

# Covid-19 Disease Outbreak Outlook

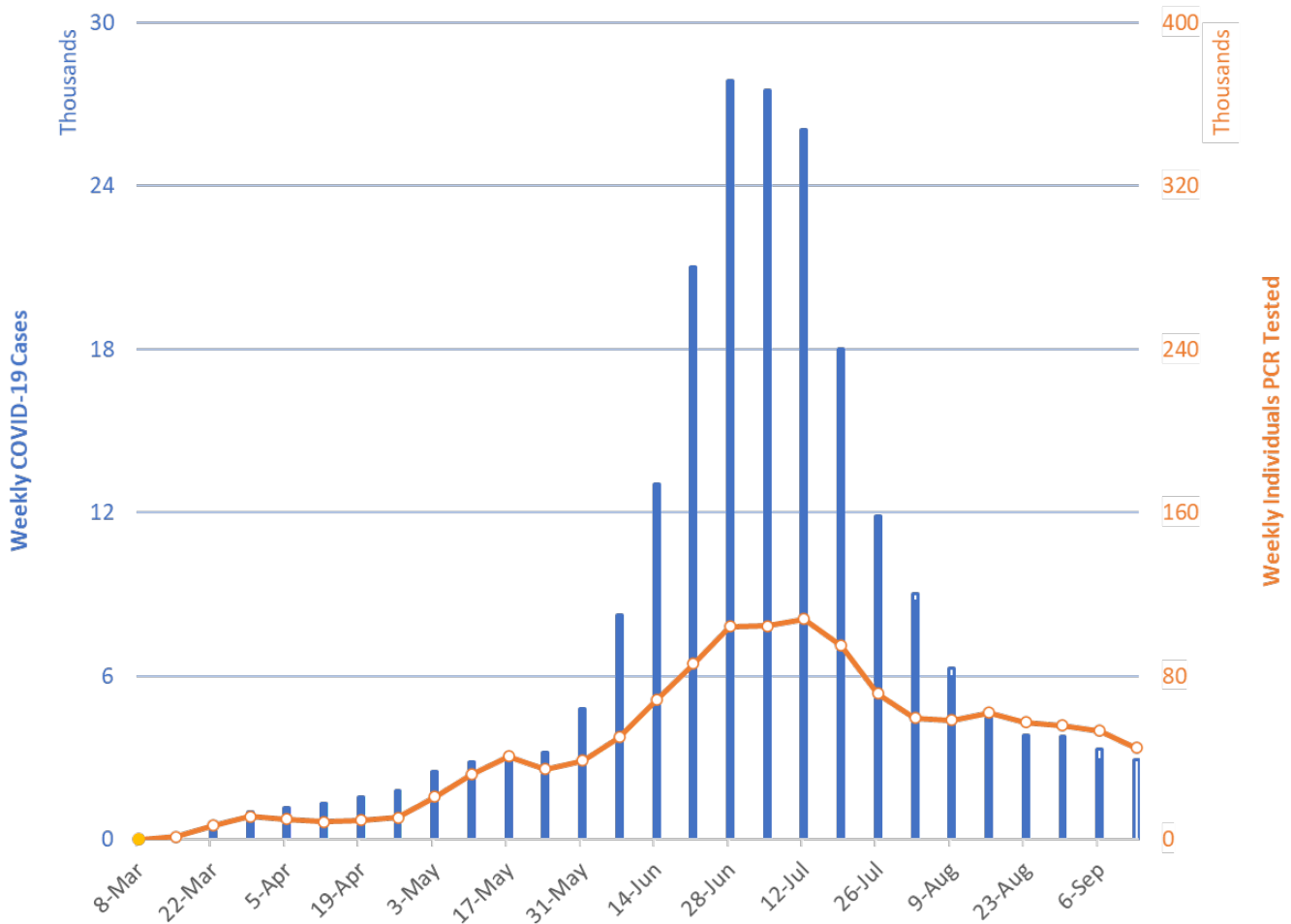
## Arizona State and Pima County

Updated September 18, 2020

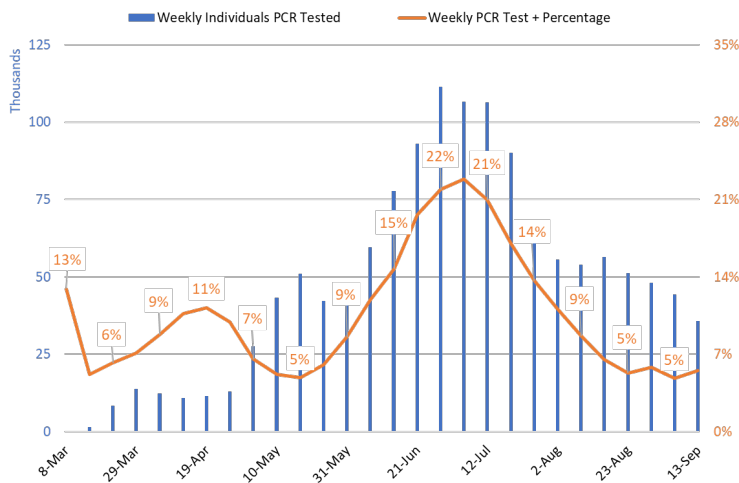
Disclaimer: This information represents my personal views and not those of The University of Arizona, the Zuckerman College of Public Health, or any other government entity. Any opinions, forecasts, or recommendations should be considered in conjunction with other corroborating and conflicting data.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

For the week ending September 13th, 2924 new Covid-19 cases were diagnosed in Arizona (Figure 1). While most PCR tests collected at clinical sites are being reported within 48 hours, it is unclear how consistently saliva and antigen tests being collected by universities are being reported. For example, 1408 newly reported cases were “backfilled” to weeks between July 19 – August 6, many of these likely from university testing.

Because these cases were temporally dispersed, they did not affect state-wide trends. In aggregate, transmission rates continue to decline in Arizona with current levels being roughly comparable to those of mid-May. However, viral transmission among young adults residing on or near university campuses is increasing. Continued adherence to mitigation efforts including face coverings, physical distancing, and hand hygiene are needed to sustain recent improvements and prevent transmission on university campuses from spreading to the wider community.



**Figure 1. Newly Diagnosed Covid-19 Cases in Arizona and Number of Individuals Undergoing PCR Testing March 1 through September 13.**



**Figure 2. Weekly Number Patients PCR Tested and Percent with Positive Test March 1 – September 13.**

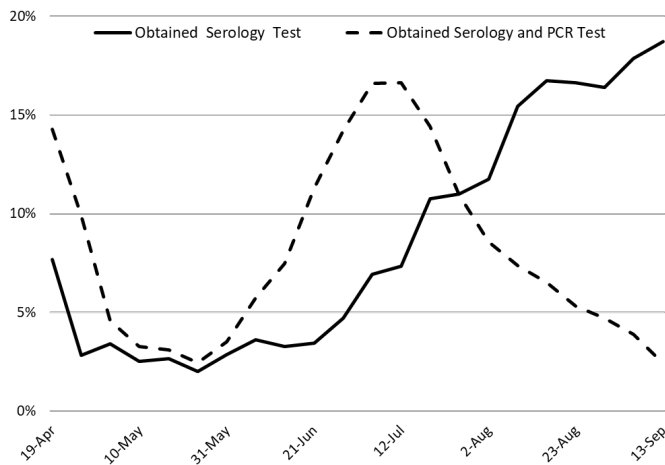
The test positive percentage among patients undergoing PCR testing has remained at or near 5% for the past 4 weeks (Figure 2). This is within the recommended level to support diagnostic and surveillance activities.

Some uncertainty remains regarding university antigen and saliva test reporting, particularly negative results. Hopefully, this issue will be clarified in the coming weeks.

The overall percentage of patients testing positive on the antibody (serology) test has remained stable for the past 8 weeks at 11 - 12%. However, these results are dependent on whether patients only undergo serology testing or simultaneously undergo PCR and serology testing.

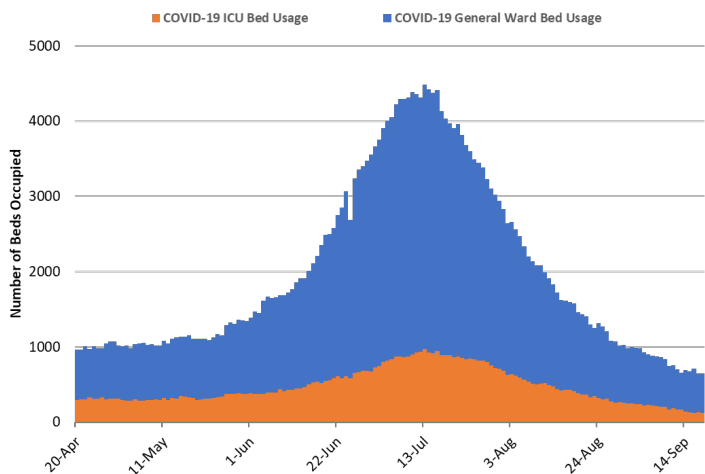
Among those only undergoing serology testing, the test positive percentage was 19% this past week (Figure 3). Among those undergoing both, only 2.4% tested positive. It is difficult to interpret either trend owing to the clear presence of selection bias and indication bias in who is getting tested. In addition, the number of tests being conducted is now <4000 per week. For these reasons, I will no longer be reporting serology results.

As of September 18th, 648 hospital beds were occupied by patients with suspected or confirmed Covid-19. This number is lower than the 767 occupied beds reported when this metric was established on April 9. However, this number may be artificially low because of reporting error or delay in the past several days.



**Figure 3. Weekly Number Patients Undergoing Serology Testing Who Test Positive Stratified by Presence or Absence of Parallel PCR Testing March 1 – September 13.**

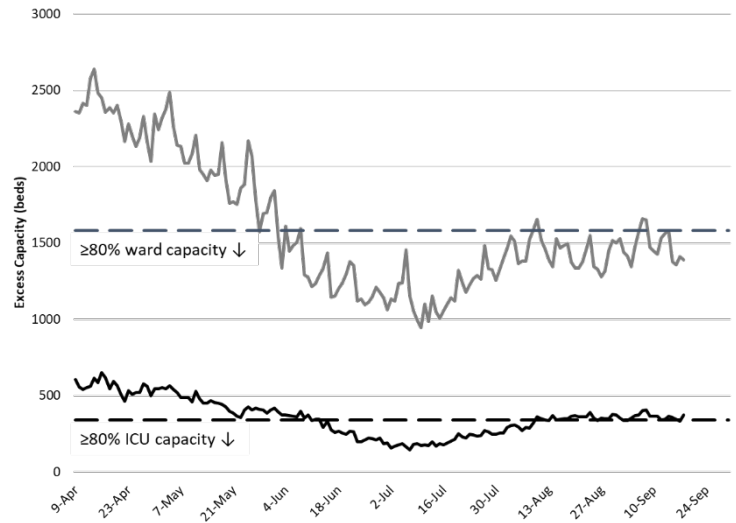
As of September 18th, 528 (7%) of Arizona's 7271 general ward beds were occupied by Covid-19 patients, an 8% decline from last week. However, the total number of hospital beds declined by a similar percentage, 7948 beds to 7271 beds. Furthermore, the percentage of beds occupied by Covid-19 patients remained stable at 7%. These data suggest some hospitals have not reported data. An additional 1390 (19%) beds remain available which is lower than last week's 1427 beds, but this could also be impacted by reporting errors.



**Figure 4. Arizona Daily Covid-19 General Ward and ICU Census April 20 – September 18.**

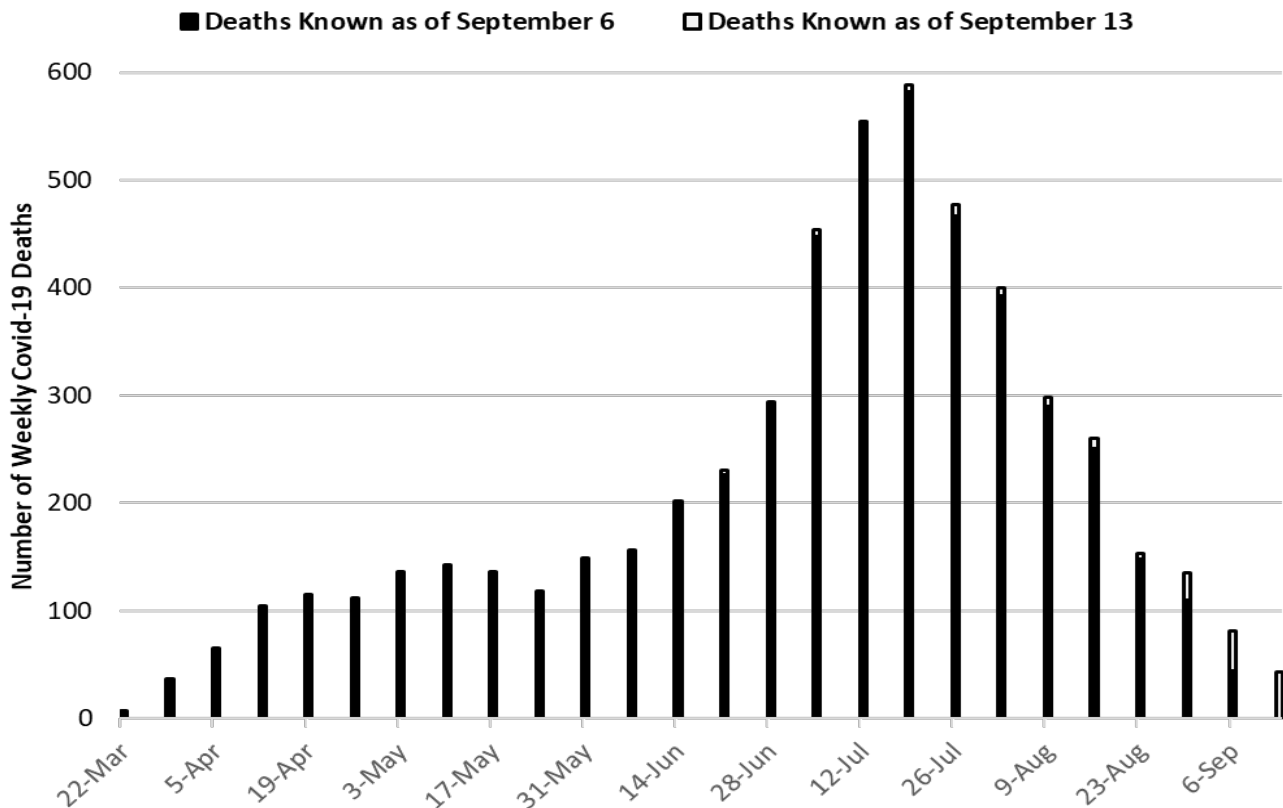
As of September 18th, 120 (7%) of Arizona's 1654 ICU beds were occupied for Covid-19 care, a 35% decrease from last week's 185 occupied beds. Given that the total number of ICU beds did not appreciably change between this week and last, 1654 beds versus 1663 beds, the reporting errors, if present, seem confined to ward beds. An additional 374 (23%) ICU beds remain available which is higher than last week's 367 beds.

Arizona will not exceed its listed capacity of non-surge general ward or ICU beds unless improvements reverse (Figure 5). 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 yet arrived and Covid-19 remains at modest levels, the next 4 weeks presents an opportunity to attend to postponed care.



**Figure 5. Observed and Projected Excess Non-Surge General Ward and ICU Capacity April 20 – September 31.**

With 588 deaths reported to date, the week ending July 19th remains Arizona's deadliest week (Figure 6). Because deaths are declining, we will not see a higher weekly tally for the foreseeable future.



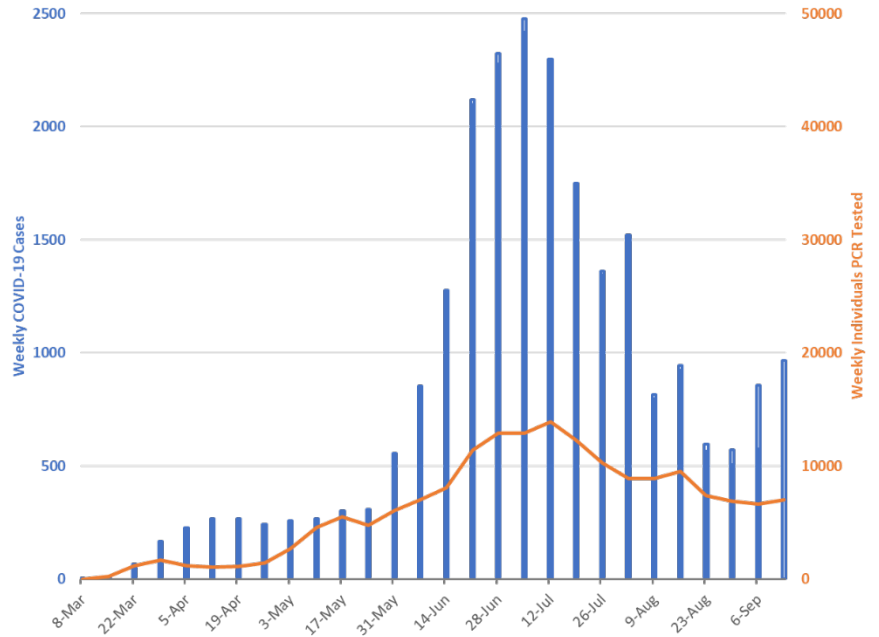
**Figure 6. Weekly Arizona Covid-19 Deaths March 1 – September 13.**

## Pima County Outlook

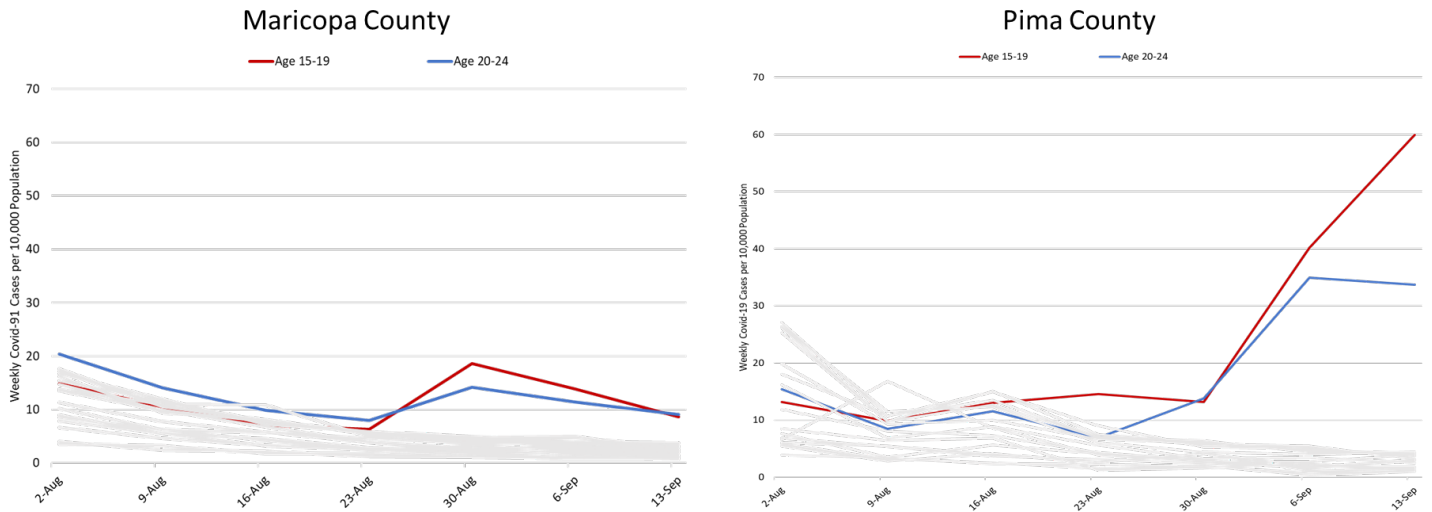
For the week ending September 13th, 967 Pima County residents were diagnosed with Covid-19 (Figure 7). This represents 2 weeks of back-to-back increases in the county likely attributable to testing on the University of Arizona campus.

## University Outlook

Both the [University of Arizona](#) and [Arizona State University](#) are reporting aggregate cases. The University of Arizona reports 2030 cases since July 31<sup>st</sup> which is about twice last week's tally of 1148 cases and quadruple the 480 case count in the previous week. ASU reports 1580 cases since August 1st which is higher than the 1384 cases reported last week and the 957 case count reported the week before that.



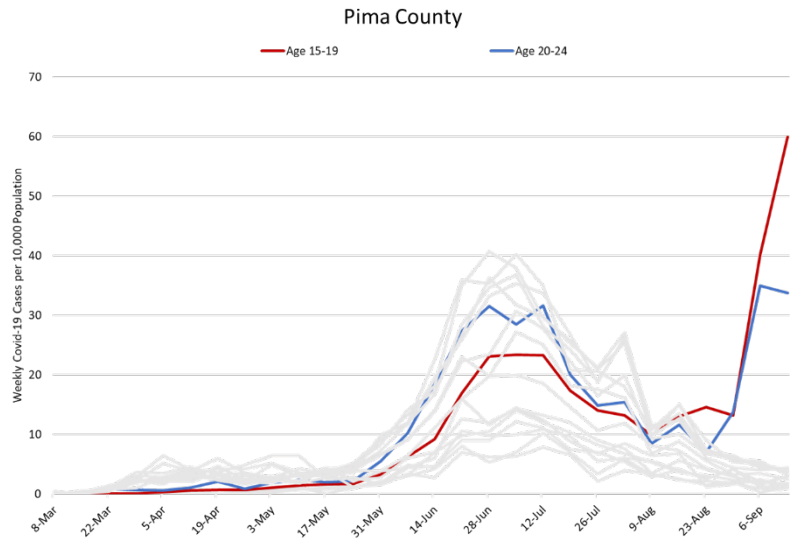
**Figure 7. Newly Diagnosed Covid-19 Cases in Pima County and Individuals PCR Tested through September 13.**



**Figure 8. Population-Normed Covid-19 Cases per 10,000 population by Age Group Jul 27 – September 13 in Maricopa and Pima Counties (best viewed in color).**

These disparate growth rates are reflected in the county-specific aggregate data (Figure 8). 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 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. Because these increases remain concentrated among those 15 – 24 years, there is no evidence of spill-over into the larger community.

It should also be noted that Universities are conducting surveillance and outbreak testing. Therefore, some increase was expected; however, if these increases are sustained over time, then uncontrolled viral transmission will be substantiated. The potential rates of transmission among these highly concentrated age strata in Pima County are comparable to those seen at the peak of the outbreak in July (Figure 9). Again, the more aggressive testing, particularly at the University of Arizona is identifying cases (e.g., asymptomatic) that would not have been identified by clinical testing during the July outbreak.



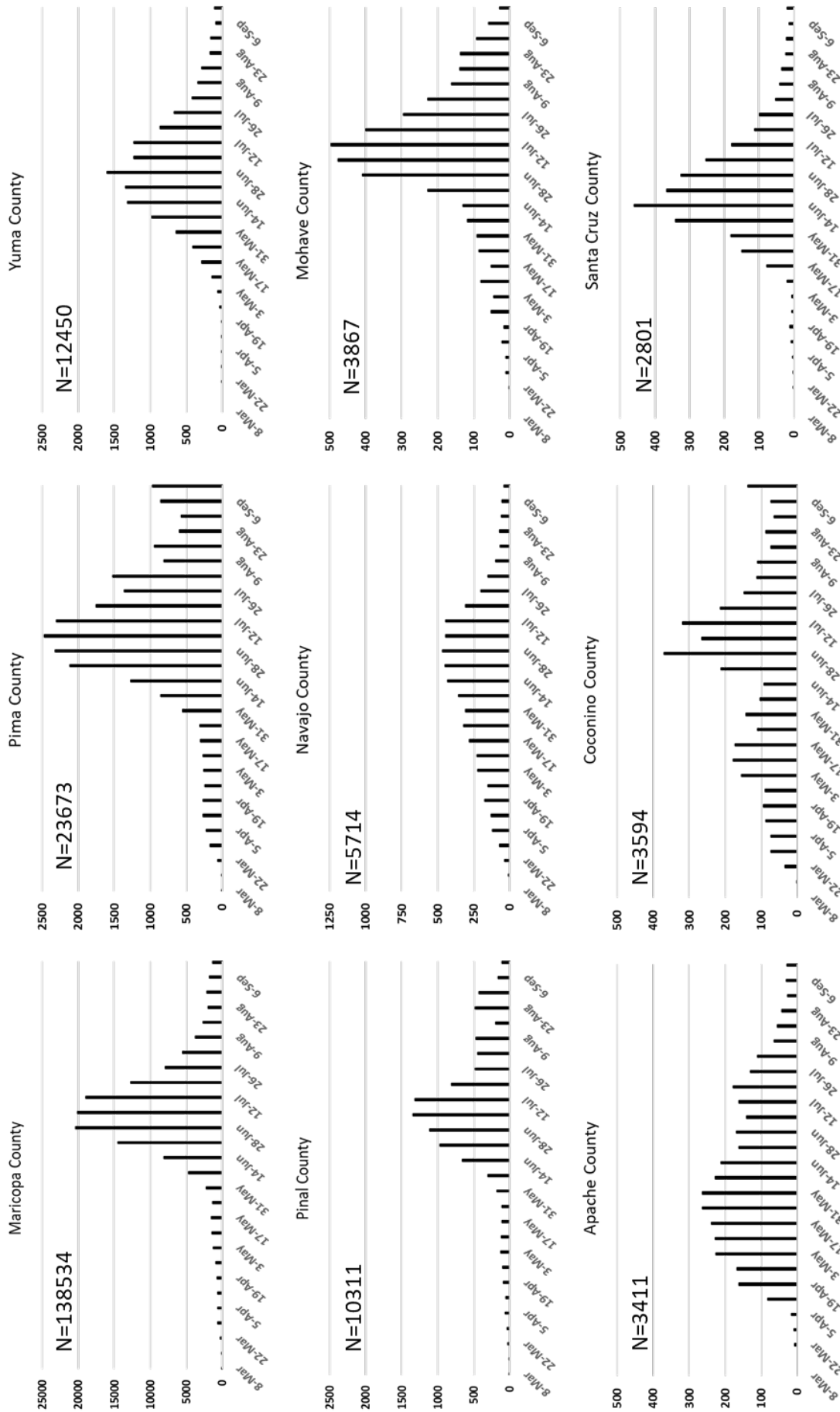
**Figure 9. Population-Normed Covid-19 Cases per 10,000 population by Age Group March 1 – September 13 in Pima County (best viewed in color).**

**Summary:**

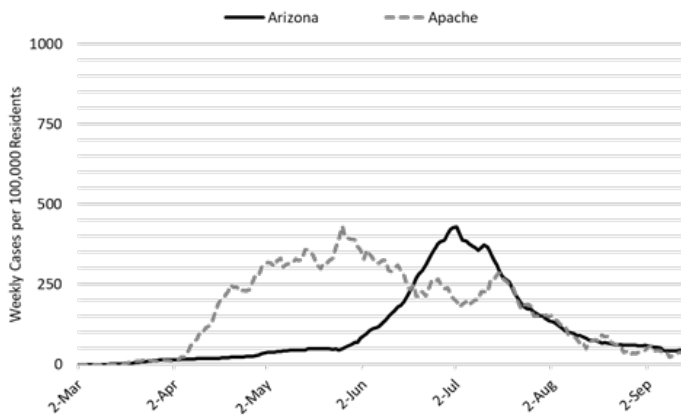
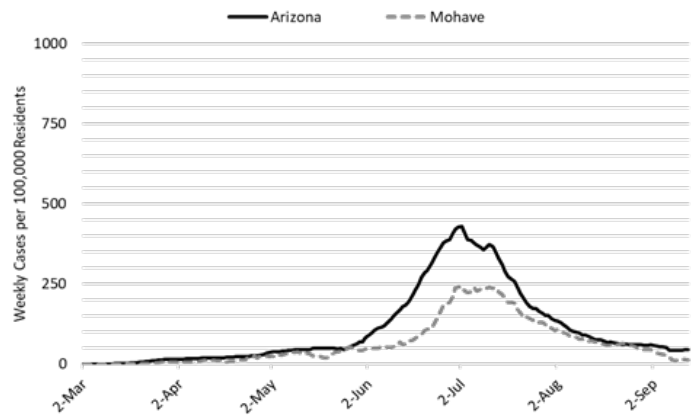
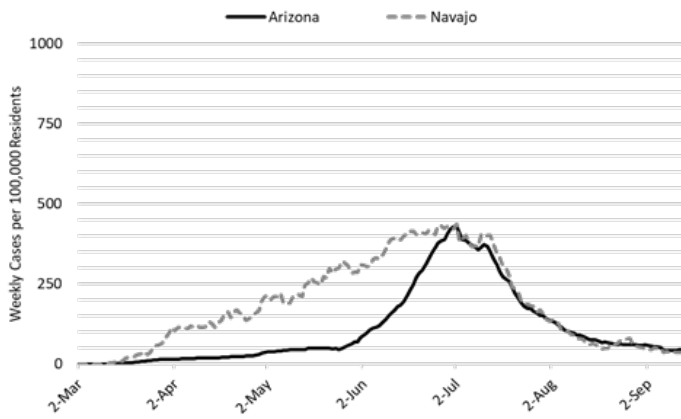
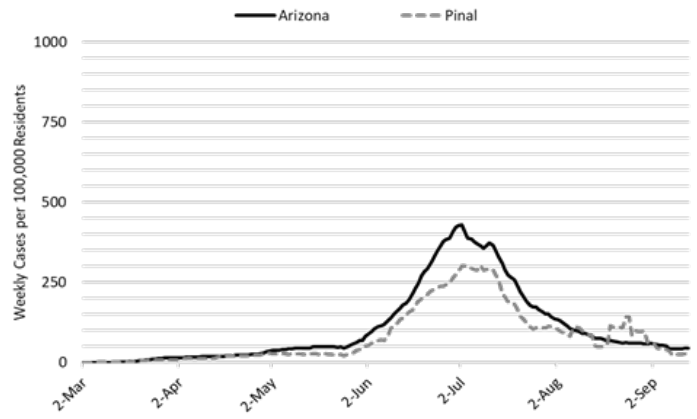
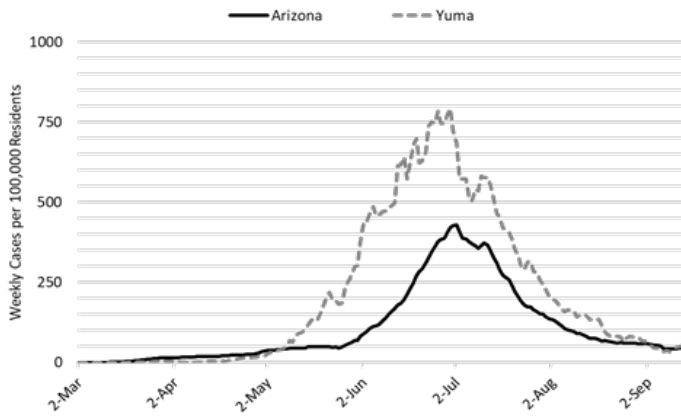
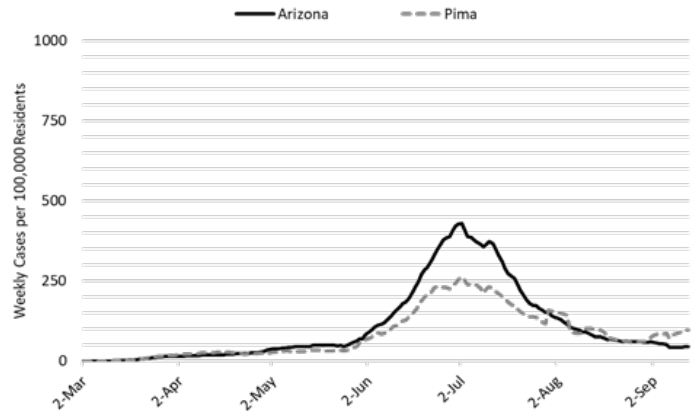
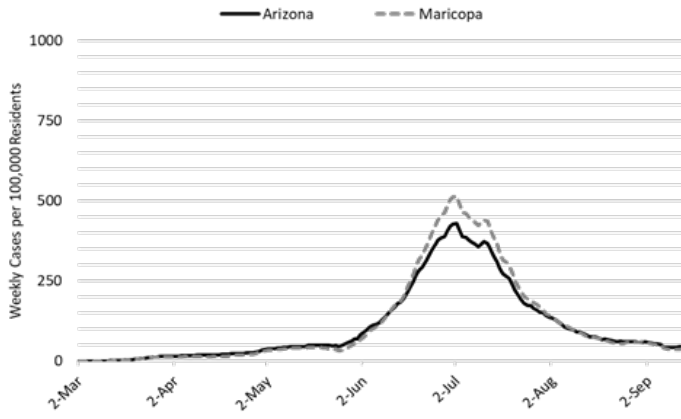
- Except for university campuses, viral transmission continues to decline in Arizona.
  - Rising cases on university campuses pose an unknown risk to the broader community as it is unclear to what extent that the social networks of students and the broader community overlap.
- Outside of young adults, levels of community-driven viral transmission are on par with those observed in early-May just before 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.
- Covid-related hospital utilization continues to decline while excess capacity is not being replenished owing to larger amounts of non-Covid care. However, adequate capacity remains available.
  - From now until January, non-Covid hospitalizations are expected to increase putting additional strain on hospital capacity.
  - Hospitals will continue to experience large volumes of elective care to address the backlog of patients awaiting elective procedures.
- 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.
  - Some uncertainty remains regarding saliva and antigen test reporting in Arizona; hopefully, this will be clarified soon.

Next update scheduled for September 25.

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



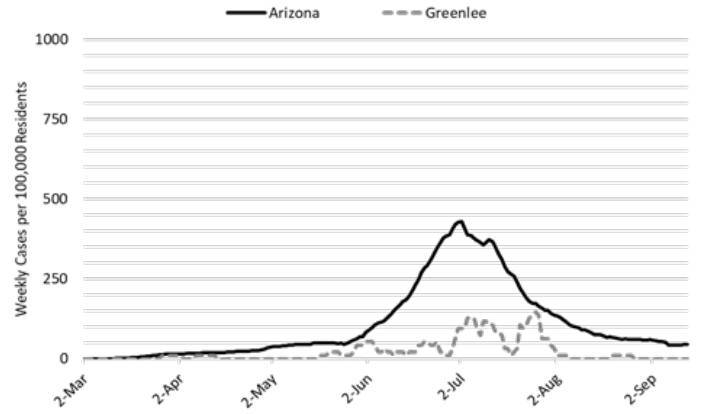
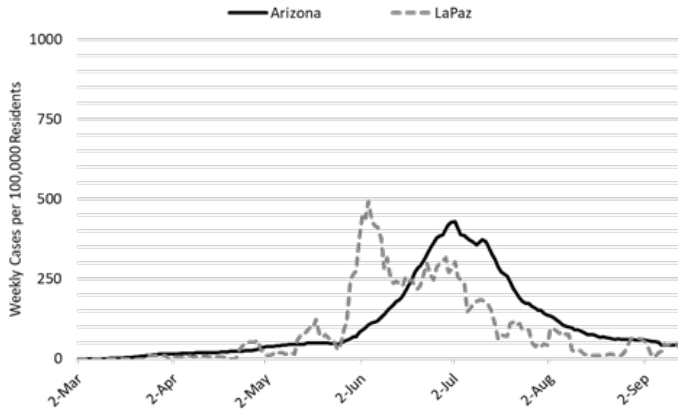
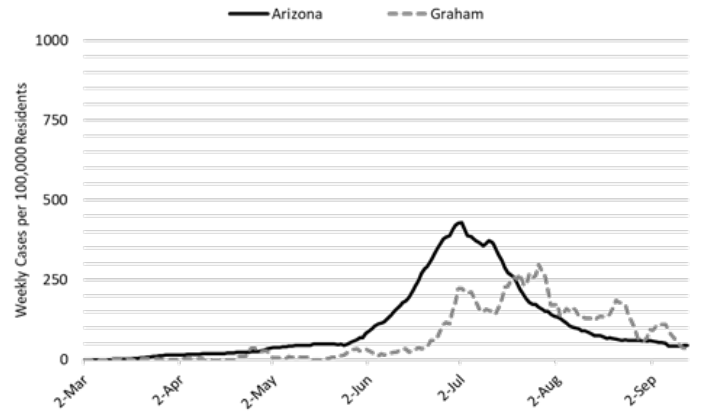
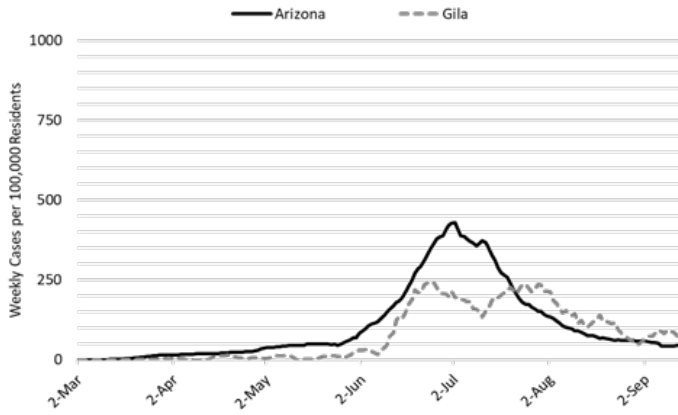
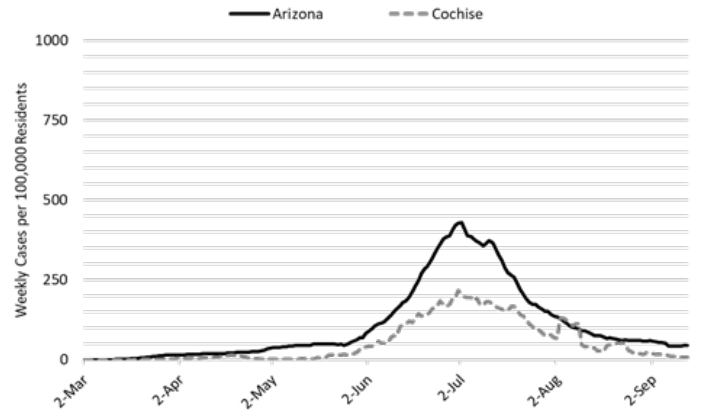
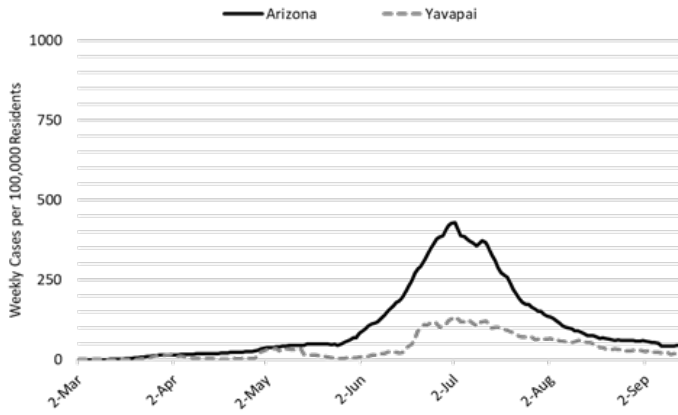
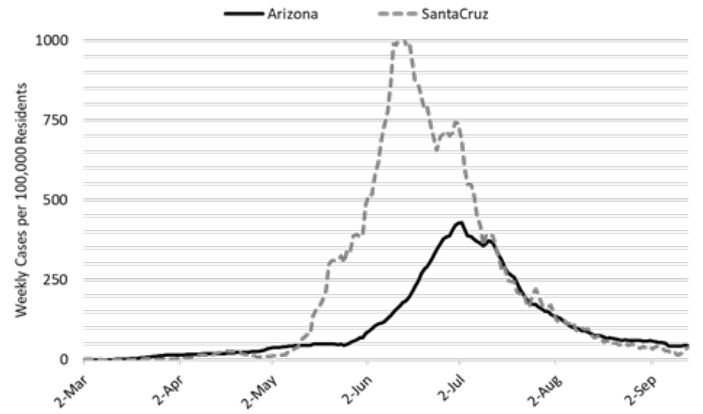
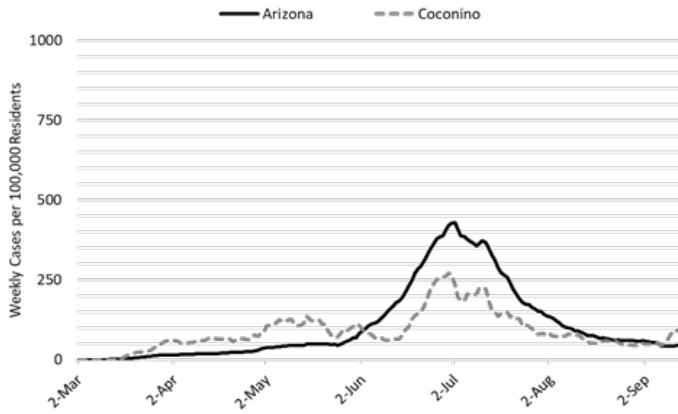
**Appendix Figure 1. Weekly Covid-19 Cases by County March 1 – September 13.**



**Appendix Figure 2. Weekly Covid-19 Cases per 100,000 Residents by County March 1 – Sept 6.**

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 6.**

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.