

COVID-19 Disease Outbreak Outlook Arizona and Pima County

Update November 12, 2021

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 corresponding recommendations should be considered in conjunction with other corroborating and conflicting data. Past updates can be accessed at <https://publichealth.arizona.edu/news/2021/covid-19-forecast-model>.

For the week ending November 7th, 23864 Arizonans were diagnosed with COVID-19, a 30% increase from last week's initial tally of 18296 cases (Figure 1). Cases are currently being diagnosed at a rate of 328 cases per 100K residents per week; this rate is increasing by 60 cases per 100K residents per week. Rates are highest among those 15 – 24 years and are the lowest among those 65+ years, 383 versus 217 cases per 100K residents per week, respectively (Figure 2a following page).

Arizona continues to experience a persistently high number of cases, hospitalizations, and deaths. With [waning vaccine efficacy](#) and a [potentially short duration of acquired immunity](#), [herd immunity is not achievable](#). As winter approaches, [more previously vaccinated and previously infected individuals will become susceptible](#). While these individuals will [remain protected from severe outcomes](#), they will contribute to community transmission. Unvaccinated Arizonans will not be able to avoid infection by “free riding” on high levels of community immunity. The [decision to remain unvaccinated carries a much greater risk](#) than getting vaccinated does. Hopefully, Merck's new antiviral [molnupiravir](#) will be available soon as it was recently [approved by the UK](#).

Arizona's new case ranking has moved up 8 spots to 8th. The nation's leaders have rearranged themselves: North Dakota (448), Minnesota (446), Alaska (412), Vermont (408), and Colorado (378). According to the [CDC](#), 65% of Arizona adults are fully vaccinated and another 10% have received one dose; however, only 30% of Arizonans 65+ years have received a third dose booster placing us 41st overall. As winter approaches, [waning immunity among those without a booster](#) will place them at risk. The [CDC guidance on boosters](#) now includes guidance for each vaccine. The [ADHS Vaccine Dashboard](#) shows weekly doses delivered fell slightly to 140K doses, many of which are third dose boosters.

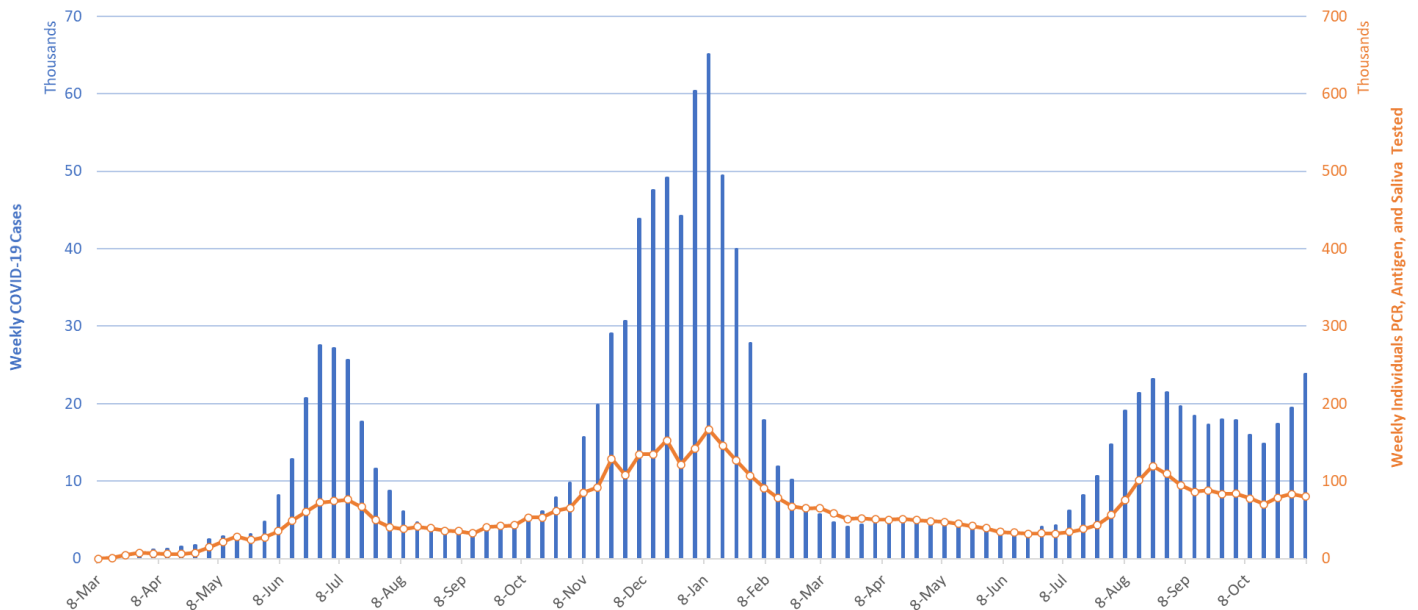


Figure 1. Weekly COVID-19 Cases in Arizona and Number of Individuals Undergoing COVID-19 Diagnostic Testing March 1, 2020 – November 7, 2021.

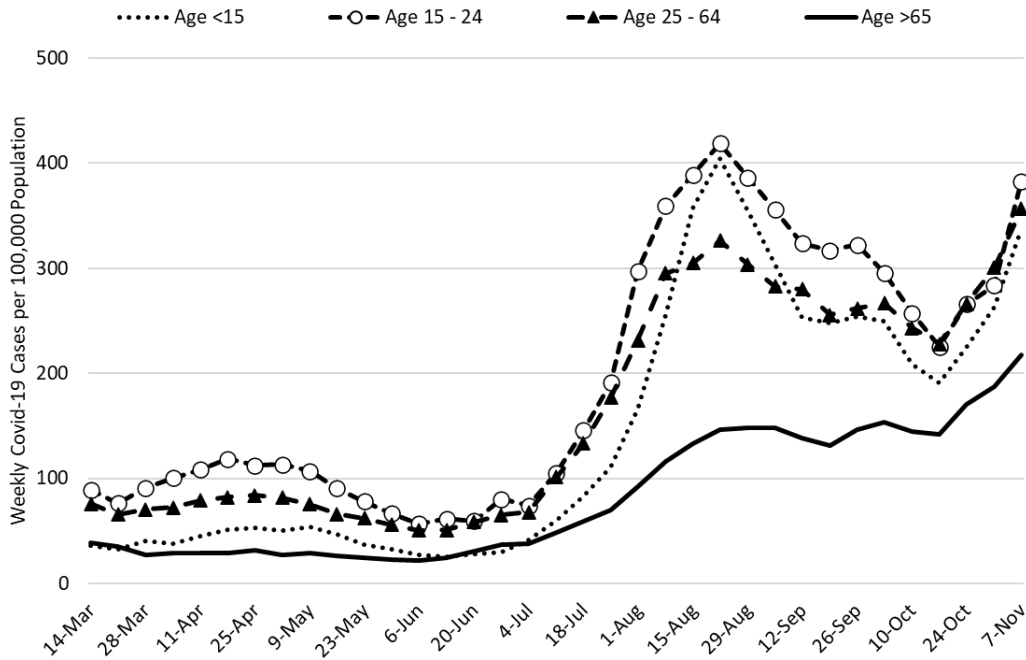


Figure 2a. COVID-19 Cases in Arizona by Age Group March 7 – November 7, 2021.

Figure 2a shows an abrupt increase in transmission among all age groups starting early-mid October, even among those 65+ years who have high levels of vaccination. A similar pattern is evident among school-age children (Figure 2b). Low vaccination uptake, ineffectual or absent mitigation efforts, and waning immunity are ultimately to blame for our circumstances but the cause of this most recent uptick during a relatively stable policy environment is unclear.

The [Arizona Supreme Court unanimously ruled](#) that recent legislation banning schools from requiring mask use was unconstitutional. While preventing a ban is better than allowing one, this ruling simply prevents the legislature from making a bad situation worse. Optimal policy would have been to require, not prohibit, face coverings in all K – 12 settings at the beginning of the school year before child vaccine approval was granted.

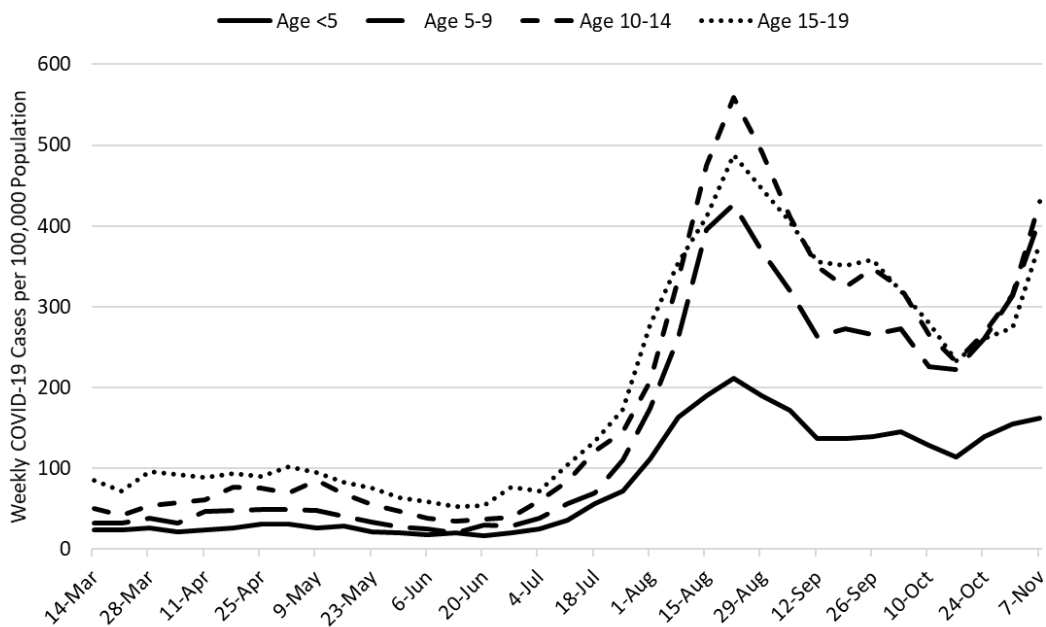


Figure 2b. COVID-19 Cases in Arizona among Children by Age Group March 7 – November 7, 2021.

Test positivity, at 28%, continues to rise (Figure 3). Testing is inadequate for public health practice and many cases are going undiagnosed.

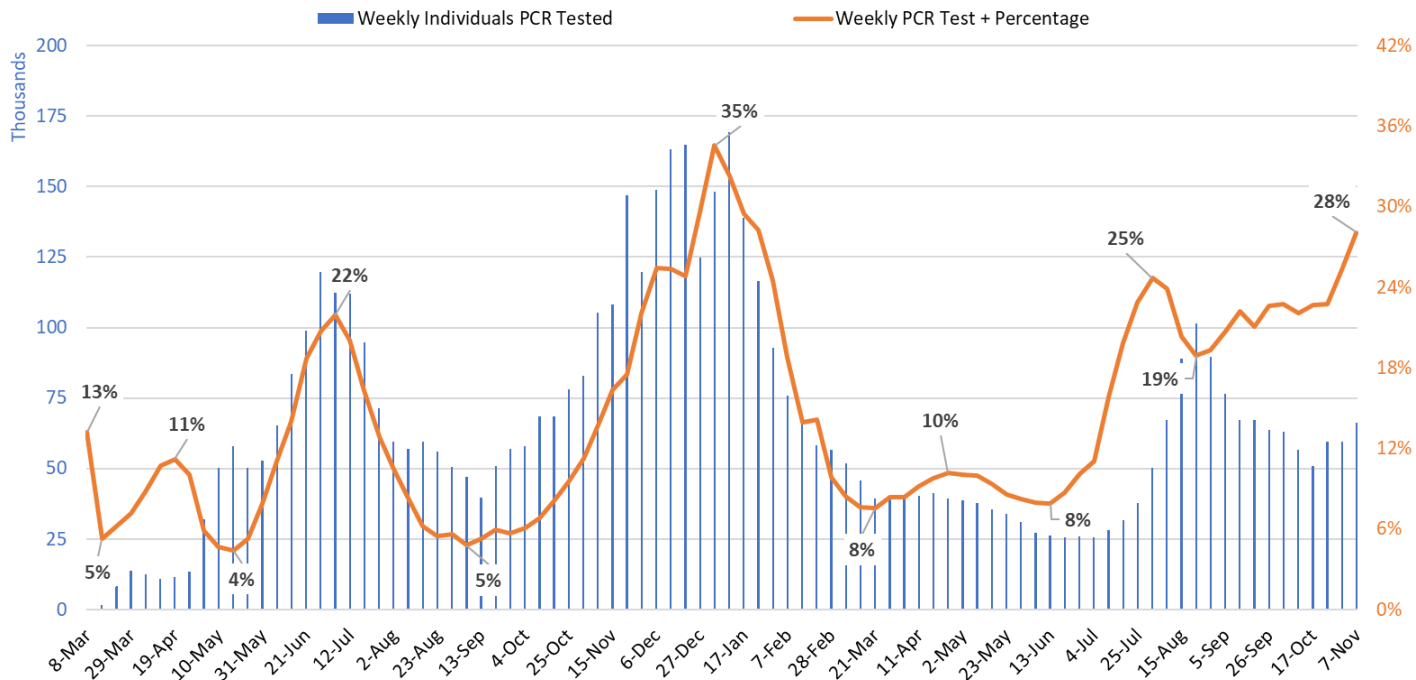


Figure 3. Weekly Number of Patients Undergoing Traditional Nasopharyngeal PCR Testing and Associated Percent Positivity March 1, 2020 – November 7, 2021.

As of November 10th, 2113 (24%) of Arizona’s 8779 general ward beds were occupied by COVID-19 patients, a 16% increase from last week’s 1828 occupied beds (Figure 4 and Figure 5 Panel A). Another 591 (7%) beds remained available for use. The number of available ward beds is lower than last week’s 679 beds. Five-hundred thirty-five (535, 30%) of Arizona’s 1776 ICU beds were occupied by COVID-19 patients, an 18% increase from last week’s 453 occupied beds (Figure 4 and Figure 5 Panel B). An additional 147 (8%) ICU beds remained available for use, similar to last week’s 153 beds.

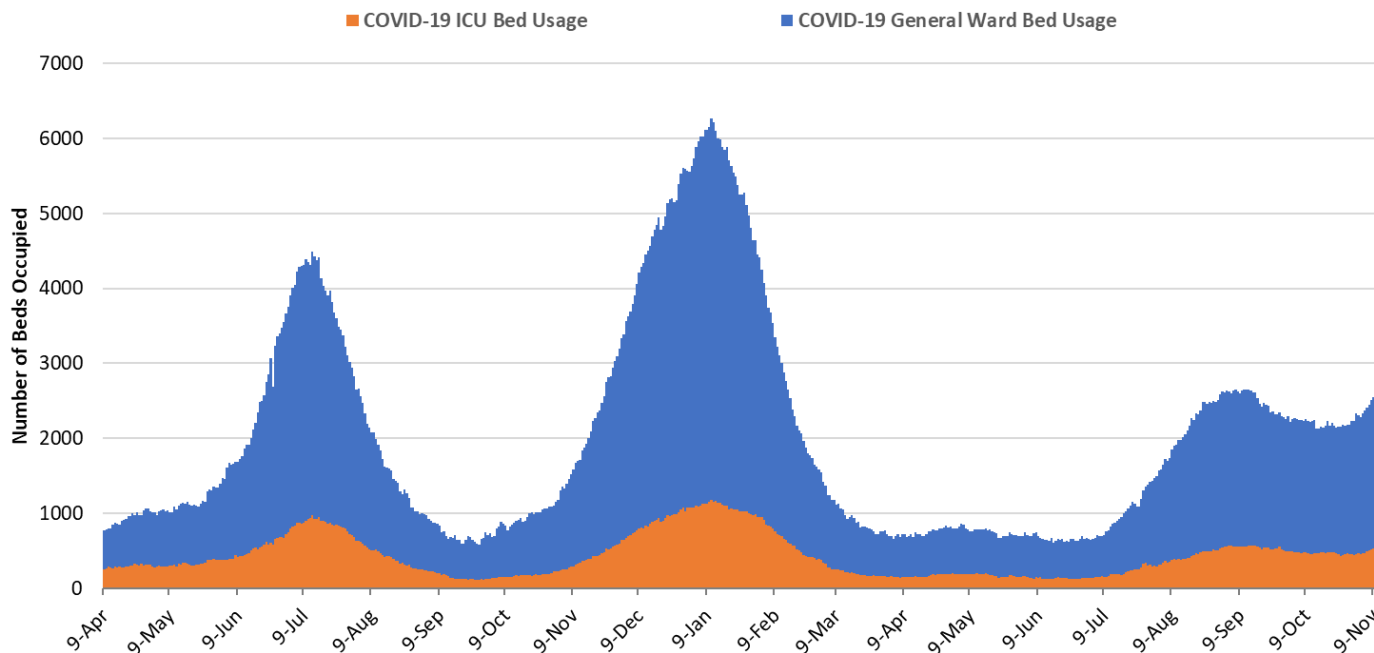


Figure 4. Arizona Daily COVID-19 General Ward and ICU Census April 9, 2020 – November 10, 2021.

Created by Joe K. Gerald, MD, PhD (Associate Professor, Zuckerman College of Public Health, geraldj@email.arizona.edu) with assistance from Patrick Wightman, PhD from the UA Center for Population Health Sciences.

While peak occupancy with this third wave never reached levels seen in the prior two, the base of the wave has the potential to be broader. For example, the summer 2020 and winter 2021 waves saw 57 and 98 days with combined ward and ICU occupancy >2000 patients, respectively. **So far, this current wave has seen 90 days with a combined occupancy >2000 patients with no resolution in sight.** Persistently high COVID-19 occupancy will have important implications through our seasonal peak occupancy in February.

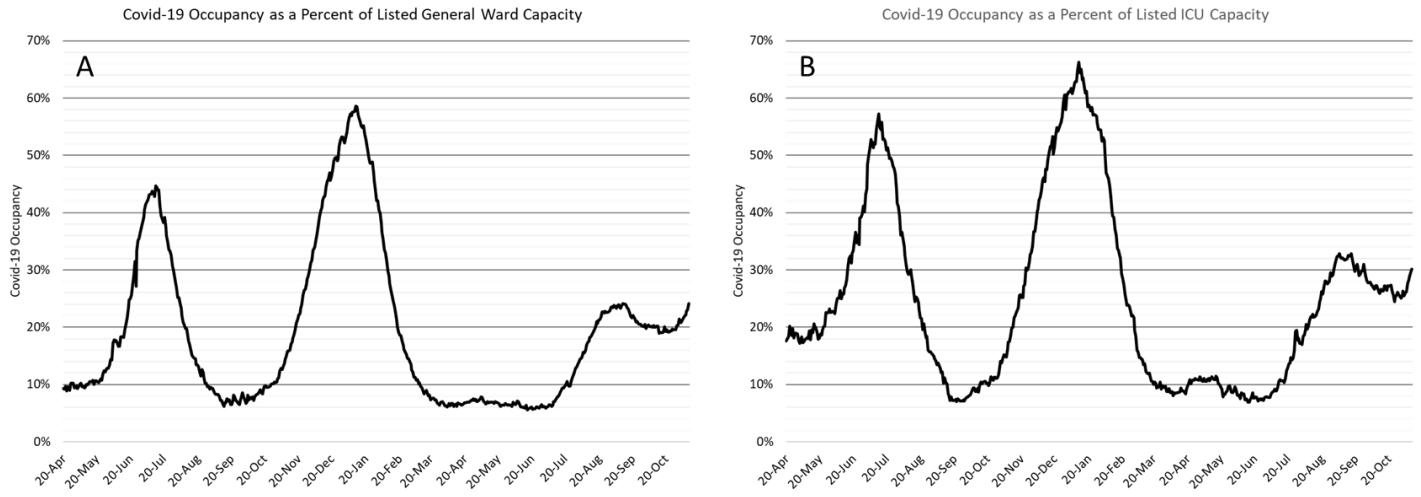


Figure 5. COVID-19 Occupancy as a Percent of Listed General Ward (A, left) and ICU (B, right) Capacity in Arizona April 20, 2020 – November 10, 2021.

Arizona hospital occupancy remains far above seasonal levels. Safety margins, as measured by excess available beds, remain quite low (Figure 6). Hospitals should be prepared for >20% ward occupancy and >25% ICU occupancy for some time to come.

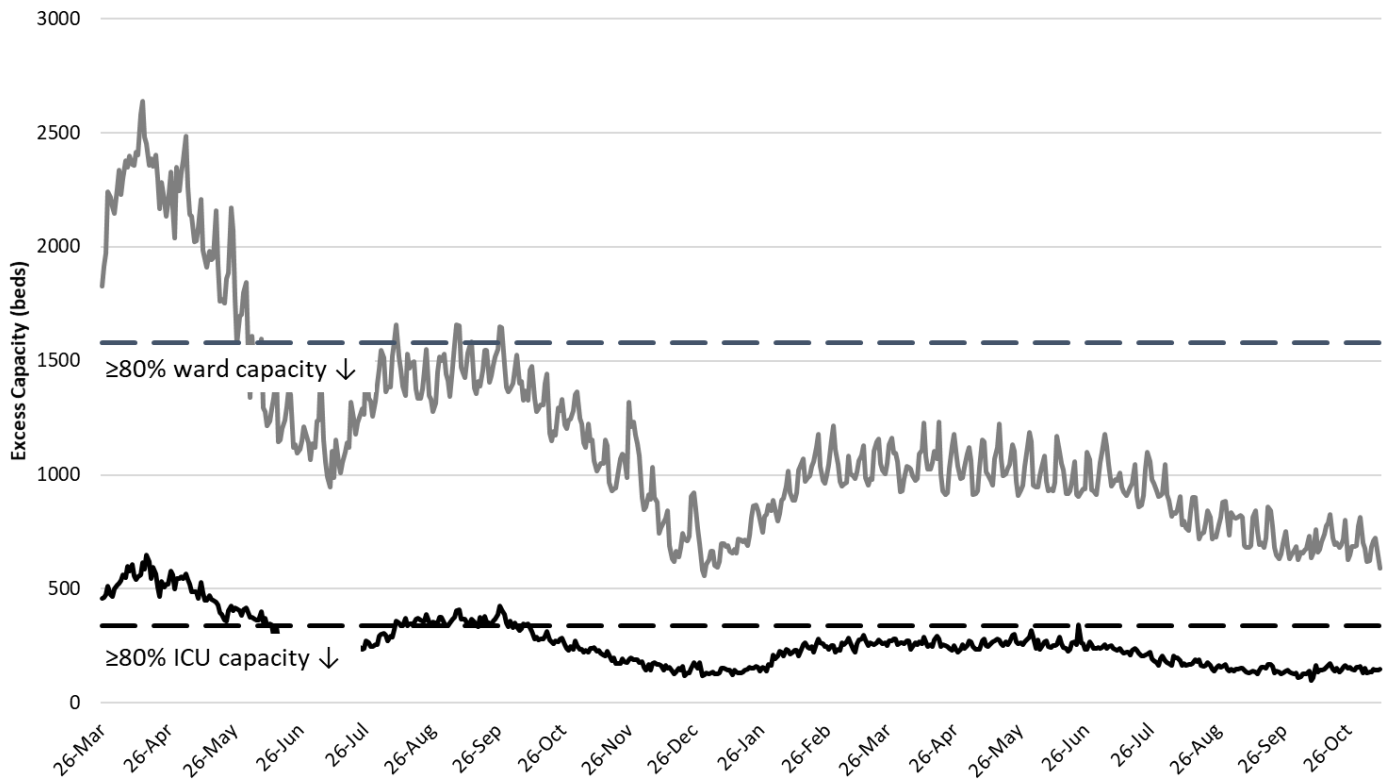


Figure 6. Observed Excess Non-Surge General Ward and ICU Capacity in Arizona March 26, 2020 – Nov 10, 2021.

Arizona has been experiencing >200 COVID-19 deaths per week since August 22nd. The week ending September 5th has now recorded 302 deaths (Figure 7). The weeks ending September 12th and 19th are close behind with 290 and 301 deaths, respectively. So far, 21651 Arizonans have lost their lives to COVID-19 making it Arizona's [leading cause of death](#), the [only state to achieve such a distinction](#).

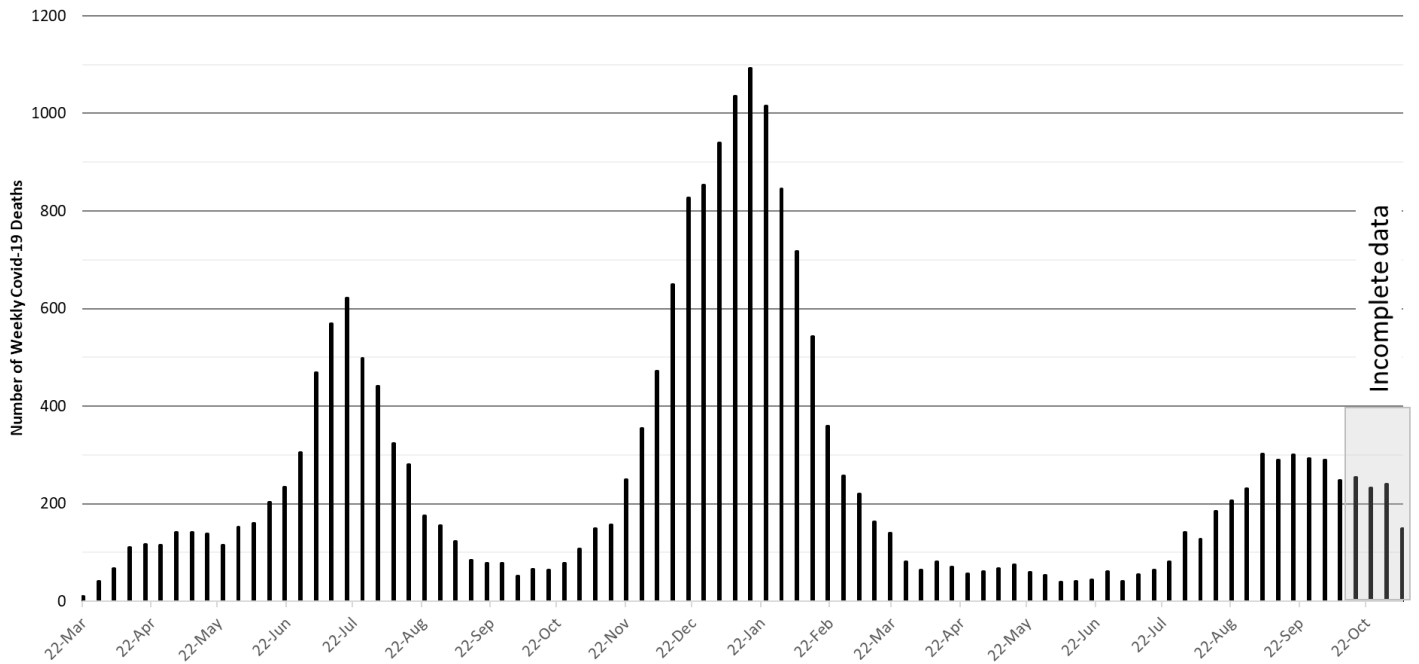


Figure 7. Weekly Arizona COVID-19 Deaths March 16, 2020 – November 7, 2021.

Pima County

For the week ending November 7th, 3273 Pima County residents were diagnosed with COVID-19 a 26% increase from last week's tally (Figure 8). New cases are being diagnosed at a rate of 313 cases per 100K residents per week and this rate is increasing by 54 cases per 100K residents per week. Trends across the various age groups appear in Figure 9.

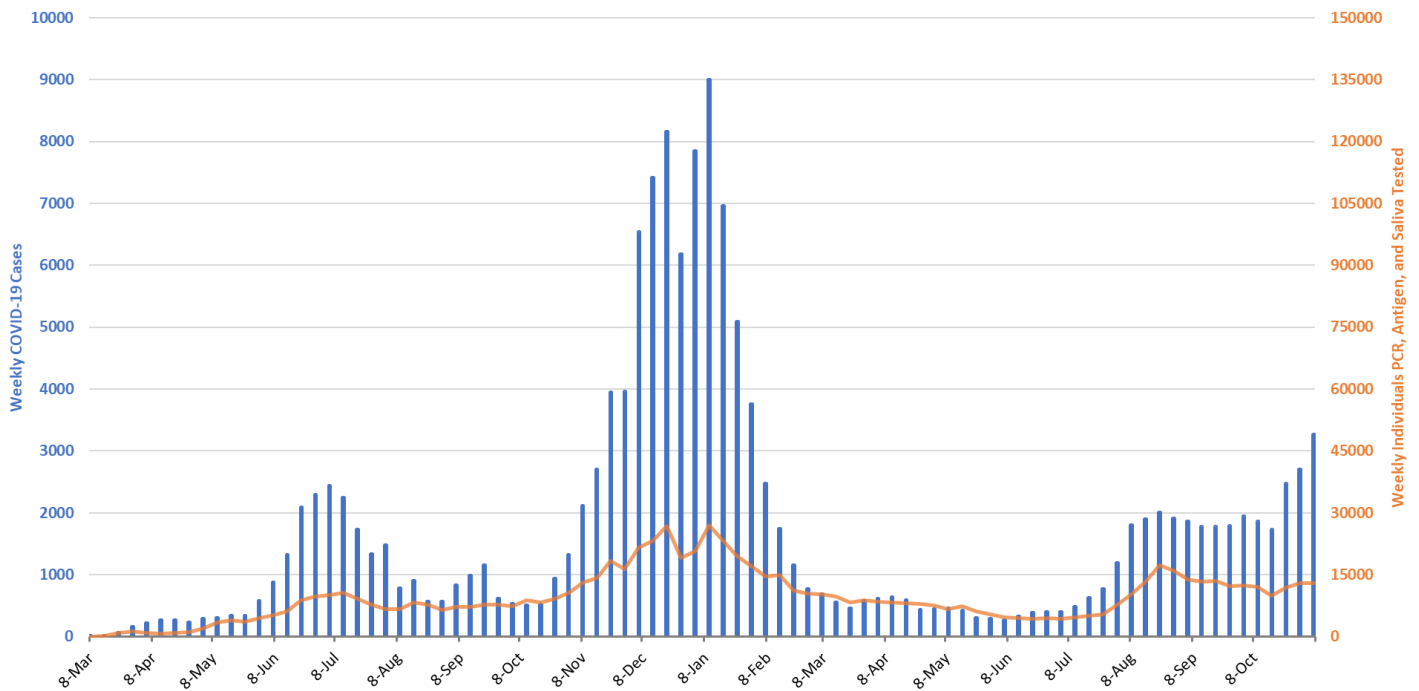


Figure 8. Weekly COVID-19 Cases in Pima County and Number of Individuals Undergoing COVID-19 Diagnostic Testing March 1, 2020 – November 7, 2021.

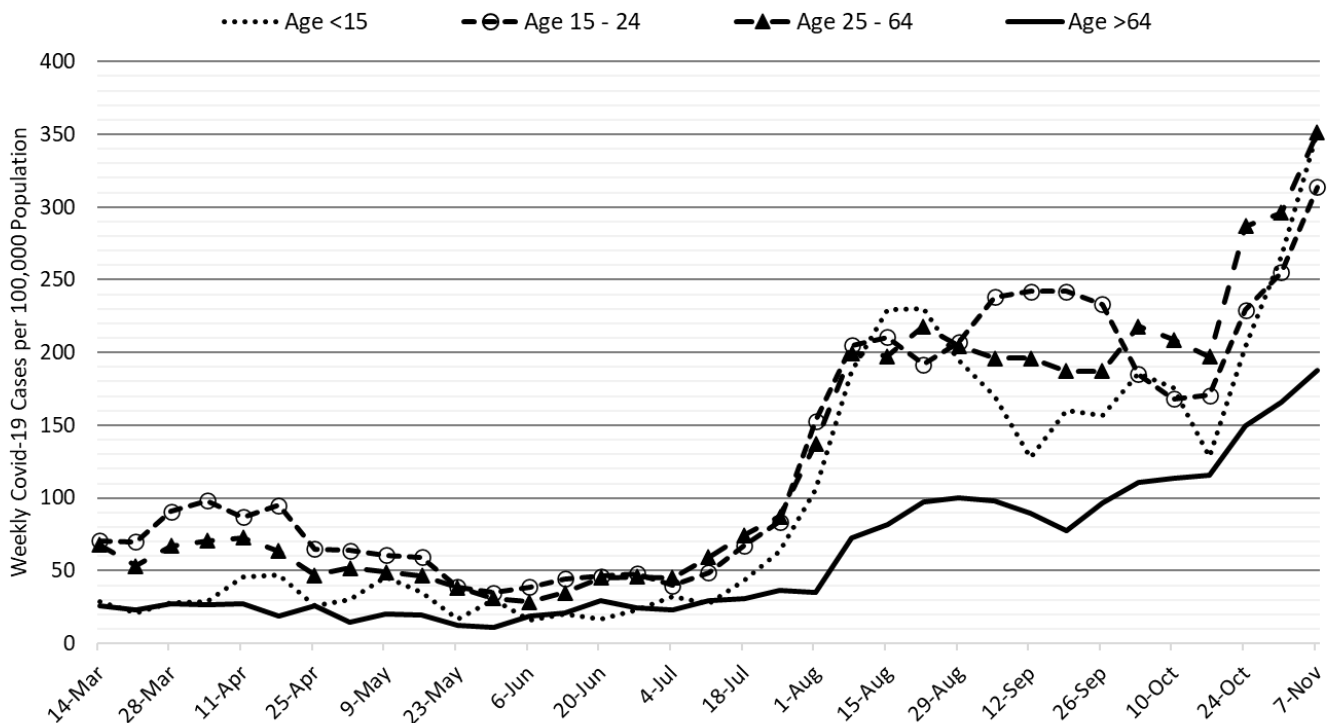


Figure 9. COVID-19 Cases in Pima County by Age Group March 7, 2020 – November 7, 2021.

Summary:

- Arizona continues to experience high levels of community transmission with case rates unexpectedly climbing 62% in the past 3 weeks. Test positivity remains high reminding us that test capacity, accessibility, and/or uptake is inadequate. Increasing case rates among older, highly vaccinated groups serves as a warning that major behavioral shifts and/or waning immunity could result in future increases in not only cases but also hospitalizations.
 - **As of November 7th, new cases were being diagnosed at a rate of 328 cases per 100K residents per week. The rate was increasing by 54 cases per 100K residents per week.** For most counties, current rates exceed those observed at the height of the summer 2020 wave.
 - Waning vaccine efficacy and a short duration of acquired immunity means the unvaccinated cannot “free ride” on high levels of community immunity. **At this time vaccine mandates for adults are warranted for their protection as well as the community’s.** Persistently high levels of community transmission, and more importantly hospitalizations, are possible for an extended time until the supply of unvaccinated, previously uninfected adults is exhausted. <https://www.science.org/doi/10.1126/science.abm0620>
 - **Waning vaccine immunity also makes it imperative that those who were previously vaccinated obtain a third shot booster, particularly those 50+ years of age.** While vaccination provides greater durability of protection for severe illness than mild reinfection, a third dose booster provides important incremental benefits to individuals, families, and communities. <https://jamanetwork.com/journals/jama/fullarticle/2786040>
 - **Risk factors for breakthrough hospitalization and death were recently elucidated in the British Medical Journal:** Down’s syndrome, kidney transplantation, sickle cell disease, nursing home residents, chemotherapy, recent bone marrow or solid organ transplantation (ever), HIV/AIDS, dementia, Parkinson’s disease, neurological conditions, and liver cirrhosis. <https://www.bmj.com/content/374/bmj.n2244>
- Vaccination remains the most important public health priority to reduce transmission and severe illness; however, **mask mandates, restrictions on indoor gatherings, and targeted business mitigations are needed to reduce/control transmission in the short-run with the primary goal being to avoid overwhelming our critical care facilities.**
 - The FDA/CDC now recommends booster shots for all 3 vaccine brands; they have also broadened the language for booster eligibility <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/booster-shot.html>
 - For those residing in unvaccinated households, considerable benefit accrues if any one member becomes vaccinated. So, there is something you can do (get vaccinated) even if others remain hesitant. <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2785141>
- COVID-19 hospital occupancy is holding steady and will likely exceed 20% of all beds in the general ward and 25% of beds in the ICU for the remainder of the year. Access to care will continue to be restricted in the face of staff shortages in inpatient and outpatient settings.

- Weekly COVID-19 deaths continue to exceed 200 per week and will once again reach, and likely exceed, 300 per week in the coming weeks. So far, 21651 Arizonans have lost their lives to COVID-19.
 - Check out the AzPHA’s COVID-19 Mortality in Arizona report showing that COVID-19 was the leading cause of death in Arizona. <https://azpha.org/2021/10/20/new-azpha-report-covid-19-has-been-the-leading-cause-of-death-during-the-pandemic-in-arizona/>
 - An updated AzPHA analysis shows Arizona was the only state where this happened. This isn’t like the movies where an undisciplined team of misfits (Arizonans) with a poor coaching staff (governor and legislature) will win the championship. In the real world, your team loses, often by a lot! <https://secureservercdn.net/166.62.110.60/p7p.8e2.myftpupload.com/wp-content/uploads/2021/11/AzPHA-Data-Brief-COVID-vs-Heart-Disease-and-Cancer-50-States-nov-3.pdf>
 - Adding insult to injury, a recent study of COVID-19’s impact on life expectancy demonstrated that the only country to see a greater reduction in life expectancy than the US was Russia. Combining the AzPHA analysis with this new data arguably leads to the conclusion that Arizona’s pandemic performance was the worst of the worst! <https://www.bmj.com/content/375/bmj-2021-066768>
 - South Korea, Taiwan, and New Zealand all saw life expectancy increases despite COVID-19 owing to their strong pandemic response (and essentially island hideaways).
 - In another fascinating MMWR study, non-COVID mortality among the unvaccinated was more than twice that of the vaccinated. Will be interesting to see this finding explored further, but in the short-term, just one more reason not to defer to the unvaccinated’s views on health and health policy!! <https://www.cdc.gov/mmwr/volumes/70/wr/mm7043e2.htm>
 - Lastly, in a similar vein, the Lancet recently published an analysis of the HPV vaccine’s impact on cervical cancer in the UK. The short-story... “The HPV immunization programme has successfully almost eliminated cervical cancer in women born since September 1, 1995.” It is success stories like these that make it difficult to accept anti-vaccine sentiments and misinformation. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)02178-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02178-4/fulltext)

Appendix

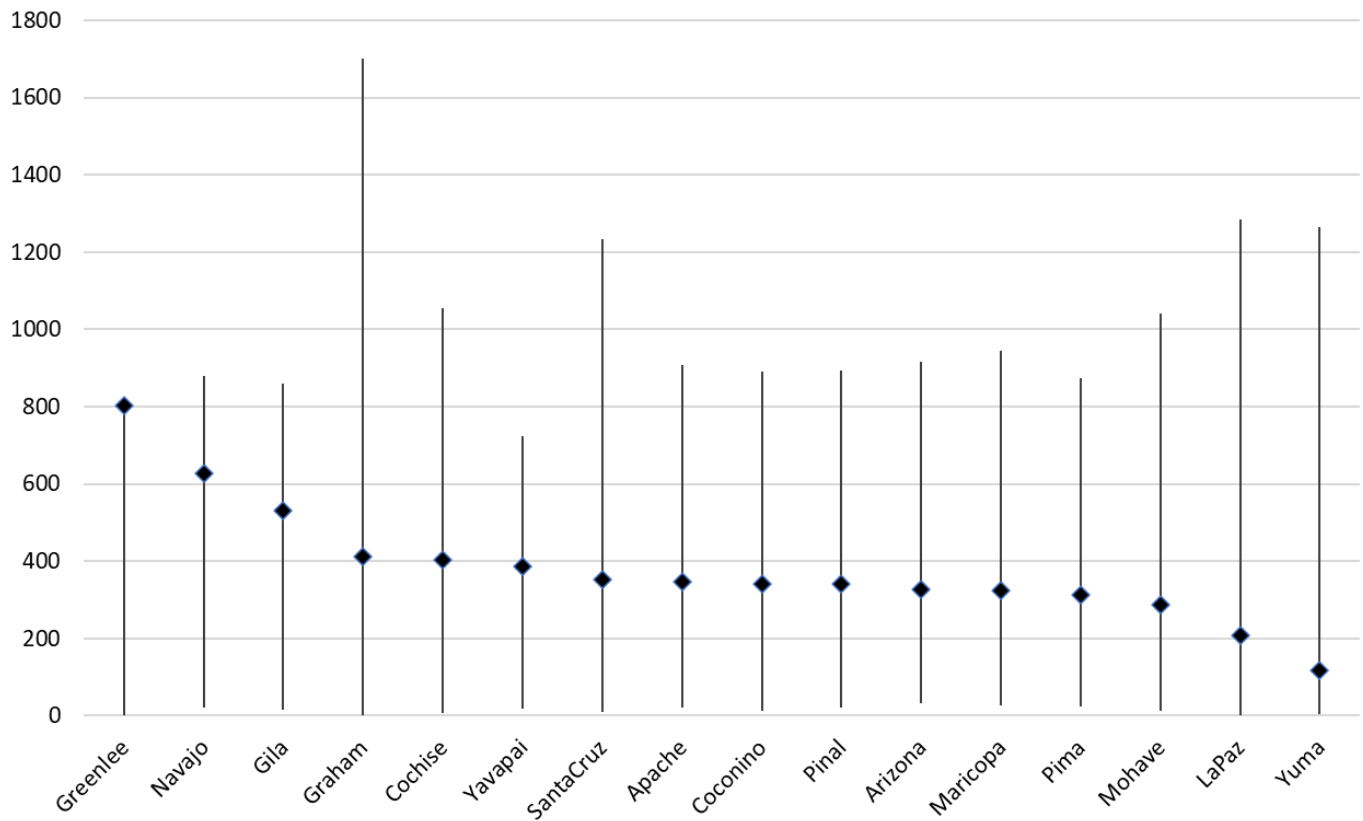


Figure 1A. Minimum, Maximum and Current COVID-19 Cases Rates by County April 1, 2020 - November 7, 2021.

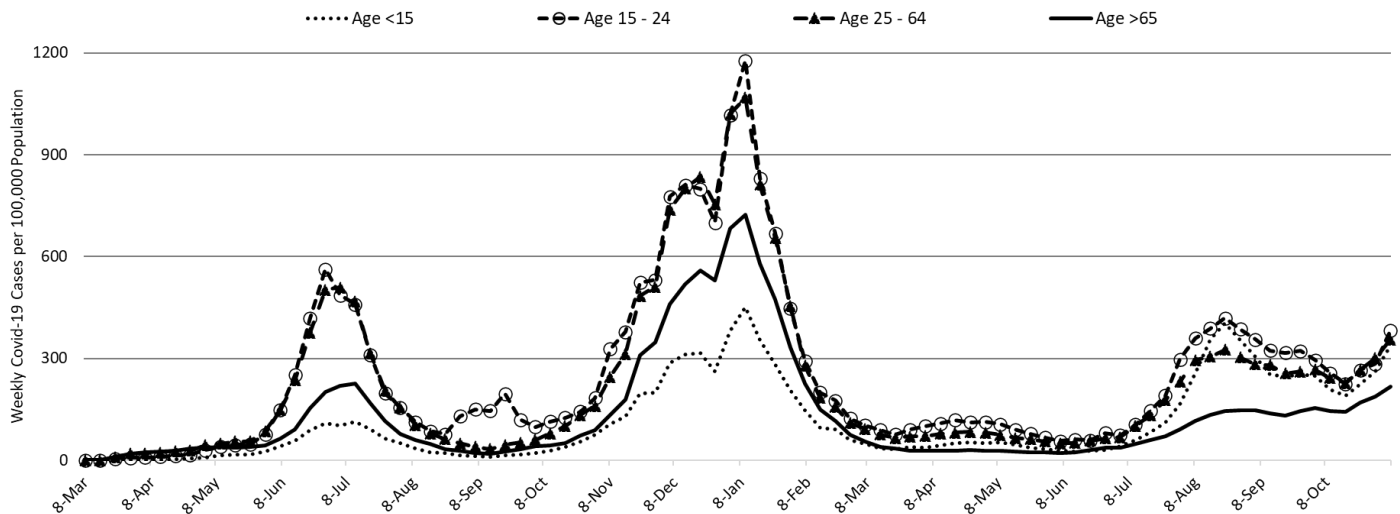


Figure 2A. COVID-19 Cases in Arizona by Age Group March 1, 2020 – November 7, 2021.