Covid-19 Disease Outbreak Outlook
Arizona State and Pima County
Updated October 9, 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 October 4th, 3853 new Covid-19 cases were diagnosed in Arizona (Figure 1). This represents a 4% increase from last week's revised tally of 3709 cases. Because delays in test reporting remain minimal, last week's initial tally of 3592 new cases was only upwardly revised by 117 cases (3%) this week. Note: *Testing counts in Figure 1 reflect PCR testing (nasopharyngeal and saliva) and antigen testing*.

While the gap is narrowing, Arizona's Covid-19 outbreak remains bifurcated. Case counts among those 15 – 24 years of age have decreased for the second straight week, 254 fewer cases than last week, while case counts among all other age groups have been increasing for the past 3 weeks, 398 more cases than last week (Figure 2 following page). Rising case counts in the broader population warrants reappraisal of 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.

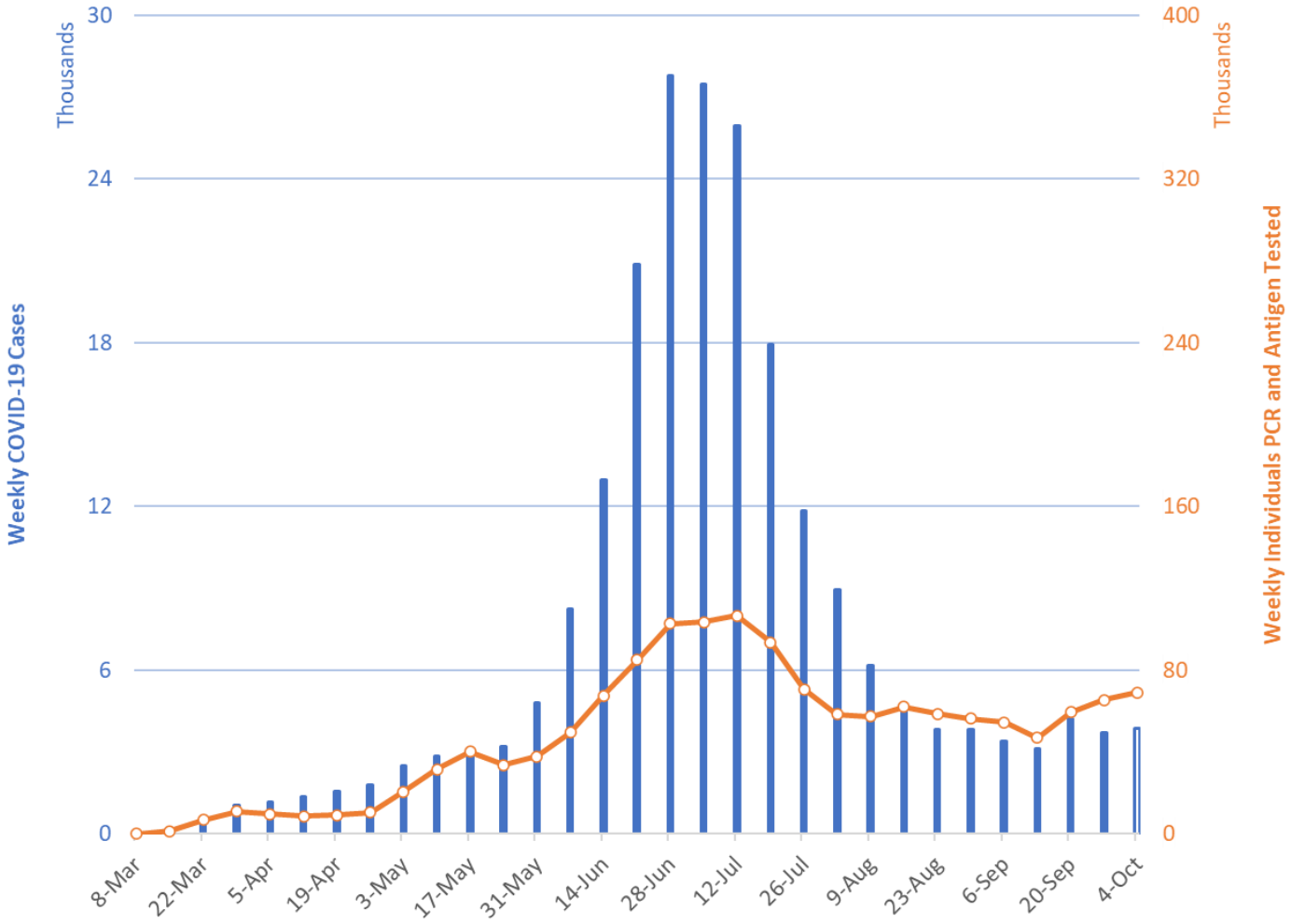

Figure 1. Newly Diagnosed Covid-19 Cases in Arizona and Number of Individuals Undergoing PCR and Antigen Testing March 1 through October 4.

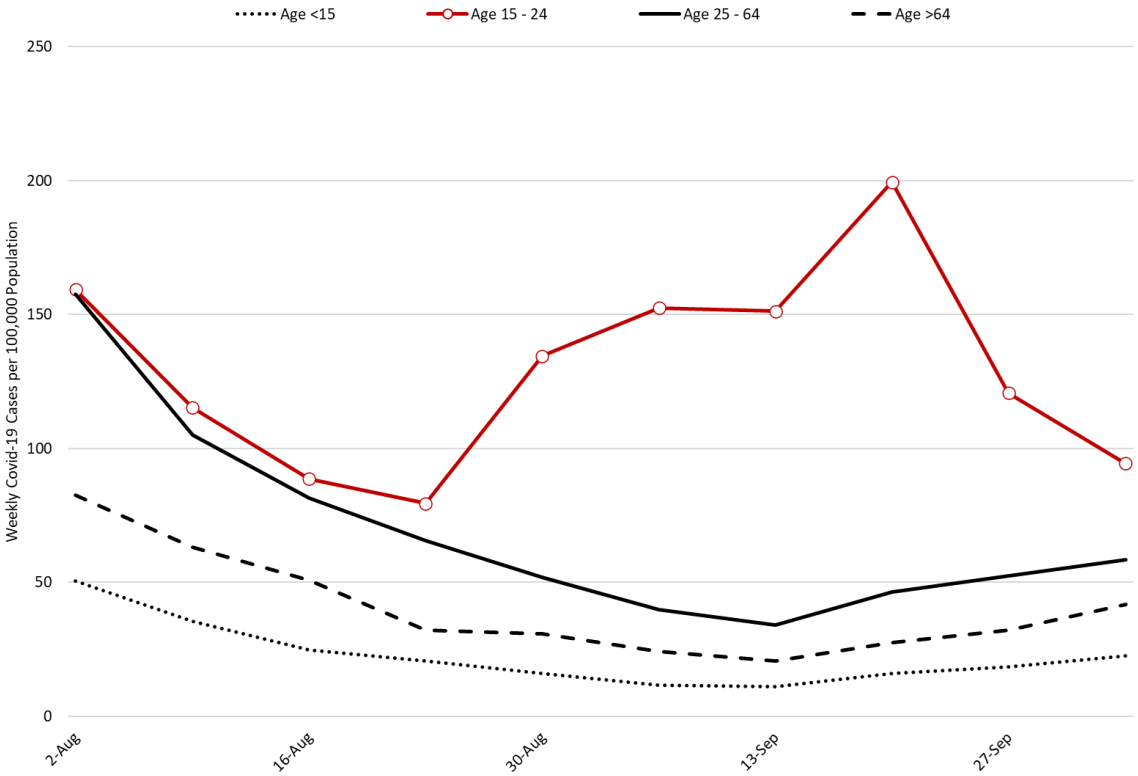

Figure 2. Newly Diagnosed Covid-19 Cases in Arizona by Age July 27 through October 4.

Test positivity among those undergoing PCR testing, including saliva testing, has fluctuated between 5 – 6% for the past 8 weeks (Figure 3) which is near the recommended level of ≤5%.

Antigen testing being conducted by the University of Arizona, some long-term care facilities, and some retail clinics is now 3.1% (Figure 4, left panel).

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 4.1%.

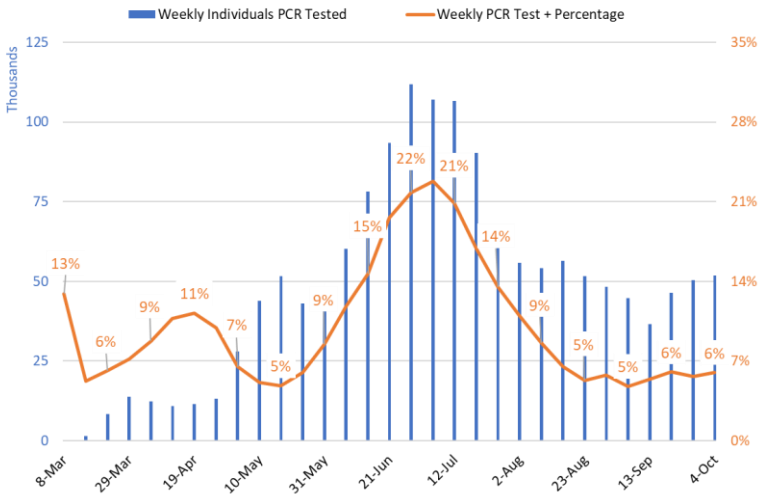

Figure 3. Weekly Number Patients PCR Tested and Percent with Positive Test March 1 – October 4.

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.

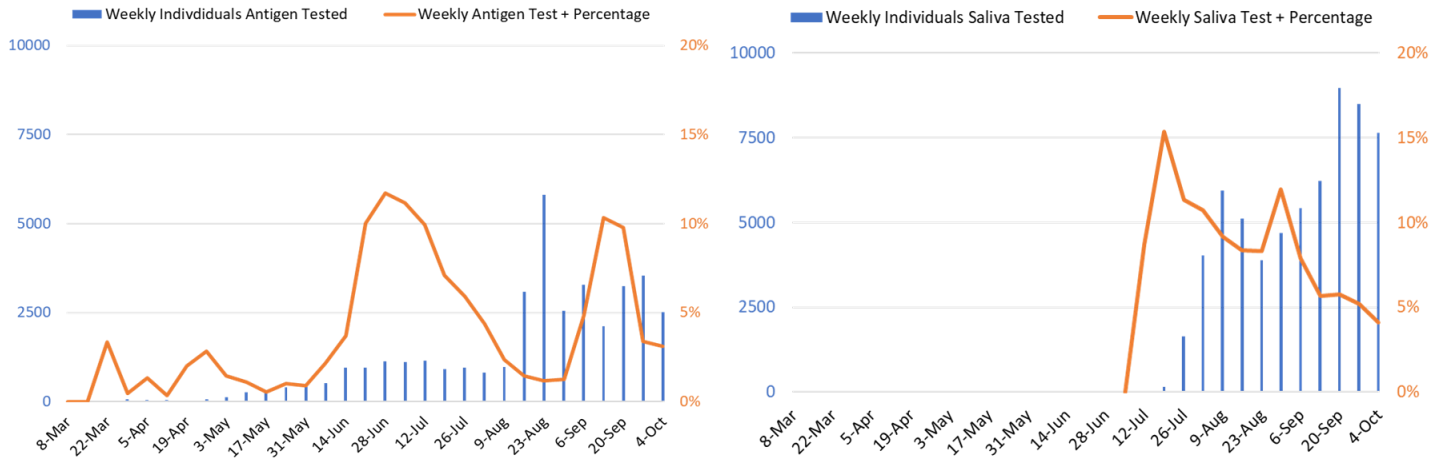

Figure 4. Weekly Number Patients Undergoing Covid-19 Antigen (left) and Saliva (right) Testing and Corresponding Percent Positive Results March 1 – October 4.

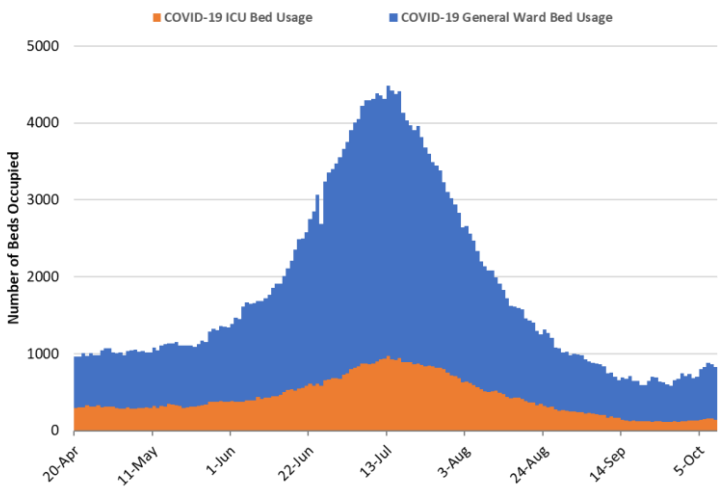

Figure 5. Arizona Daily Covid-19 General Ward and ICU Census April 20 – October 9.

As of October 9th, 830 hospital beds were occupied by patients with suspected or confirmed Covid-19. This number is higher than the 732 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 9th, 685 (8%) of Arizona's 8719 general ward beds were occupied by Covid-19 patients, a 13% increase from last week's 605 occupied beds. However, the total number of hospital beds also unexpectedly increased by 407 beds, 8312 beds to 8719 beds (Figure 6, upper right portion of figure). An additional 1369 (16%) beds remain available for use which is lower than last week's 1376 beds.

The percentage of general ward beds occupied by patients with confirmed or suspected Covid-19 has remained relatively stable while the number of occupied beds has increased. For example, the percentage of general ward beds occupied by patients with Covid-19 was 6.2% at its lowest point on September 13th. On October 9th is had increased to 7.9% (Figure 7 following page).

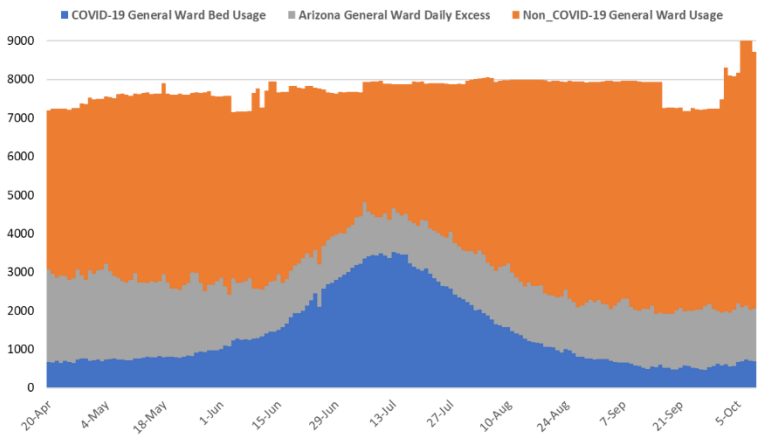

Figure 6. Covid-19, Non-Covid, and Excess General Ward Occupancy April 20 – October 9.

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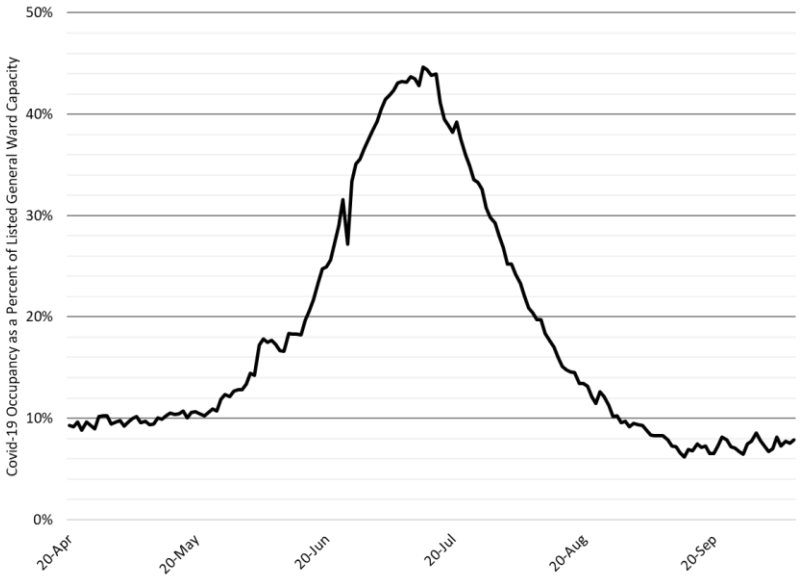

Figure 7. Covid-19 Occupancy as a Percent of Listed General Ward Capacity in Arizona April 20 – October 9.

The recent increase in reported Covid-19 general ward occupancy is mostly attributable to more hospitals reporting occupancy data to ADHS. However, some part of the increase is also due to increasing community transmission among those >24 years of age.

As of October 9th, 145 (9%) of Arizona's 1652 ICU beds were occupied for Covid-19 care, a 14% increase from last week's 127 occupied beds. The total number of ICU beds has not appreciably changed over the same period, 1631 to 1652 beds. An additional 344 359 (21%) ICU beds remain available which is smaller than last week's 359 beds.

Arizona will not exceed its listed capacity of non-surge general ward or ICU beds unless improvements reverse (Figure 8).

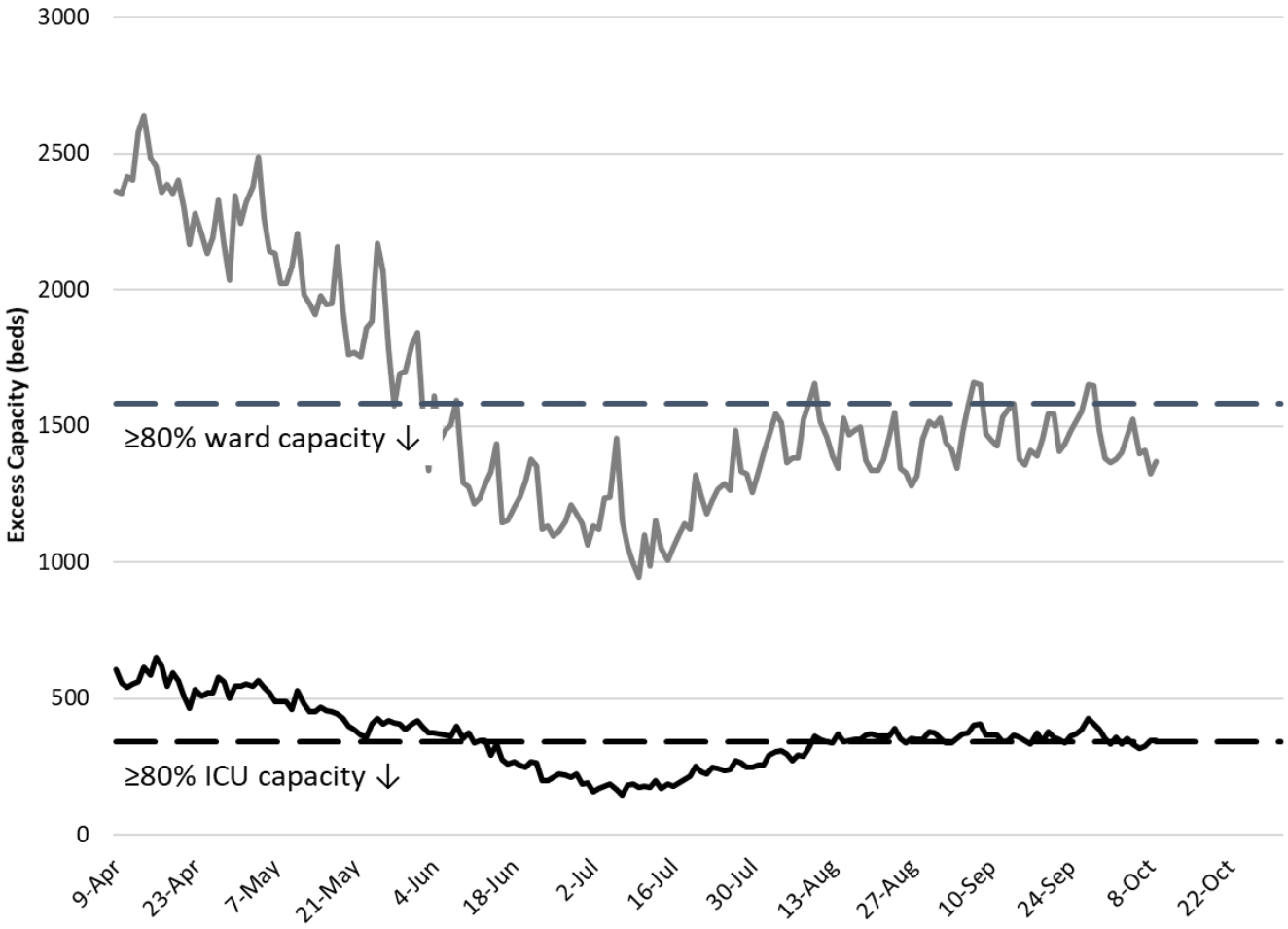

Figure 8. Observed Excess Non-Surge General Ward and ICU Capacity April 20 – October 9.

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With 609 deaths reported to date, the week ending July 19th remains Arizona's deadliest week (Figure 9). Because new case counts are relatively stable, mortality trends are also expected to be stable or declining for the foreseeable future.

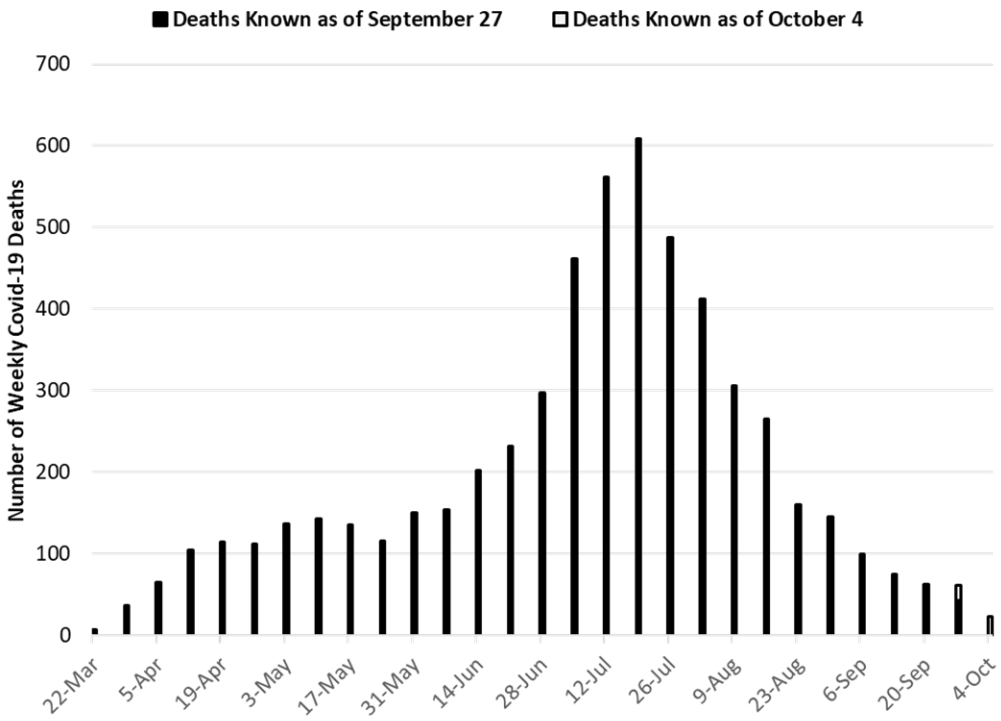

Figure 9. Weekly Known Arizona Covid-19 Deaths March 1 – October 4.

Pima County Outlook

For the week ending October 4th, 517 Pima County residents were diagnosed with Covid-19 (Figure 9). This represents a 12% reduction from the 585 confirmed cases last week. This reduction is attributable to fewer cases being diagnosed among University of Arizona students. Some uncertainty remains whether this improvement can be sustained in light of the lifted shelter-in-place order and plans to increase in-person activities in the coming weeks.

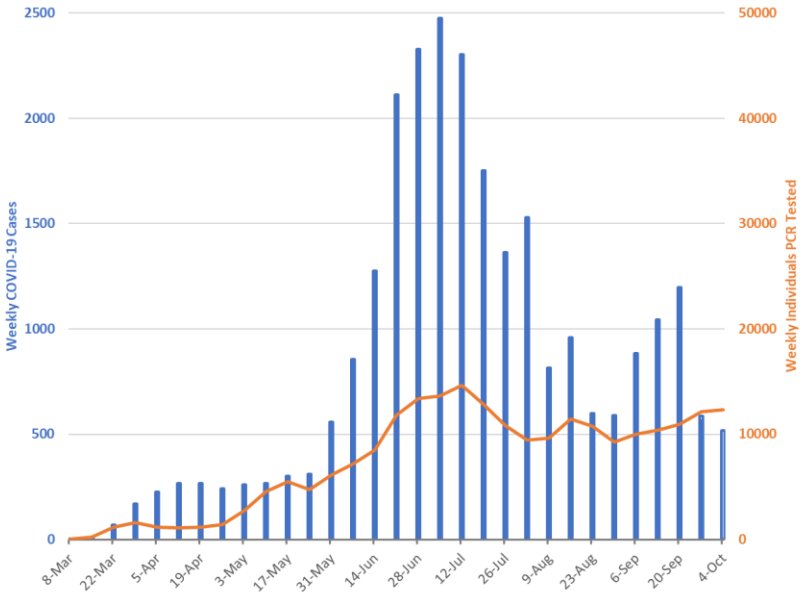

Figure 10. Covid-19 Cases and Number of Individuals PCR and Antigen Tested in Pima County through October 4.

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University Outlook

Both the University of Arizona and Arizona State University report aggregate cases. The University of Arizona has reported 2384 cases since July 31st which is only somewhat higher than the 2342 identified this time last week. This decline is illustrated in Figure 11.

ASU has reported 1922 cases since August 1st which is also somewhat higher than the 1852 cases reported this time last week. The impact of both universities on county-specific aggregate data are shown in Figure 12).

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.

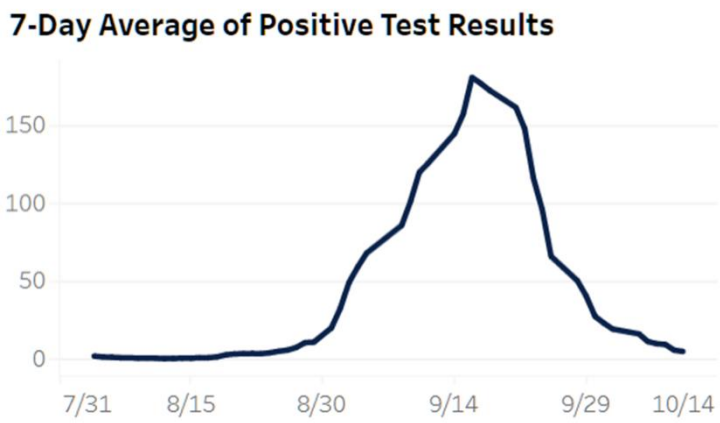

Figure 11. 7-Day Average of Covid-19 Cases Identified by University of Arizona through October 9 as Reported on the UA Dashboard.

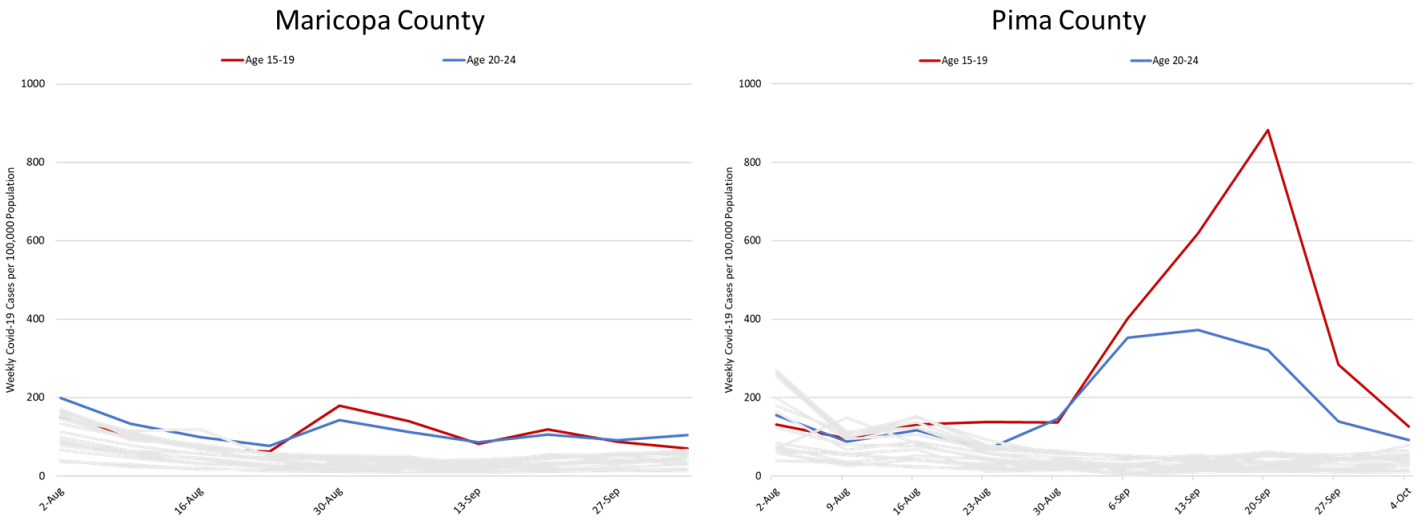

Figure 12. Population-Normed Covid-19 Cases per 10,000 population by Age Group Jul 27 – October 4 in Maricopa and Pima Counties (best viewed in color).

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IMPORTANT CORRECTION

Over the past 2 weeks, I have, against my better judgement, presented data from the Institute of Health Metrics and Evaluation (IHME) regarding self-reported adherence to face mask wearing. I stopped relying on their data projections some time ago after frustration with multiple revisions and lack of transparency. Well, if they didn't get me again.

Notice the vastly different absolute and relative metrics for Arizona on September 20th, 2020. Figure 13 (screenshot from October 4) has an absolute value of 45% and Arizona's relative position is equal to the US average. Figure 14 (screenshot from October 11), Arizona has an absolute value of 80% and Arizona's relative position is the best-performing state. So, unfortunately, I have no idea how well Arizonans are adhering to face masks and neither does IHME.

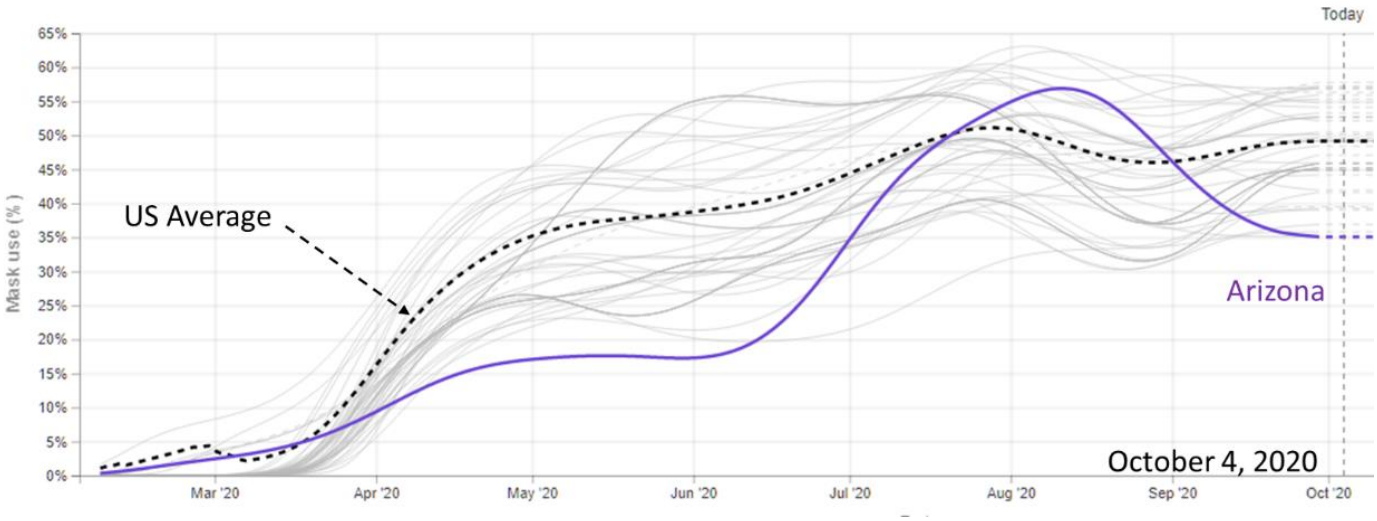

Figure 13. Self-Reported Adherence to Face Mask Wearing by State from the Institute of Health Metrics and Evaluation (Screenshot taken October 4, 2020).

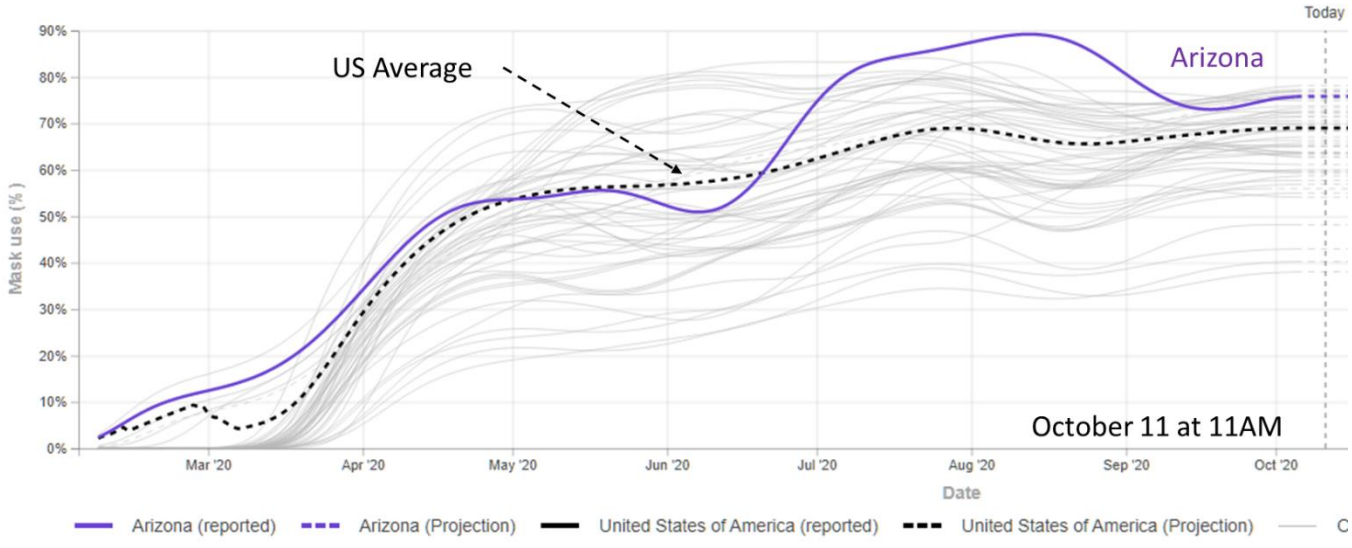

Figure 14. Self-Reported Adherence to Face Mask Wearing by State from the Institute of Health Metrics and Evaluation (Screenshot taken October 11, 2020).

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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 increased with the re-opening of our 3 major universities in mid-August and have since declined.
    - Viral transmission among those <15 years and >24 years, while considerably lower than among those 15 – 24 years of age, has been slowly increasing for the past 2- 3 weeks.
- Overall, levels of community-driven viral transmission are comparable to those observed in mid-to-late May when Arizona re-opened its broader economy.
    - Mask-wearing ordinances will be needed for the foreseeable future to mitigate the spread of Covid-19.
- Covid-related hospital utilization is stable or slowly increasing. Reporting inconsistencies in the total bed capacity have been noted for the past several weeks partially obscuring underlying trends. Adequate capacity remains available for the foreseeable future.
- 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 16.

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

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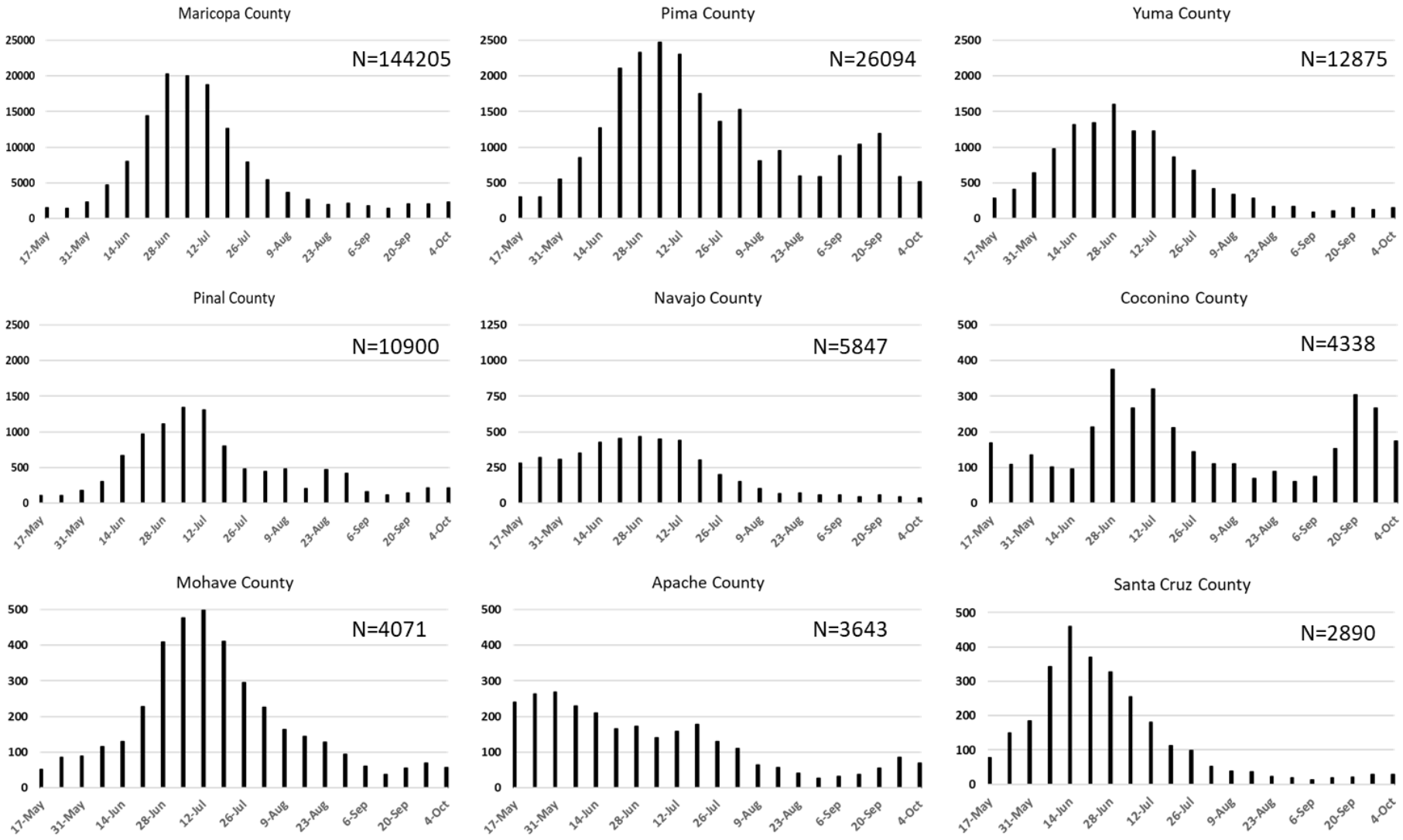

Appendix Figure 1. Weekly Covid-19 Cases by County Ma 11 – October 4.

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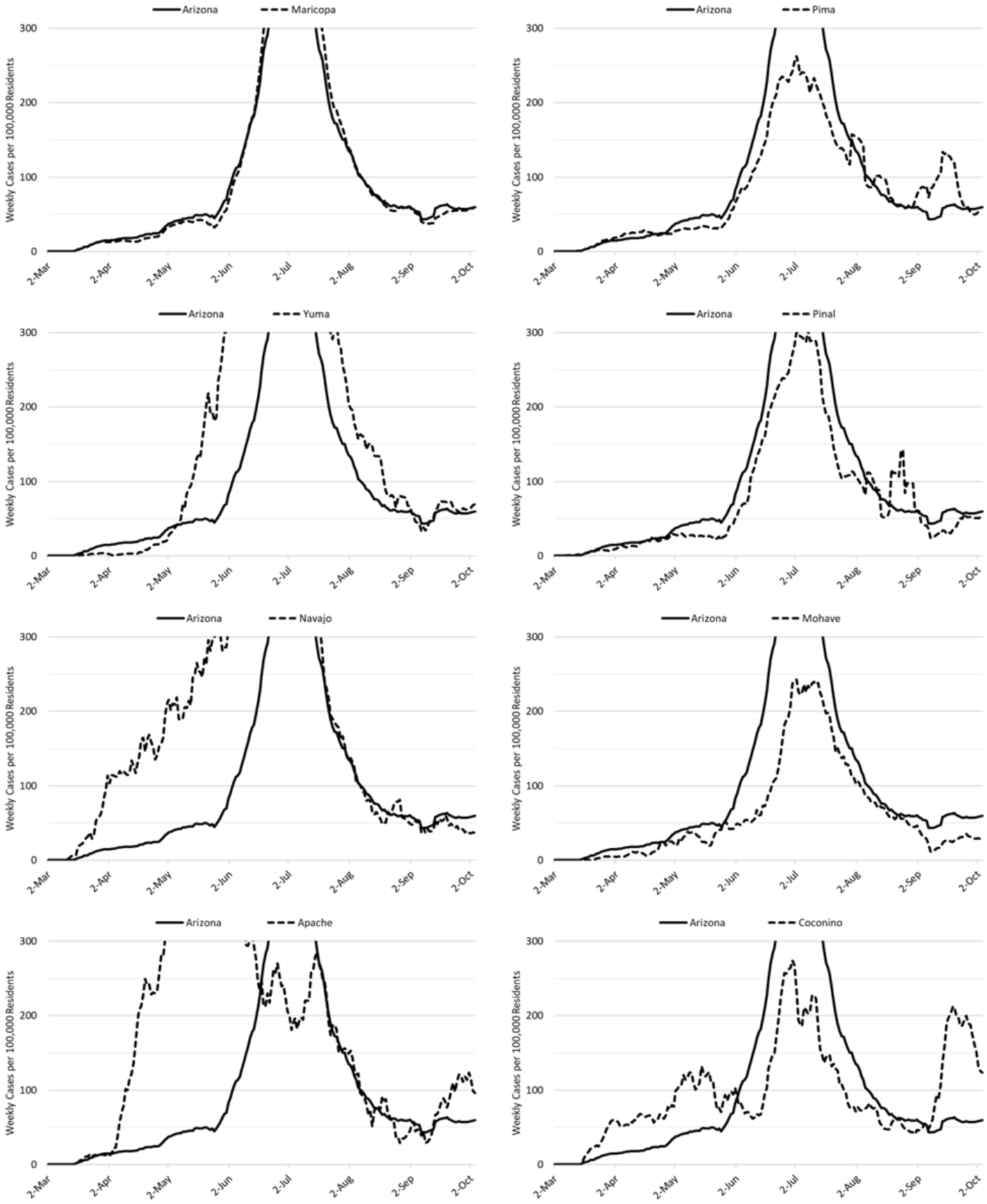

Appendix Figure 2. Weekly Covid-19 Cases per 100,000 Residents by County March 1 – Oct 4.

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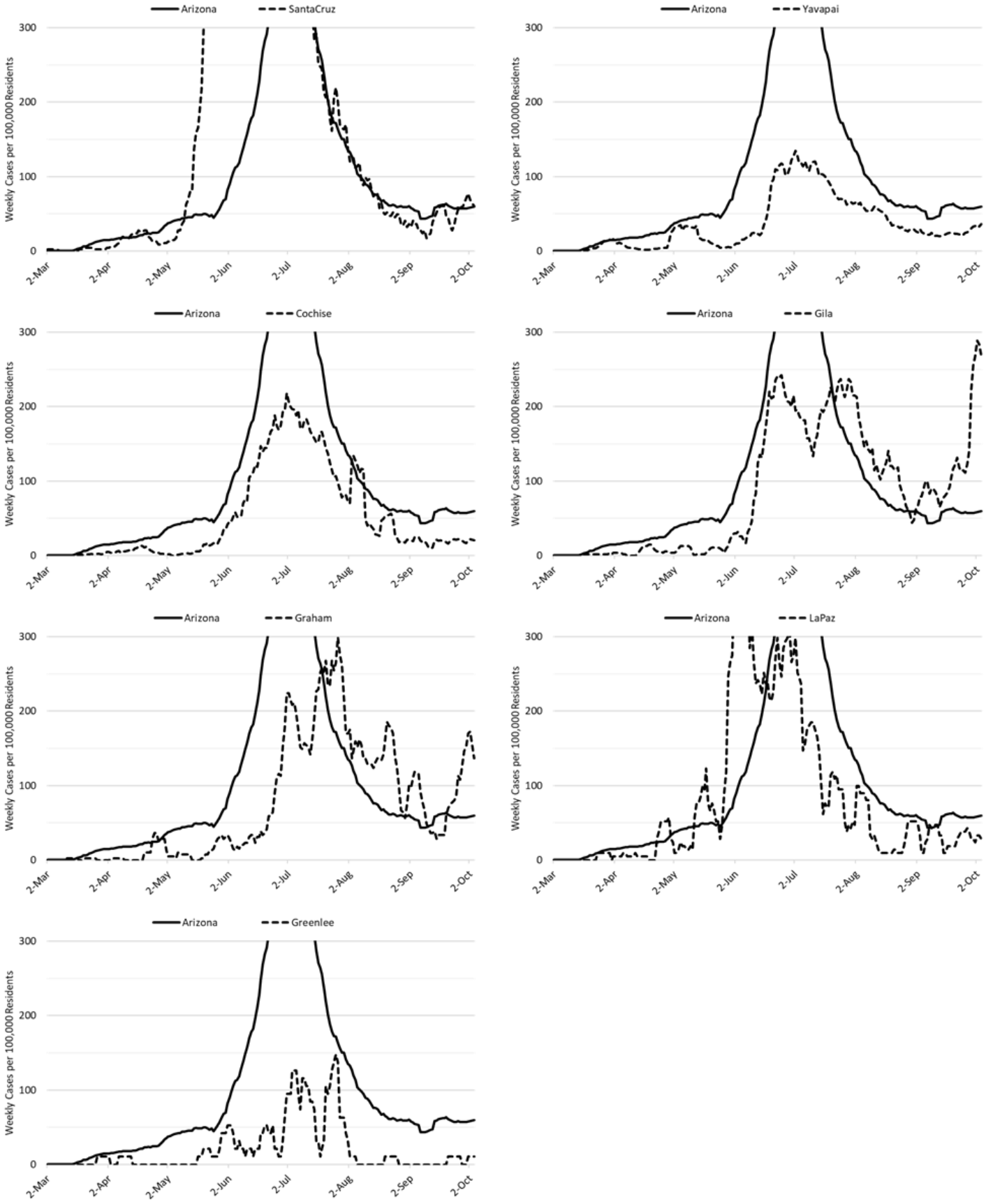

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