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# Arizona Reopening Phase 3 and COVID-19: After 30 Months

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## ABSTRACT

On March 5, 2021, Arizona's COVID-19 Reopening Phase 3 began. The state is the sixth largest in size of the United States 50 states and about the same size as Italy. The 30-month longitudinal study examined changes in the number of new COVID-19 cases, hospitalized cases, and deaths. There were increases of 1,678,981 COVID-19 cases, 84,409 case hospitalizations, and 17,498 deaths during the study period. Even with the five case surges, the new normal was low number of severe cases, manageable hospitalization numbers, and low number of deaths. At the end of the 30 months of the reopening, Arizona is in the endemic phase of COVID-19.

#### **Keywords**

Arizona and COVID-19, Longitudinal Study, Endemic Phase.

#### Introduction

It has been 44 months since COVID-19 (coronavirus) first appears in Arizona on January 22, 2020 [1]. The coronavirus is a respiratory disease (attacks primarily the lungs) that spreads from person to person through respiratory droplets (coughs, sneezes, and talks) and contaminated surfaces or objects. The virus is also known as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). There has been more than 2.5 million cases in the state since the beginning of the pandemic [2].

Arizona is the sixth largest in size (113,990 square miles / 295,233 square kilometers) of the U.S. 50 states and is about the same size as Italy (301,340 square kilometer) [3,4]. The state population estimate is 7,359,197 on July 1, 2022 [5]. There are total of 2,504,100 COVID-19 cases, 142,272 hospitalizations associated the virus, and 33,731 deaths on September 6, 2023 [2].

There had been three Arizona Reopening Phases. After the state had administered more than two million vaccine doses and several weeks of declining cases, Arizona Governor Douglas Ducey began Reopening Phase 3 (final reopening phase) on March 5, 2021 [6]. As more people became vaccinated and those infected recovered and had immunity against the virus; the numbers of severe cases, hospitalizations, and deaths were low; COVID-19 would be manageable; and the state returned to normal.

During Reopening Phase 3, a three prolong attack against the virus was used -- by encouraging the public to practice preventive health behaviors that reduces the risks of getting respiratory infections (e.g., coronavirus, flu, and cold), and using vaccines and therapeutics. Preventive health behaviors included, but were not limited to, practicing physical and social distancing, washing hands frequently and thoroughly, and wearing face masks to reduce exposure to the virus. Arizona Department of Health Services reported that more than 14.2 million vaccine doses had been administered in the state and Arizona had 4,677,816 fully vaccinated individuals on September 6, 2023 [2].

A partnership between the U.S. federal government and each of the 50 states was required to address the COVID-19 pandemic [7,8]. The federal government declared a national public health emergency, provided the national guidance primarily through the Centers for Disease Control and Prevention (CDC), and needed logistical support (e.g., provided federal supplemental funding, needed medical personnel and resources, and other needed assistance). The states determined what actions to take and when to carry out those actions; the state COVID-19 restrictions; when to carry out each reopening phase; the state vaccination plan; and when the pandemic emergency is over. Governor Ducey ended the COVID-19 Emergency Declaration on March 30, 2022. The remainder of the paper examined the 30 months of the reopening (March 5, 2021 to September 6, 2023) looking at changes in the number of new COVID-19 cases, hospitalizations, and deaths.

### **Methods**

This was a 30-month longitudinal study (March 5, 2021 to September 6, 2023). The Arizona Department of Health Services (the state health department) COVID-19 dashboard database was the source of data used. The study examined the changes in the numbers of new COVID-19 cases, hospitalized cases, deaths, and vaccines administered.

There were data limitations. The COVID-19 case numbers represented the numbers of positive tests reported. When more than one test was given to the same person (e.g., during hospitalization, at work, at school, and mandatory testing), there were individual case duplications. Aggressive testing resulted in increases in false positive and false negative testing results. The case numbers did not include the most positive home testing results. The number of home testing significantly increased in the last six months of Reopening Phase 3. One could be infected by the virus more than once.

Delays in the data submitted to the state health department affected the timeliness of data reported and caused fluctuations in the number of cases, hospitalizations, deaths, and vaccinations. The case, hospitalization, death, and vaccination statistics did not use the same reporting periods. The state health department continued to adjust the reported numbers that may take more than a month to correct the numbers. The deaths associated with the coronavirus may cause by more than one serious underlying medical conditions, and the virus may not be the primary cause of death.

The public reporting period changed during February 2022. It had changed from daily to weekly reporting. The periodic data adjustments made it more difficult to track trends. As the result of the World Health Organization and the Biden Administration May 2023 declarations that the COVID-19 global and U.S. public health emergency were over, several agencies/organizations had stopped or limited the posting COVID-19 statistics. This made it more difficult to identify trends.

#### **Results**

Three COVID-19 case classifications were used in the study -mild (no symptoms), moderate (sick, but can recover at home), and severe (require hospitalization and/or result in death). Most people recovered and did not require hospitalization. During the study period, there were five case surges (Figure 1). In the first year, the dominant variant during the 2021 summer and fall surges was Delta, and Omicron was the dominant variant during the 2021-22 winter surge. Omicron was the dominant variant in the secondyear summer and winter surges, but the 2022-23 winter surge case numbers were significantly lower compared to the previous winter. There were no 2023 summer surge.



May 10, 20 Nov 8, 20 May 9, 21 Nov 7, 21 May 8, 22 Nov 6, 22 May 7, 23 Source: Arizona Department of Health Services Arizona COVID -19 Weekly Cases Graph \*Third year cases as of September 6.

At the end of the 30 months of Arizona Reopening Phase 3, there were increases of 1,678,981 COVID-19 cases, 84,409 case hospitalizations, and 17,498 deaths associated with the virus in Arizona (Table 1). Of the five six-month periods examined, the last six months (March 9 to September 6, 2023) had the highest percent of COVID-19 hospitalizations (13.52%), while the first six months (March 7 to September 4) had the highest percent who died (1.32%).

**Table 1:** Arizona Reopening Phase 3 Total Numbers of COVID-19 Cases,Hospitalizations, and Deaths:March 7, 2021 to September 6, 2023.

| Time Period                           | Cases     | Hospitalizations | Deaths        |
|---------------------------------------|-----------|------------------|---------------|
| March 7, 2021 to September 4, 2021    | 202,240   | 14,859 (7.35%)   | 2,674 (1.32%) |
| September 5, 2021 to March 9, 2022    | 959,959   | 35,035 (3.65%)   | 9,093 (0.95%) |
| March 10, 2022 to September 7, 2022   | 270,722   | 9,197 (3.40%)    | 3,072 (1.13%) |
| September 8, 2022 to March 8, 2023    | 186,014   | 17,212 (9.25%)   | 1,940 (1.04%) |
| March 9, 2023 to September 6, 2023    | 59,956    | 8,106 (13.52%)   | 719 (1.20%)   |
| March 7, 2021 to September<br>6, 2023 | 1,678,981 | 84,409           | 17,498        |

Source: Arizona Department of Health Services COVID-19 Dashboard. Arizona 2022 population estimate is 7,359,197, July 1, 2022 – U.S. Census.

The weekly total and weekly numbers of COVID-19 cases, hospitalized cases, and deaths during the past 6 months (March 8 through September 6, 2023) presented in Table 2. The largest weekly numbers of cases (4,262) and hospitalizations (482) occurred on March 15, 2023. The largest weekly number of deaths (79) was on April 19, 2023.

Number comparisons of COVID-19 cases, hospitalized cases, and deaths by age groups for the 30 months (on March 5, 2021 and September 6, 2023) presented in Figures 2-4. A case could be *mild*, *moderate*, and *severe*. There was an increase of 1,678,981 cases during the study period.

| Date        | Total Cases | Weekly Case | Tot. Hospital | Wk. Hospital | Tot. Deaths | Wk. Deaths |
|-------------|-------------|-------------|---------------|--------------|-------------|------------|
| 03-08-2023  | 2,444,144   | 3,850       | 134,166       | 468          | 33,102      | 26         |
| 03-15-2023  | 2,448,406   | 4,262       | 134,648       | 482          | 33,158      | 56         |
| 03-22-2023  | 2,451,062   | 2,656       | 135,100       | 452          | 33,190      | 32         |
| 03-29-2023  | 2,454,320   | 3,258       | 135,555       | 455          | 33,225      | 35         |
| 04-05-2023  | 2,457,251   | 2,931       | 135,980       | 425          | 33,258      | 33         |
| 04-12-2023  | 2,460,926   | 3,675       | 136,431       | 451          | 33,293      | 35         |
| 04-19-2023  | 2,464,334   | 3,408       | 136,817       | 386          | 33,372      | 79         |
| 04-26- 2023 | 2,468,340   | 4,006       | 137,224       | 407          | 33,395      | 23         |
| 05-03-2023  | 2,471,546   | 3,206       | 137,682       | 458          | 33,417      | 22         |
| 05-10-2023  | 2,474,154   | 2,608       | 138,109       | 427          | 33,451      | 34         |
| 05-17-2023  | 2,476,497   | 2,343       | 138,469       | 360          | 33,476      | 25         |
| 05-24-2023  | 2,478,214   | 1,717       | 138,774       | 305          | 33,502      | 26         |
| 05-31-2023  | 2,479,130   | 916         | 139,084       | 310          | 33,522      | 20         |
| 06-07-2023  | 2,480,752   | 1,622       | 139,381       | 297          | 33,538      | 16         |
| 06-14-2023  | 2,481,929   | 1,177       | 139,597       | 216          | 33,558      | 20         |
| 06-21-2023  | 2,483,082   | 1,153       | 139,816       | 219          | 33,578      | 20         |
| 06-28-2023  | 2,484,420   | 1,338       | 140,006       | 190          | 33,602      | 24         |
| 07-05-2023  | 2,485,727   | 1,307       | 140,194       | 188          | 33,609      | 7          |
| 07-12-2023  | 2,486,670   | 943         | 140,383       | 189          | 33,628      | 19         |
| 07-19-2023  | 2,488,094   | 1,424       | 140,570       | 187          | 33,646      | 18         |
| 07-26-2023  | 2,489,080   | 986         | 140,807       | 237          | 33,664      | 18         |
| 08-02-2023  | 2,490,780   | 1,700       | 140,998       | 191          | 33,686      | 22         |
| 08-09-2023  | 2,492,755   | 1,975       | 141,186       | 188          | 33,698      | 12         |
| 08-16-2023  | 2,495,080   | 2,325       | 141,369       | 183          | 33,711      | 13         |
| 08-23-2023  | 2,498,167   | 3,087       | 141,612       | 243          | 33,721      | 10         |
| 08-30-2023  | 2,501,624   | 3,457       | 141,887       | 275          | 33,729      | 8          |
| 09-06-2023  | 2,504,100   | 2,476       | 142,272       | 385          | 33,731      | 2          |

Arizona 2022 population estimate is 7,359,197, July 1, 2022 - U.S. Census.

The 20-44 years age group had the largest number of cases in the 30 months (Figure 2). There were more females (53.1%) than males (46.9%) who got the virus on September 6, 2023. The two largest state race/ethnicity groups diagnosed with COVID-19 were White, non-Hispanics (39%) and Hispanics (28%).



Figure 2. Arizona Reopening Phase 3 COVID -19 Cases by Age Groups on March 6, 2021 and Sept. 6, 2023

Source: Arizona Department of Health Services COVID-19 Cases by Age Groups Statistics

The percentages of total hospitalized cases (severe cases) decreased from 7 percent on March 6, 2021 to 6 percent on September 6, 2023. The case hospitalizations had increased by 84,409 during the study period. On September 6, those under 20 years of age had the lowest percent of total hospitalizations (5.4%), while seniors had the highest percent (46.0%). One and half percent of those under 20 years of age diagnosed with COVID-19 were hospitalized, while 18.9% of the seniors were hospitalized. There were more males (51.4%) than females (48.6%) hospitalized. The change in hospitalization numbers for each age group during the 30-month period are summarized in Figure 3.



Figure 3. Arizona Reopening Phase 3 Hospitalized COVID19 Cases by Age Groups on March 6, 2021 and Sept. 6, 2023

The change in the numbers of deaths for each age group during the 30 months is summarized in Figure 4. The numbers of deaths had increased by 17,498 during the study period. The rates of fatalities per 100,000 population increased 227.1 to 463.0. As expected,

Source: Arizona Department of Health Services Hospitalized COVID-19 Cases by Age Groups Statistics

those under 20 years of age had the lowest percent of total deaths (0.25%), and seniors had the highest percent (72.4%) on September 6. Those under 20 years diagnosed with COVID-19 had the lowest percent death (0.02%), while 7.1 percent of the seniors died. There were more males (58%) than females (42%) who died.





Source: Arizona Department of Health Services COVID-19 Deaths by Age Groups Statistics

There were four vaccines (Pfizer/BioNTech Comirnaty, Moderna Spikevax, Johnson & Johnson Jcovden, and Novavax Nuvaxivud) and three boosters available during the Reopening Phase 3. There were 12,153,414 vaccine doses administered, and 3,966,742 fully vaccinated against the virus (March 6, 2021 to September 6, 2023). After the first year of Reopening Phase 3, the vaccination rates had slowed as the vaccination hesitancy rose. Figure 5 shows the numbers of persons fully vaccinated.



Figure 5. Arizona Reopening Phase 3 COVID-19 Vaccination Numbers : March 5, 2021 to September 6, 2023

All the ages groups had increased their vaccination percentages during the 30 months. Those under 20 years of age had the lowest vaccination percentage, while those 65 years and older had the highest (Figure 6).





Source: Arizona Department of Health Services COVID-19 Vaccination Percentage by Age Groups Statistics

#### Conclusion

Several characteristics were seen in the Arizona COVID-19 population. Those who had highest risk of acquiring COVID-19 were those immune compromised, who had severe medical conditions, adult 65 and older, and those who were obese. Those adults 20-44 years were the age group that had the highest number of cases. As expected, those who are under 20 years of age had the lowest numbers of case hospitalizations and deaths, while those 65 and older had the highest numbers of cases than men, but men had higher percentage of hospitalizations and deaths than women. Those 65 and older had the highest vaccination percentage, while those under 20 years of age had the lowest percentage.

After 30 months of the Reopening Phase 3, the virus had not disappeared, but was still active in Arizona and in the endemic phase. There were periodic case surges. The state had moved to normal of low numbers of severe cases and deaths, and manageable hospitalization numbers.

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