Covid-19 Disease Outbreak Outlook
Arizona State and Pima County
Updated September 11, 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 6th, 2935 new Covid-19 cases were diagnosed in Arizona (Figure 1). While >90% of nasopharyngeal PCR results are being reported within 48 hours, the expansion of saliva testing on university campuses has yet to be fully automated. Therefore, some backfill of recent tallies in the weeks ahead remains a possibility. For example, last week's tally was revised upwards by 5%, 3535 to 3725 cases.

With this week's tally, viral transmission appears to be broadly waning again in Arizona. Because results from university saliva testing may not be fully tabulated, improvements among university students is less certain. Current overall rates are comparable to mid-May indicating the risk of viral transmission remains relatively high.

The percent of patients testing PCR positive has declined from a peak of 23% the week ending July 25th to 4% the week ending September 6th (Figure 2 following page). This test positive percentage is within the recommended level necessary to support diagnostic and surveillance activities. The percent of patients testing positive on the antibody (serology) test has remained stable for the past 8 weeks at 11 - 12%.

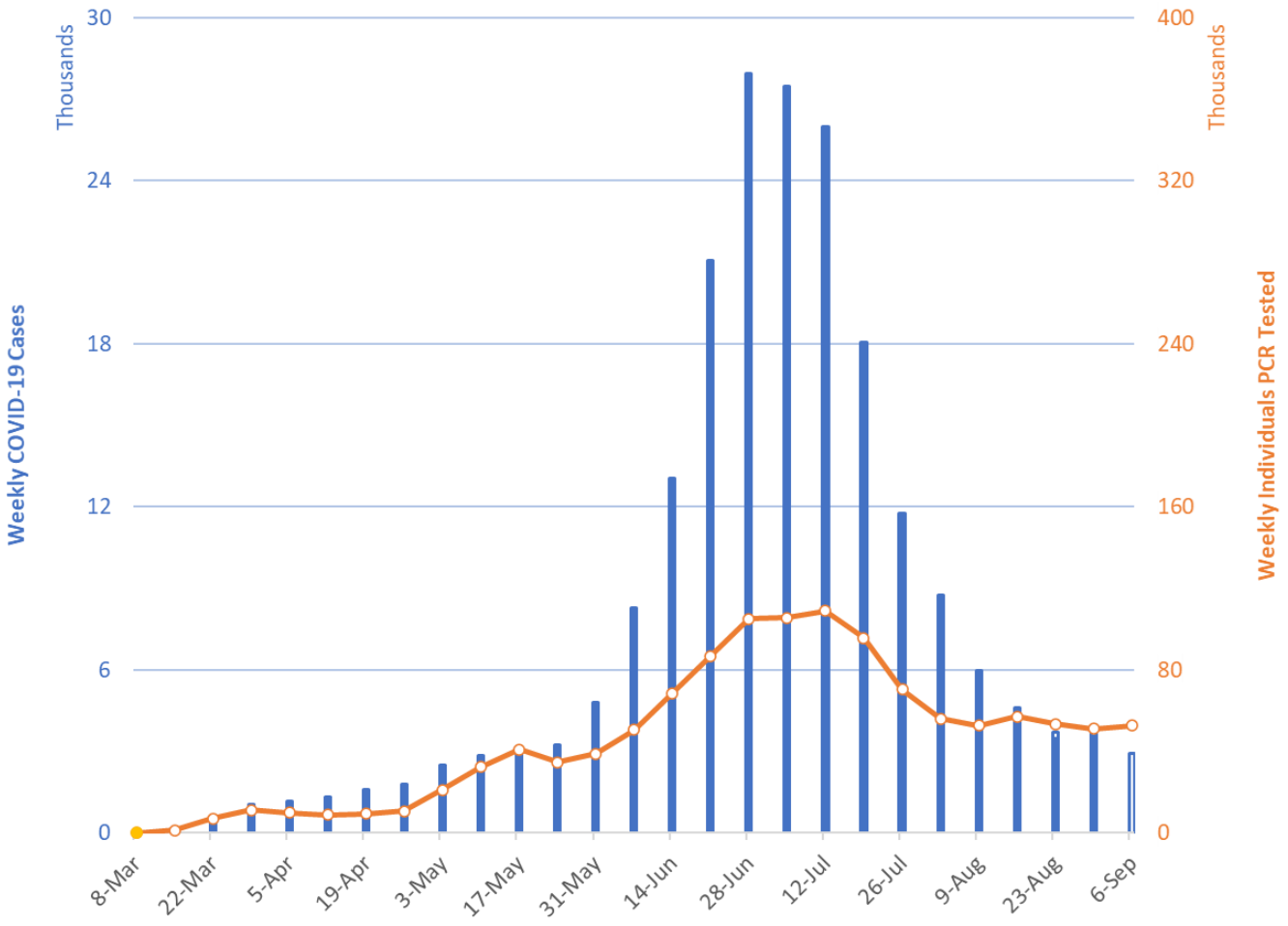

Figure 1. Newly Diagnosed Covid-19 Cases in Arizona and Number of Individuals Undergoing PCR Testing March 1 through September 6.

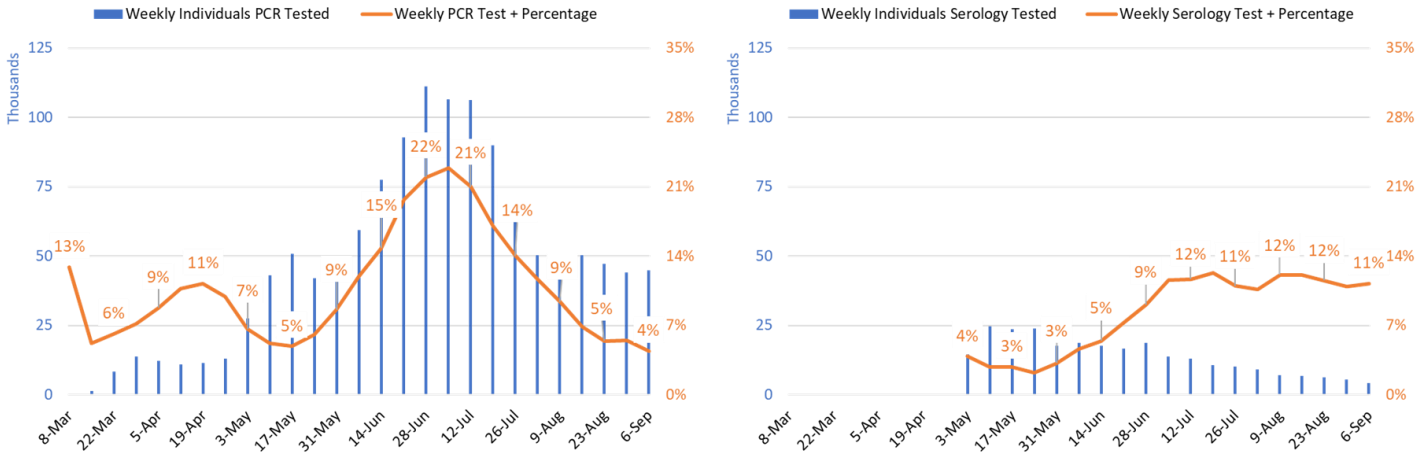

Figure 2. Weekly Number Patients Tested and Percent of Individuals with Positive Covid-19 PCR and Serology Results March 1 – September 6.

As of September 11, Covid-19 hospitalizations are below levels of the May 22nd plateau, 759 versus 1093 occupied beds (Figure 3). Since last week, Covid-19 hospitalizations have decreased 18% from 927 to 759 occupied beds.

As of September 11th, 574 (7%) of Arizona's 7948 general ward beds were occupied by patients with suspected or confirmed Covid-19 infection, a 18% decline from last week. An additional 1427 (18%) beds remain available which is higher than last week's 1344 beds.

Similarly, 171 (11%) of Arizona's 1663 ICU beds were occupied for Covid-19 care, a 24% decrease from last week. An additional 367 beds (22%) beds remain available which is higher than last week's 352 beds.

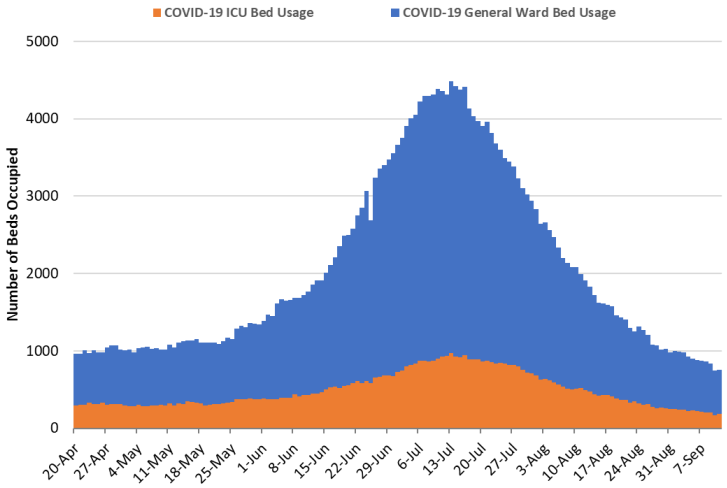

Figure 3. Arizona Daily Covid-19 General Ward and ICU Census April 20 – September 11.

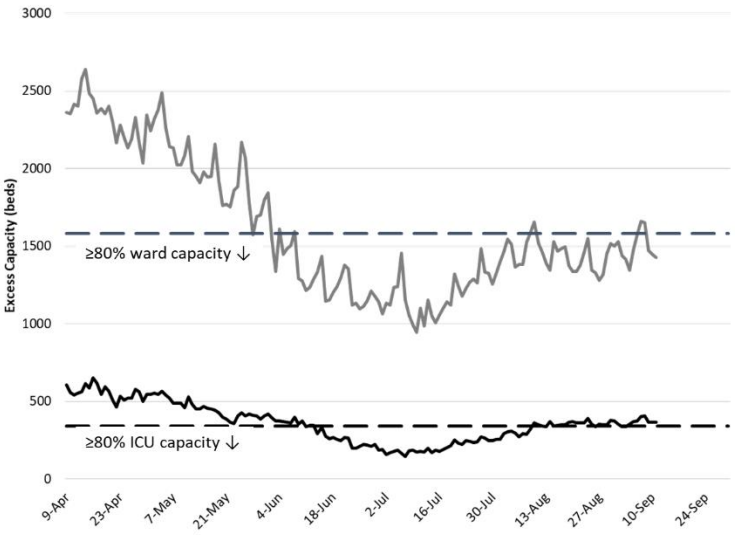

Figure 4. Observed and Projected Excess Non-Surge General Ward and ICU Capacity April 20 – September 31.

Arizona will not exceed its listed capacity of non-surge general ward or ICU beds unless improvements reverse (Figure 4). State-wide occupancy for general ward beds has been ≥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 – 6 weeks presents an opportunity to attend to postponed care.

ICU occupancy continues to hover at 80% occupancy, presumably for similar reasons. It will likely take several months before the backlog of care is fully resolved. However, we must also be concerned about the background rate of non-Covid-19 hospitalizations increasing as we move toward the late-fall, early-winter months.

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.

With 582 deaths reported to date, the week ending July 19th remains Arizona's deadliest week (Figure 5). Because deaths are declining, we will not see a higher weekly tally for the foreseeable future.

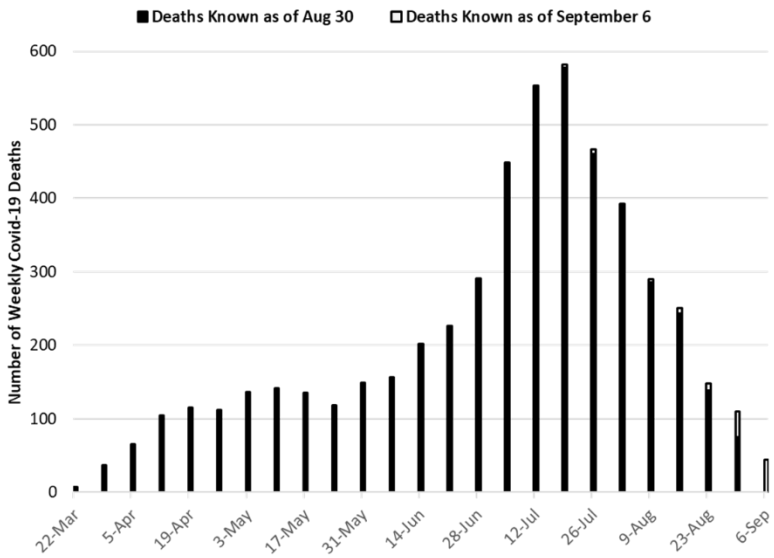

Figure 5. Weekly Arizona Covid-19 Deaths March 1 – September 6 by Date of Death

Pima County Outlook

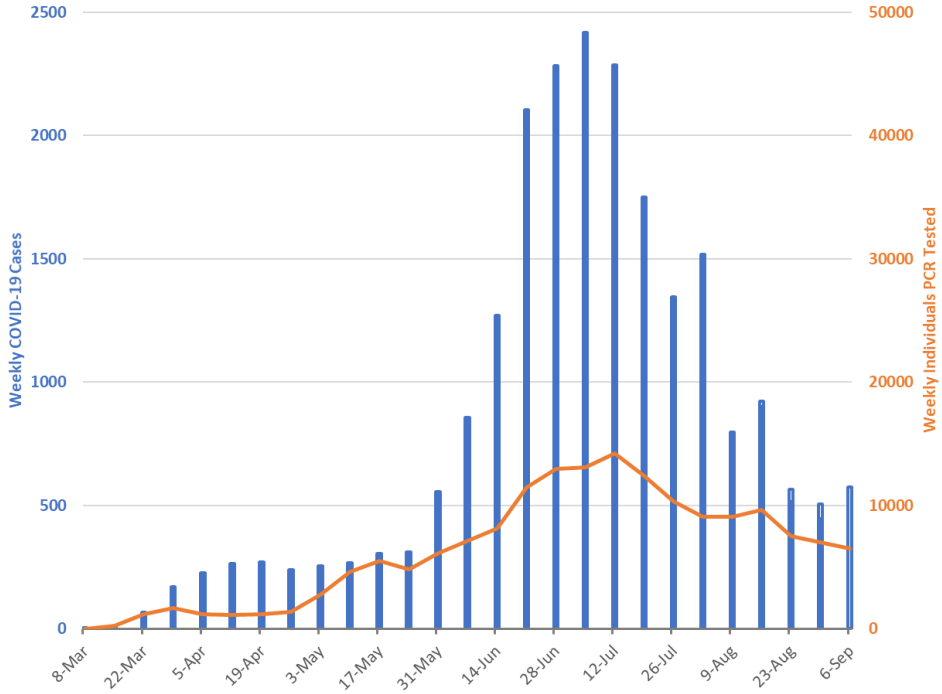

Figure 6. Newly Diagnosed Covid-19 Cases in Pima County and Individuals PCR Tested through September 6.

For the week ending September 6th, 575 Pima County residents were diagnosed with Covid-19. This is a 14% increase from the 506 cases identified the week ending August 30th (Figure 6). There is reason to believe this number could increase if additional saliva results are updated next week.

PCR reporting has improved in Pima County such that ≥90% of results are reported within 48 hours; however, the county continues to struggle with unusual reporting trends owing to the ramp up of saliva testing.

The overall trend is no longer downward. The pace of viral transmission in Pima County appears to be increasing likely due to events unfolding on the University of Arizona campus.

Changing Nature of Arizona's Covid-19 Outbreak

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All of Arizona's major university's returned students to campus in mid-to-late August. Doing so increased the frequency and intensity of social interactions for structural (e.g., congregate living) and behavioral (e.g., social gatherings) reasons. Even with strong mitigation measures and testing, these conditions were/are likely to facilitate viral transmission, particularly within high-risk groups.

Both the University of Arizona and Arizona State University are reporting aggregate cases identified on campus. So far, the University of Arizona reports 1148 cases since July 31st. This is more than twice last week's tally of 480 cases. ASU reports 1385 cases since August first which is higher than the 957 cases reported last week. However, without more cogent temporal reporting (e.g., trends), it is difficult to interpret these numbers at face value. Given that both universities continue to report increasing case counts it is difficult to reconcile these reports with the mixed results in the state's data described below.

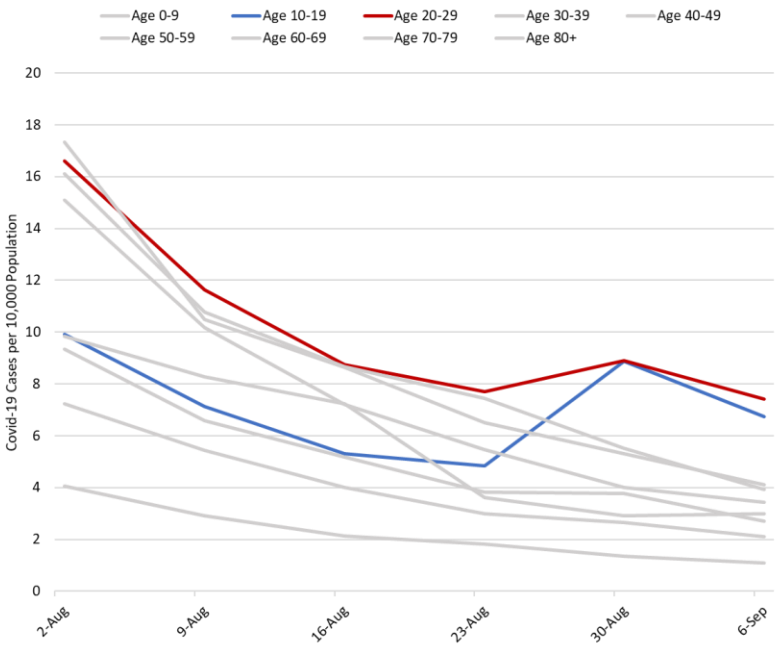

Figure 7. Population-Normed Covid-19 Cases per 10,000 population by Age Group in Arizona July 27 – September 6 (best viewed in color).

After increasing last week, Covid-19 cases among those 0 – 19 years and 20 – 29 years deflected downward this past week (Figure 7) while all other age groups continued to experience declines. The deflection was more pronounced in Maricopa County than Pima County presumably because ASU resumed a bit before the UA (Figure 8)

While this most recent increase is concentrated among those 10 – 29 years, spill-over into the larger community remains a potential concern.

It should also be noted that Universities are conducting surveillance and outbreak testing. Therefore, some increase was expected; however, if increases are sustained over time, then uncontrolled viral transmission will be substantiated.

It should also be noted that actual case counts among university students are considerably higher than shown because of the large age range (10 – 29 years of age) and the fact that not all 18 -24 year olds are enrolled.

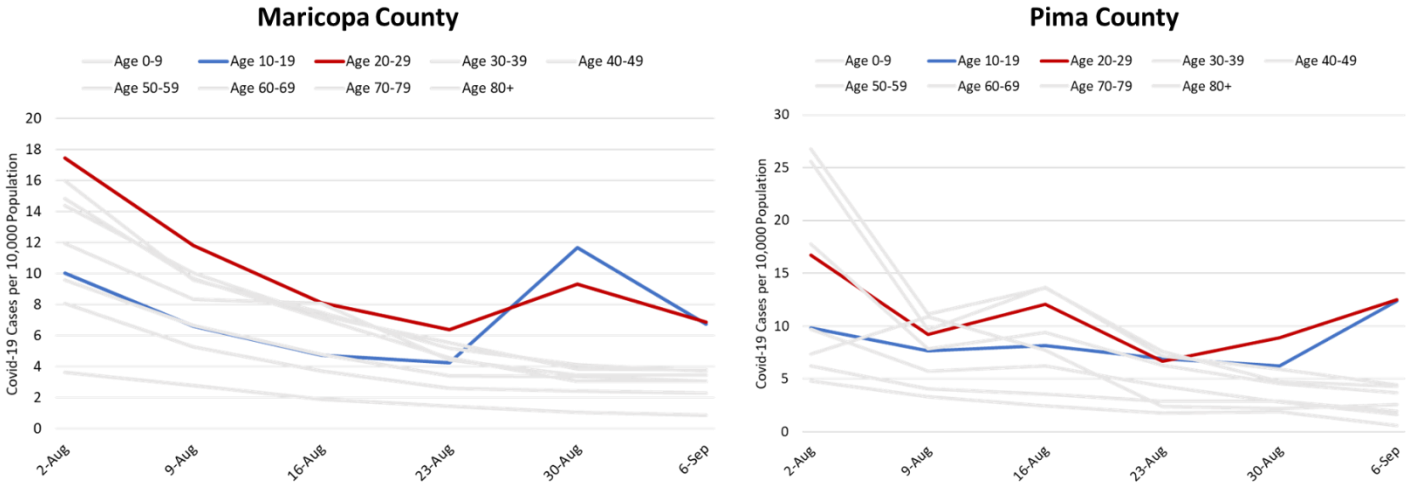

Figure 8. Population-Normed Covid-19 Cases per 10,000 population by Age Group Jul 27 – September 6 in Maricopa and Pima Counties (best viewed in color).

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Summary:

- Arizona is transitioning to a new phase of the outbreak where viral transmission is declining in the working-age and older adult populations but increasing among adolescents and young adults. This change is most likely attributable to re-opening of university campuses.
    - 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.
    - While the risk of severe disease in young adults is low, that is not the same as no risk. As case counts increase, some young adults will invariably require hospitalization and it is not out-of-the question that a small number of deaths could result.
    - Reporting lag for PCR results has improved such that ≥90% of results are returned within 48 hours; however, the rapid rise in saliva testing on university campuses presents new challenges in data reporting and interpretation.
- Outside of young adults, levels of community-driven viral transmission are on par with those observed in mid-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.
    - As additional activities (e.g., schools and businesses) resume, they will bring more people into closer contact and will facilitate additional viral transmission. Therefore, continued adherence with mask wearing, physical distancing, hand hygiene, and surface decontamination will be needed to mitigate these risks.
- 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 is available for the foreseeable future.
    - 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 waiting elective procedures.
- Current Covid-19 test capacity appears adequate as evidenced by quick turn-around for PCR results and a PCR test positive percentage of 4% which is within the recommended 3 – 5% threshold.
    - As more Covid-19 testing transitions to saliva testing, it is unclear how this might impact test positivity trends. A rising test positive percentage should raise the possibility of resurgence.

Next update scheduled for September 18.

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

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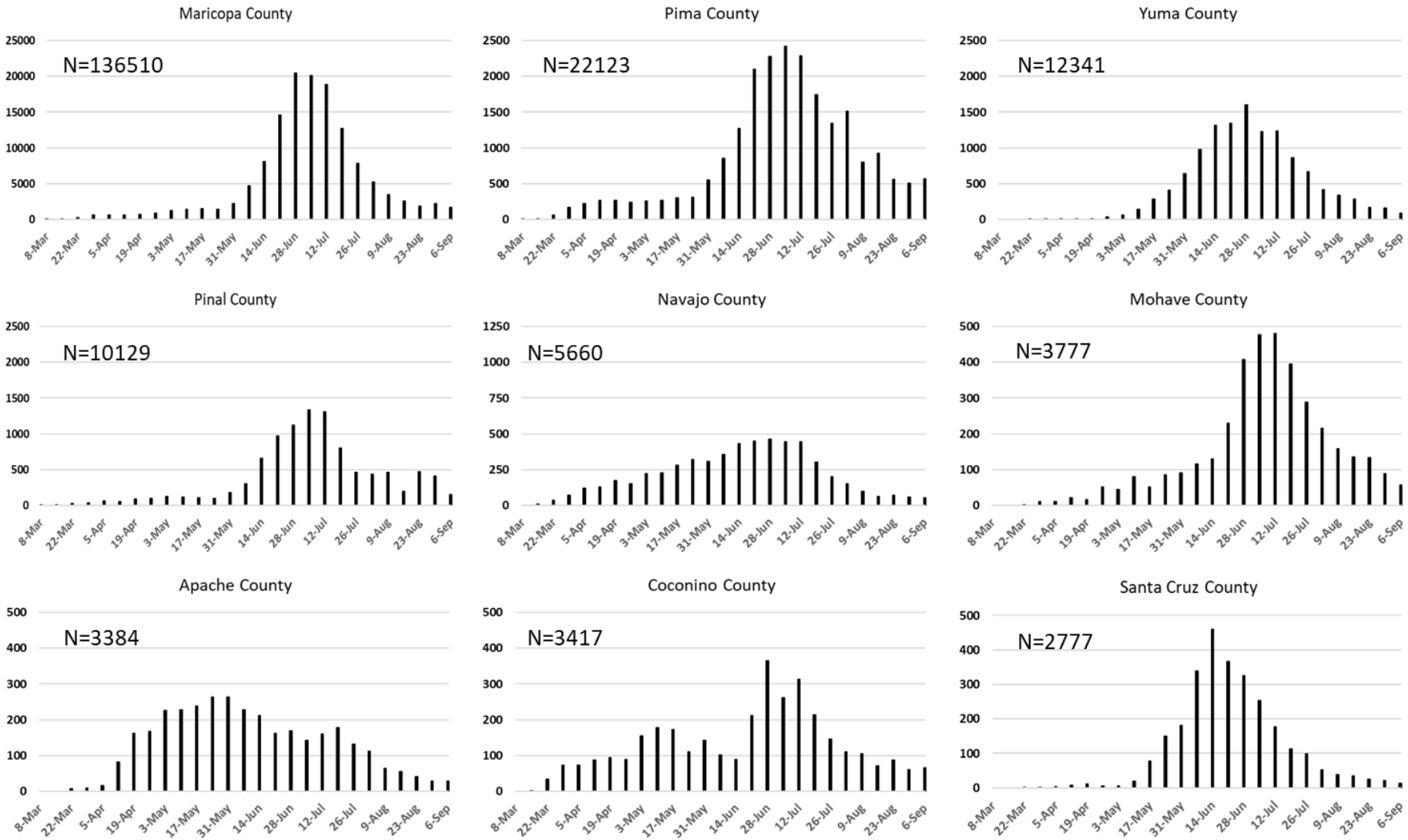
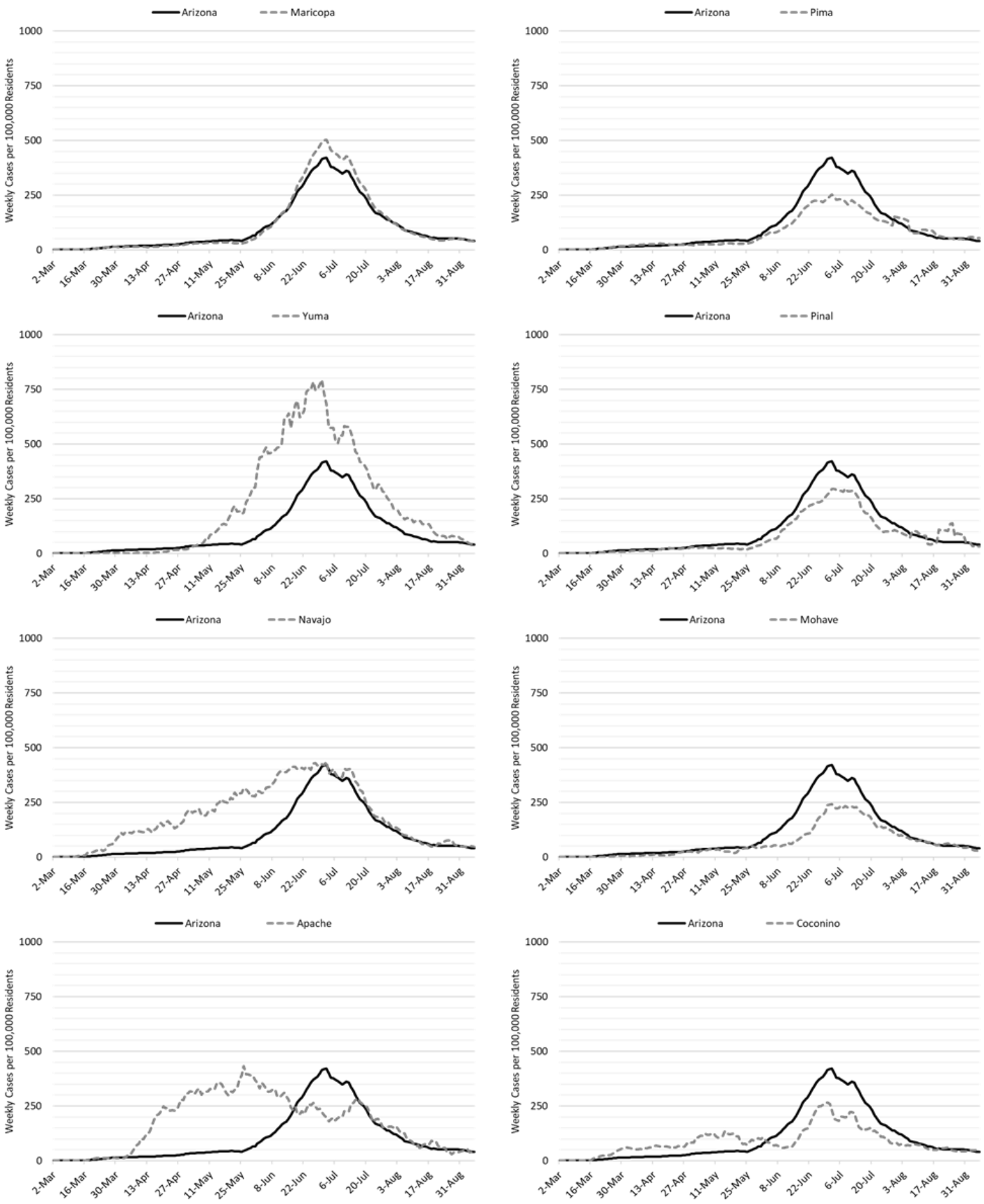


Appendix Figure 1. Weekly Covid-19 Cases by County March 1 – September 6.



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

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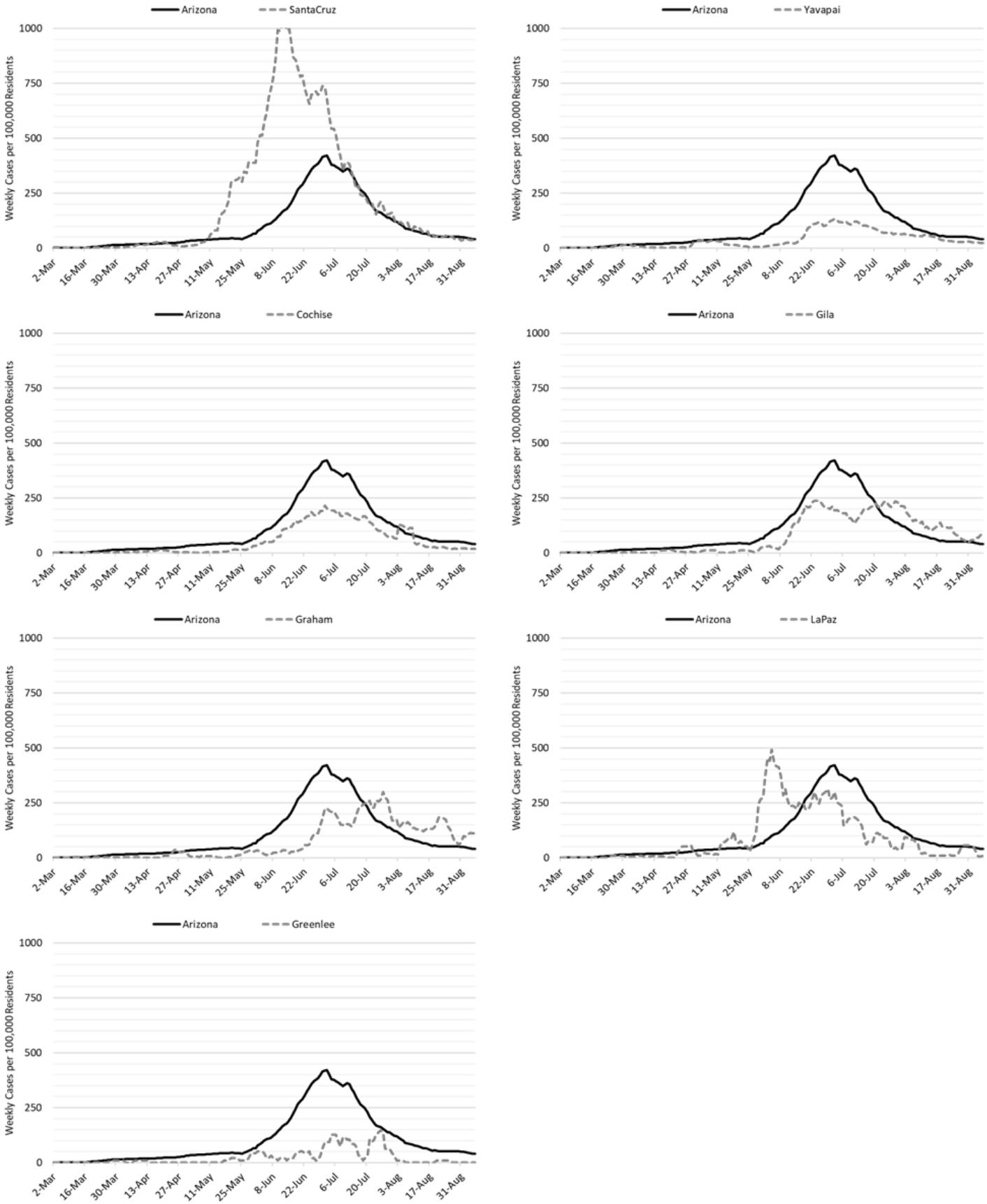

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