mitigation efforts such as face masks, physical distancing, and/or hand hygiene in the broader community itself (Figure 11 on following page), or both.

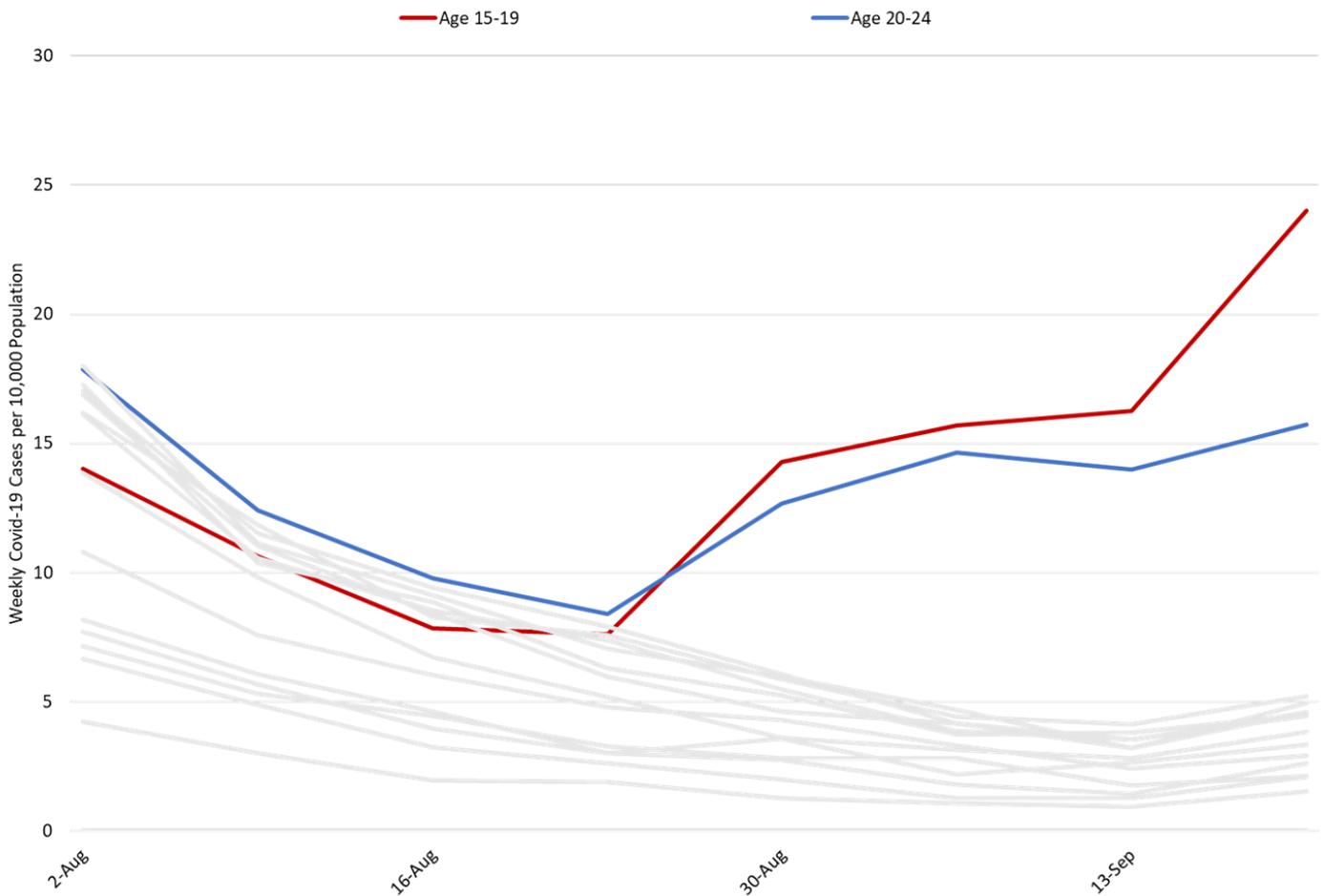


Figure 10. Population-Normed Covid-19 Cases per 10,000 population in Arizona by Age Group March 1 – September 20 (best viewed in color).

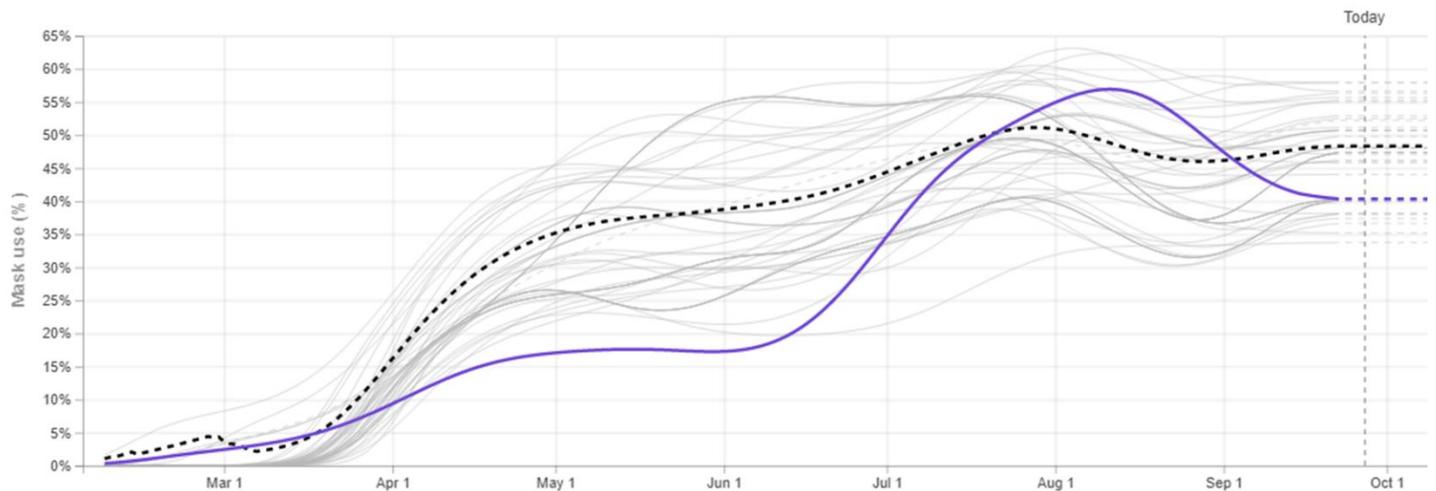


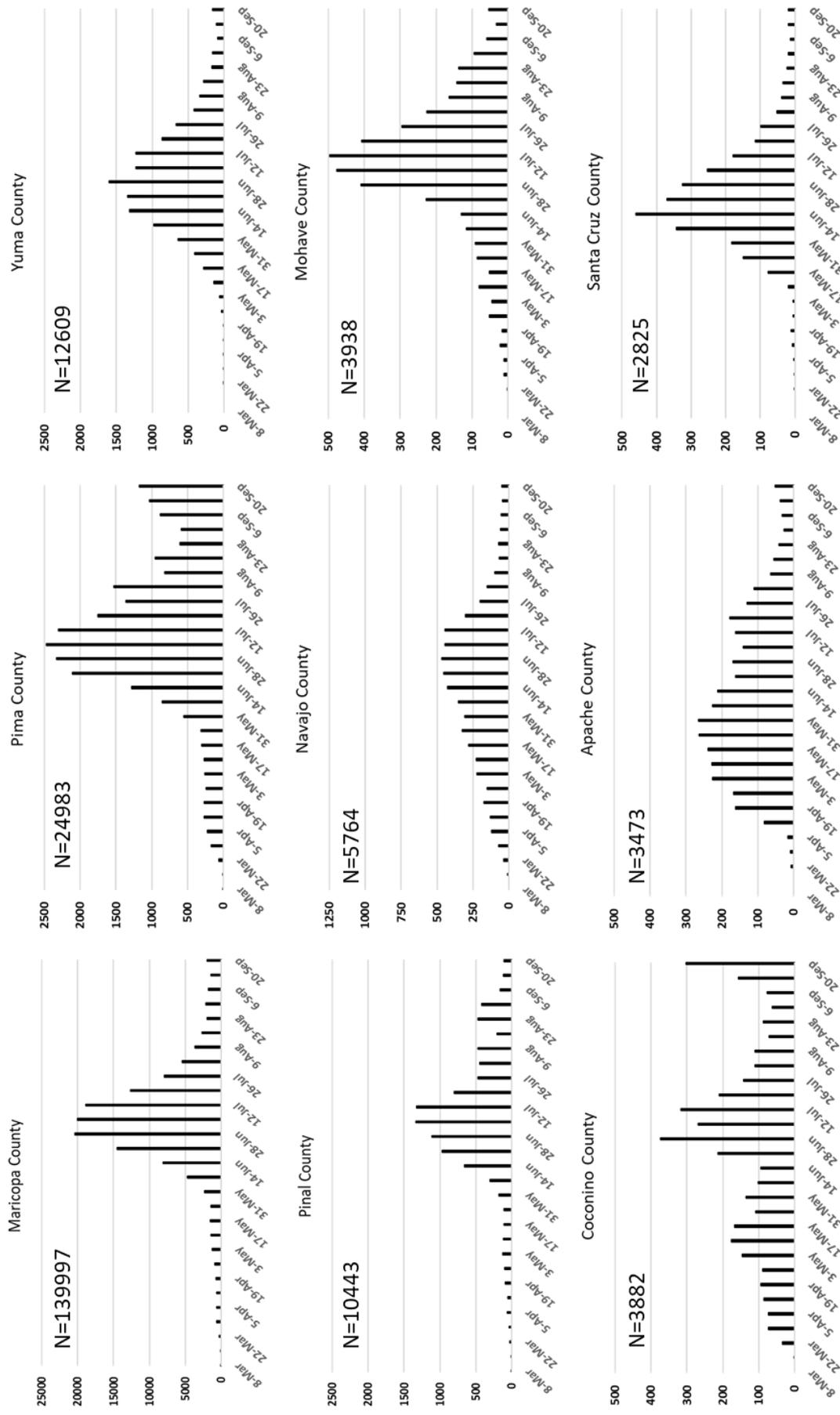
Figure 11. Percent of Arizonans (purple) Reporting Always Wearing a Face-Mask in Public as Compared to the United States (dashed line) and other States (grey lines).

Summary:

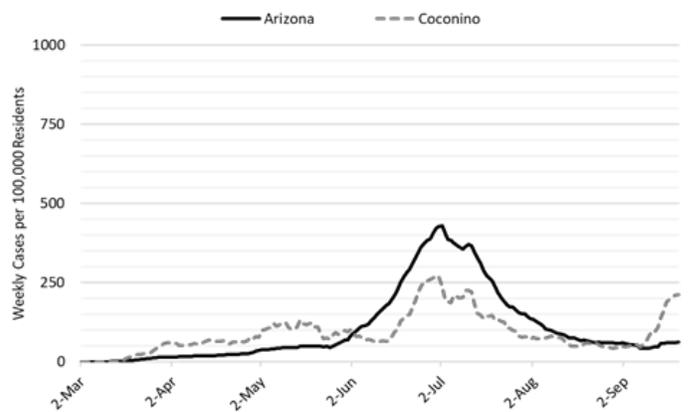
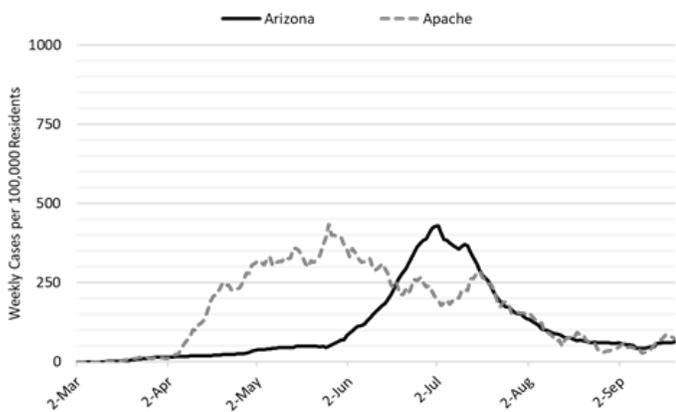
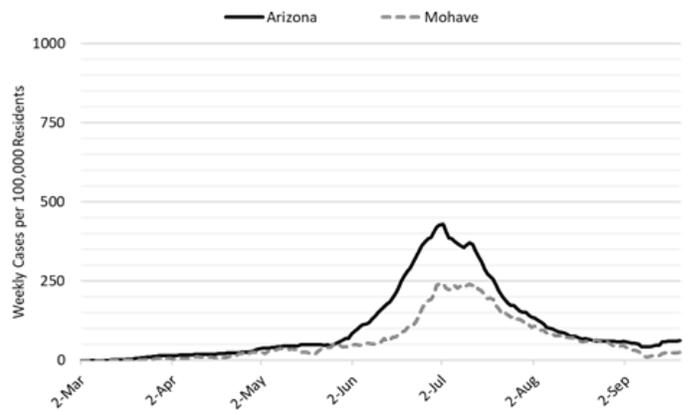
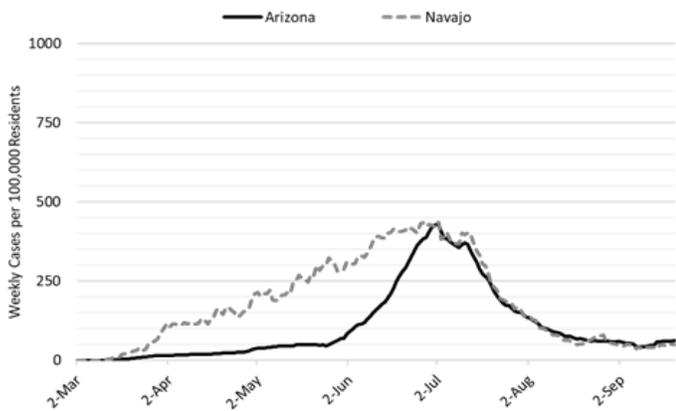
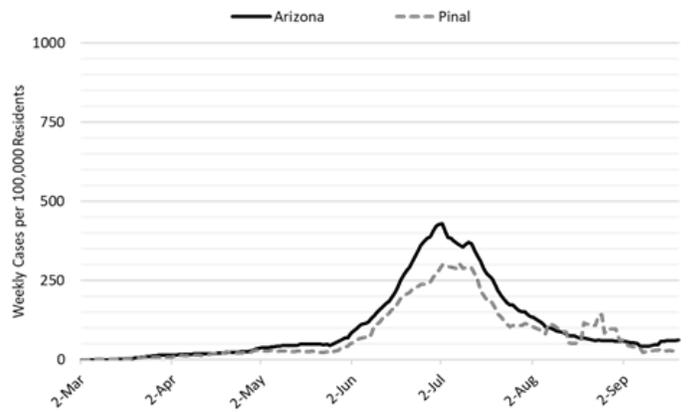
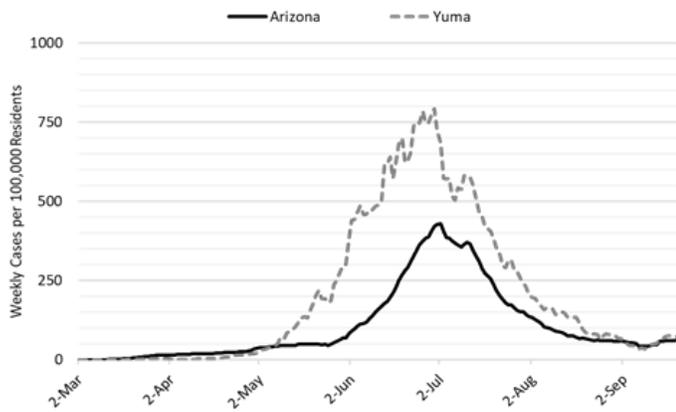
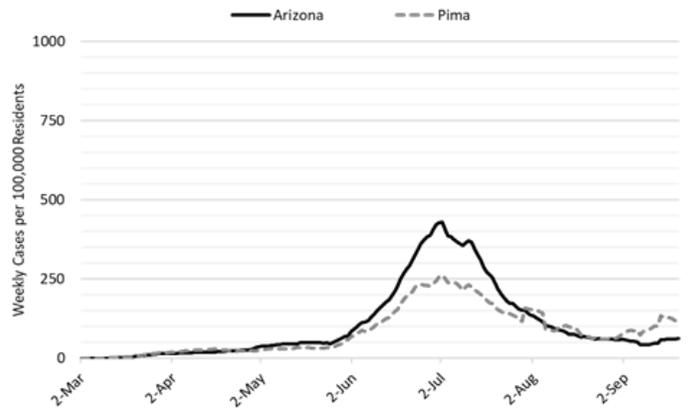
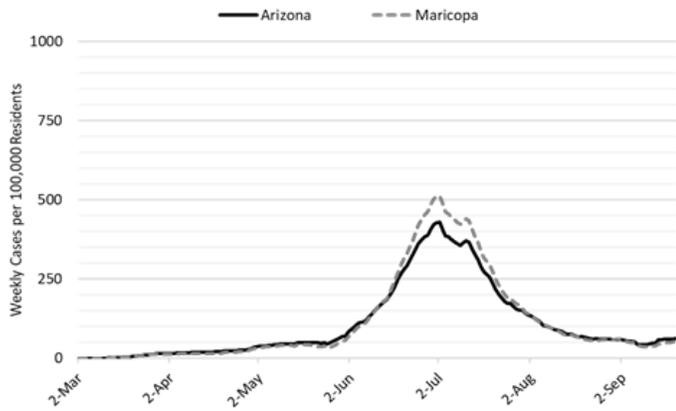
- In a new development, viral transmission is beginning to increase broadly in Arizona, but particularly among university-age individuals in Maricopa, Pima, and Coconino counties.
 - Rising cases on university campuses pose an unknown risk to the broader community as lower adherence to mitigation efforts in the broader community may also be waning.
- Levels of community-driven viral transmission are on par with those observed in mid-to-late May just as Arizona re-opened its broader economy.
 - For all locales, 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.
- While Covid-related hospital utilization is no longer declining, adequate capacity remains available.
 - From now until January, non-Covid hospitalizations are expected to increase putting additional strain on hospital capacity.
- Current Covid-19 test capacity is adequate as evidenced by quick turn-around for PCR results and a PCR test positive percentage of 6% which is near the recommended 3 – 5% threshold.
 - Antigen and saliva testing results generally support trends in case counts; test positivity for these tests are similar to or higher than traditional PCR testing in clinical setting reflecting the higher transmission rates among university populations.

Next update scheduled for October 2.

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

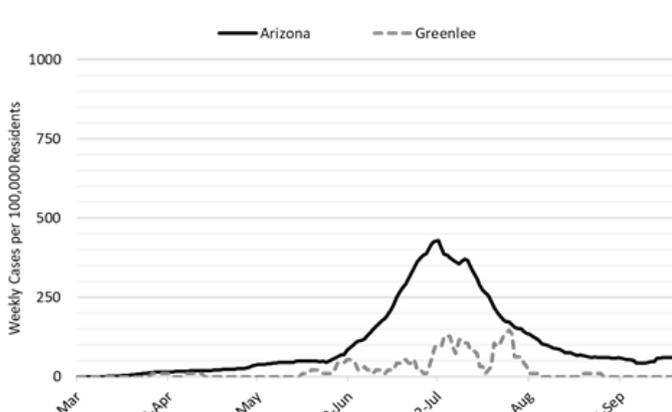
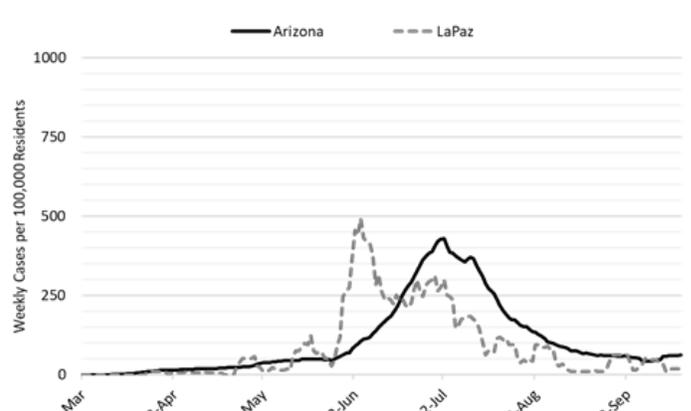
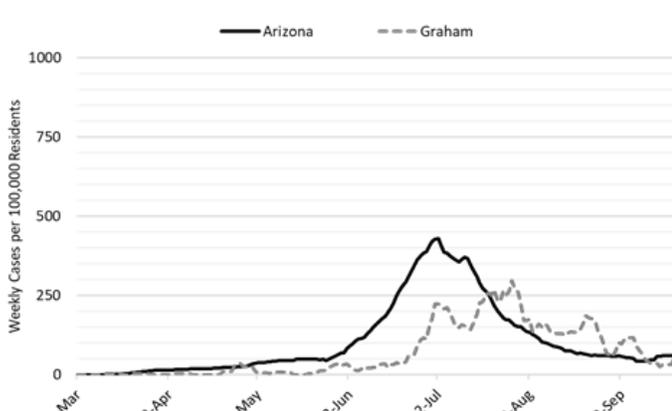
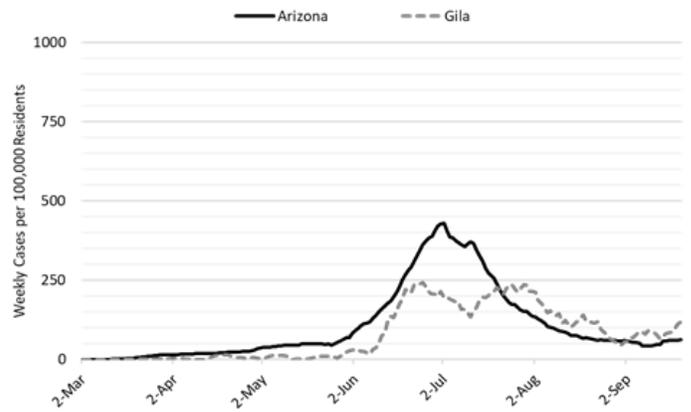
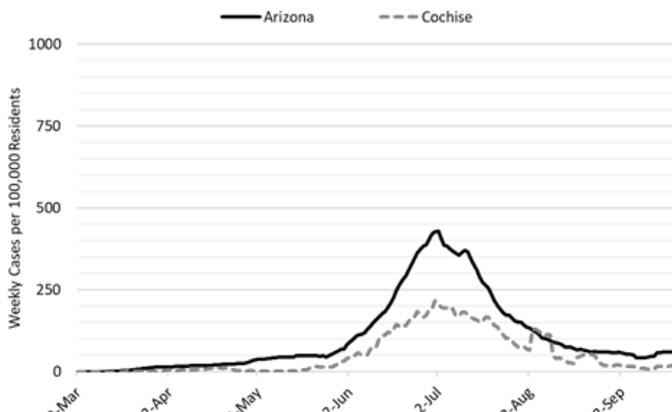
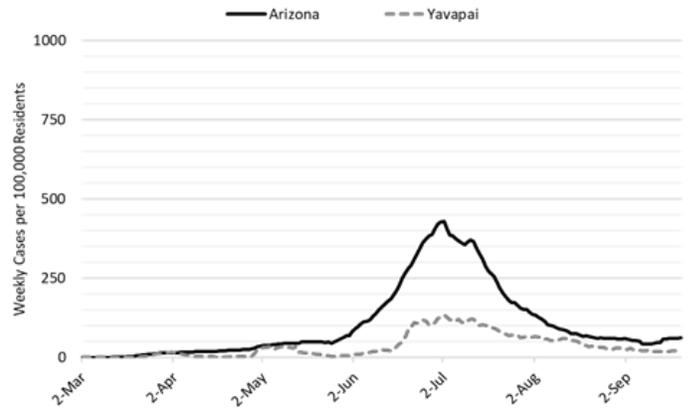
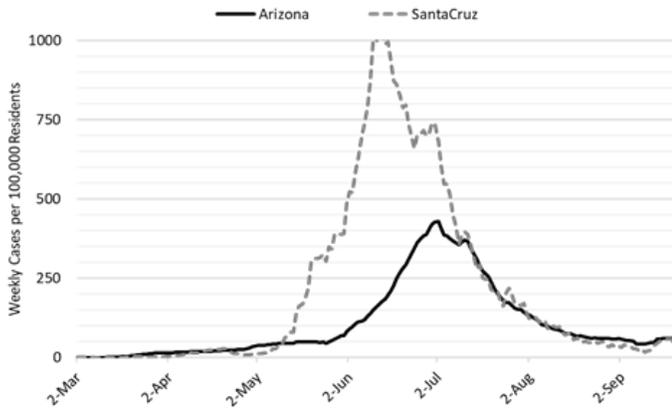


Appendix Figure 1. Weekly Covid-19 Cases by County March 1 – September 20.



Appendix Figure 2. Weekly Covid-19 Cases per 100,000 Residents by County March 1 – Sept 20.

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.



Appendix Figure 2. Weekly Covid-19 Cases per 100,000 Residents by County March 1 – Sept 20.

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