



2020-2021 | Fresno County



COVID-19 Annual Report

Fresno County | Department of Public Health

Epidemiology Program | Hamed Gharibi, PhD, MEng, MPH

COVID-19 Annual Report

The COVID-19 Annual Report is published by the Fresno County Department of Public Health, Division of Epidemiology, Surveillance, and Data Management. In this report, Incidence Proportion and Mortality Rate of SARS-CoV-2 in Fresno County are presented. This report covers data (COVID-19, Multisystem Inflammatory Syndrome in Children (MIS-C), vaccination, and death due to COVID-19) from 2020 through 2021. This data is provisional, and subject to change.

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Abbreviations

(CDC) Centers for Disease Control and Prevention

(COVID-19) Coronavirus Disease 2019

(CRP) C-Reactive Protein

(ESR) Erythrocyte Sedimentation Rate

(HCP) Healthcare provider

(ICU) Intensive Care Unit

(IL-6) Interleukin 6

(IP) Incidence Proportion

(LDH) Lactic Acid Dehydrogenase

(MIS-C) Multisystem Inflammatory Syndrome in Children

(MIS-A) Multisystem Inflammatory Syndrome in Adults

(MR) Mortality Rate

(NH) Non-Hispanic

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Report Methods and Definitions

The data is extracted from the California Department of Public Health's California Reportable Disease Information Exchange (CalREDIE) and contains SARS-CoV-2 records from Fresno County by episode date in 2020 and 2021.

COVID-19: A respiratory disease caused by SARS-CoV-2; a new coronavirus discovered in 2019. The virus is thought to spread mainly from person to person through respiratory droplets produced when an infected person coughs, sneezes, or talks. Some people who are infected may not have symptoms (CDC, 2022).

SARS-CoV-2: Causative agent, a virus, of the disease COVID-19 (CDC, 2022).

Incidence: The number of new cases of a disease that develop in a defined population and specific time period divided by the number of people in the population that are at risk for developing the disease (CDC, Principles of Epidemiology, 2022).

Mortality: A Mortality Rate is a measure of the frequency of occurrence of death in a defined population during a specified interval (CDC, Principles of Epidemiology, 2022).

COVID-19 RT-PCR: The COVID-19 RT-PCR Test is a real-time reverse transcription polymerase chain reaction (rRT-PCR) test for the qualitative detection of nucleic acid from SARS-CoV-2 in upper and lower respiratory specimens (nasopharyngeal or oropharyngeal swabs, sputum, lower respiratory tract aspirates, bronchoalveolar lavage, and nasopharyngeal wash/aspirate) collected from individuals suspected of COVID-19 by a healthcare provider (HCP), as well as upper respiratory specimens (nasopharyngeal or oropharyngeal swabs, anterior nasal swabs, or mid-turbinate swabs) collected from any individual, including individuals without symptoms or other reasons to suspect COVID-19 (FDA, 2022).

Confirmed cases: PCR laboratory confirmed COVID-19 cases with a record created in CalREDIE.

Probable Cases: The majority of probable cases are antigen confirmed COVID-19 cases that have been reported and processed by FCDPH. Since antigen testing is frequently done as Point of Care testing within a medical facility there is likely higher levels of under-reporting than tests processed

by a lab. Probable cases can also include cases without a confirmatory positive lab but where COVID-19 was listed on the Death Certificate as a cause of death. Furthermore, at-home Antigen tests are not included in this report.

Total Cases: Includes both confirmed and probable cases.

Episode Date: Episode date is the earliest of the following dates: symptom onset date, diagnosis date, specimen collection date, test result date, date received, and date of death. It serves as the best approximation of the date of infection.

Race/Ethnicity: Hispanic or Latino may include cases from any race. Other races included non-Hispanic cases or cases with unknown ethnicity.

Gender: Reflects the selected Gender of an individual. Due to low case counts in other options, only male and female will be shown.

Fully vaccinated (Post-Vaccinated Case):

To be included in this list the following need to be true:

- 1 dose in a 1 dose series (Johnson&Johnson, J&J) or 2 doses of 2 dose series, AND ≥ 14 days between fully vaccinated date and episode date (for all vaccine types)

Partially Vaccinated Cases:

To be included in this list the following need to be true:

- Individuals who have received only the first dose of a 2-dose series and the episode date is ≥ 14 days from first dose (partially vaccinated date), OR
- Individuals who have received the second dose of a 2-dose series and the episode date is < 14 days from date of second dose.

MIS-C:

As described in the CDC Health Advisory (CDC, MIS-C 2022), “Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with Coronavirus Disease 2019 (COVID-19),” the case definition for MIS-C is:

An individual aged <21 years presenting with fever*, laboratory evidence of inflammation**, and evidence of clinically severe illness requiring hospitalization, with multisystem (>2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); AND

No alternative plausible diagnoses; AND

Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms.

* Fever >38.0°C for ≥24 hours, or report of subjective fever lasting ≥24 hours

**Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin

Equations

Incidence Proportion = (New Cases /Population size) * 100,000

As mentioned in (CDC, Principles of Epidemiology, 2022)

Mortality Rate= (Number of death /Population size) * 100,000

As mentioned in (CDC, Principles of Epidemiology, 2022)

Introduction

Fresno County, as shown in figure 1, is the 10th largest county in California by population size and is a mixture of both rural and metropolitan cities. Fresno City is the fifth largest city in California by population size. The county's population in 2020 and 2021 were 1,008,654 and 1,021,649, respectively, which was reported by the California Department of Finance (DOF).

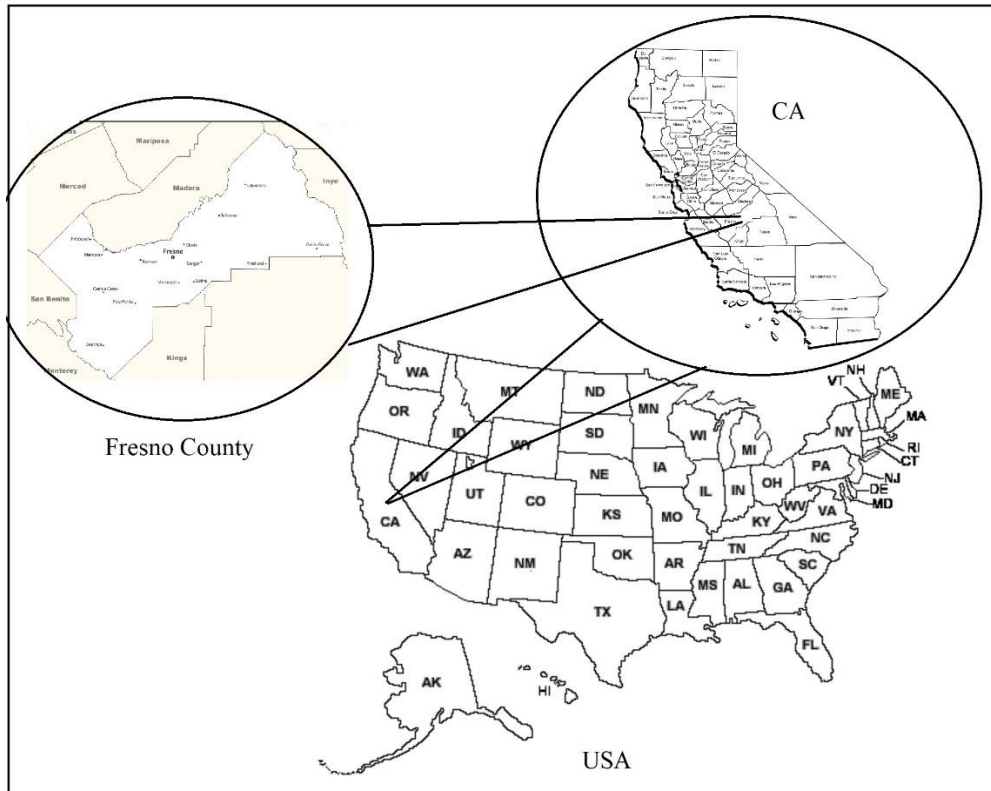


Figure 1: Fresno County

Background

The year 2020 was filled with unprecedented challenges in the realm of public health, the most difficult amongst those being the COVID-19 pandemic. The pandemic affected the Fresno County community's healthcare system in unexpected ways.

Fresno County got their first confirmed case in early March 2020.

By April 30, 2020 Fresno County had surged to over 1,000 confirmed cases.



SARS-CoV-2 in Fresno County in 2020 and 2021

Table 1 indicates the number and Incidence Proportion (IP) of SARS-CoV-2 cases in Fresno County in 2020 and 2021. As shown in the table, the IP for SARS-CoV-2 in Fresno County had increased from 7,670 per 100,000 individuals in 2020 to 8,934 per 100,000 individuals in 2021. It is noteworthy that the population estimate data for 2021 was not available for different race, age and gender groups. Among different age groups, in 2020 the highest IP was observed among those who were between 20 and 39 years old; the IP for those between 20 and 39 years old was 10,892 per 100,000 individuals. Among different race/ethnicities, the highest IP was seen among Hispanics; the IP among Hispanics was 6,638 per 100,000 individuals in 2020.

Table 1. The Incidence Proportion for SARS-CoV-2 (confirmed and probable cases) in Fresno County in 2020 and 2021

Variables	Year 2020			⁴ Year 2021		
	Population in 2020 (%)	# SARS-CoV-2 cases in 2020 (%)	Incidence Proportion per 100,000	Population in 2021 (%)	# SARS-CoV-2 cases in 2021 (%)	Incidence Proportion per 100,000
Total	1008654 (100.00)	78728 (100.00)	7670	1021649 (100.00)	91277 (100.00)	8934
Age ¹						
~0-19	318210 (31.00)	12889 (16.41)	4050	-	23307 (25.54)	-
~20-39	296120 (28.85)	32252 (41.05)	10892	-	34309 (37.59)	-
~40-59	226824 (22.10)	21689 (27.61)	9562	-	22048 (24.16)	-
~60-79	153687 (14.97)	9562 (12.17)	6222	-	9806 (10.74)	-
~80+	31517 (3.07)	2174 (2.77)	6898	-	1797 (1.97)	-
Race/Ethnicity						
White (NH)	309101 (30.12)	13380 (17.01)	4329	-	18718 (20.52)	-
Black (NH)	49945 (4.87)	1733 (2.20)	3470	-	3386 (3.71)	-
Asian (NH)	98179 (9.57)	5544 (7.05)	5647	-	6747 (7.39)	-
Hispanic or Latinos (any race)	541324 (52.74)	35932 (45.67)	6638	-	37976 (41.62)	-
Combined Races ²	27809 (2.71)	943 (1.20)	3391	-	1496 (1.64)	-
Other	-	3575 (4.54)	-	-	4562 (5.00)	-
Unknown	-	17621 (22.32)	-	-	18392 (20.12)	-
Gender ³						
Female	511538 (49.80)	40180 (51.014)	7855	-	47911 (52.49)	-
Male	514820 (50.20)	37722 (47.92)	7327	-	42764 (46.85)	-

1: There are 162 cases in 2020 and 10 cases in 2021 with missing age; 2: Due to relatively small percentage of cases in these groups, Combined Races include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), and Multiracial (NH); 3: There are 2 cases in 2020 and 1 case in 2021 with missing sex/gender. Note: The data regarding population for Fresno County is extracted from the California Department of Finances

4: The estimated population for different age, race and gender groups are only available up to the year 2020 and after that it is projection; The data can be accessed here <https://dof.ca.gov/forecasting/demographics/projections/> P-2B County Population by Age (the estimated population)

Figure 2 indicates 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date in Fresno County stratified by age from March 2020 to the end of 2021. As can be seen from the figure, there were three main surges, shown as Zone A, B and C, between March 2020 and December 2021. In zone A and B, the highest number of cases consisted of those who were between 20 to 59 years old; while in zone C, it consisted of those who were between 0 to 39 years old. Figure 3 indicates the 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date in Fresno County stratified by Race/Ethnicity from March 2020 to the end of 2021. In all three surges, as shown in the figure, Hispanics had the highest number of cases compared with other race/ethnicities. Stratifying race/ethnicity by age, as shown in Figure 4, with the aim of better understanding the difference in age categories in each race/ethnicity indicates that the highest number of cases in each category belongs to those who were between 20 and 39 years old.

It is noteworthy that this data is not normalized by population size in each age or race/ethnicity category.

Figure 5 indicates the 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date, hospitalized COVID-19 patients, COVID-19 patients in ICU, and number of deaths associated with COVID-19 in Fresno County stratified March 2020 to the end of the year 2021. As shown in the figure, each surge in the number of cases was shortly followed by increase in the number of hospitalizations, ICU patients, and deaths.

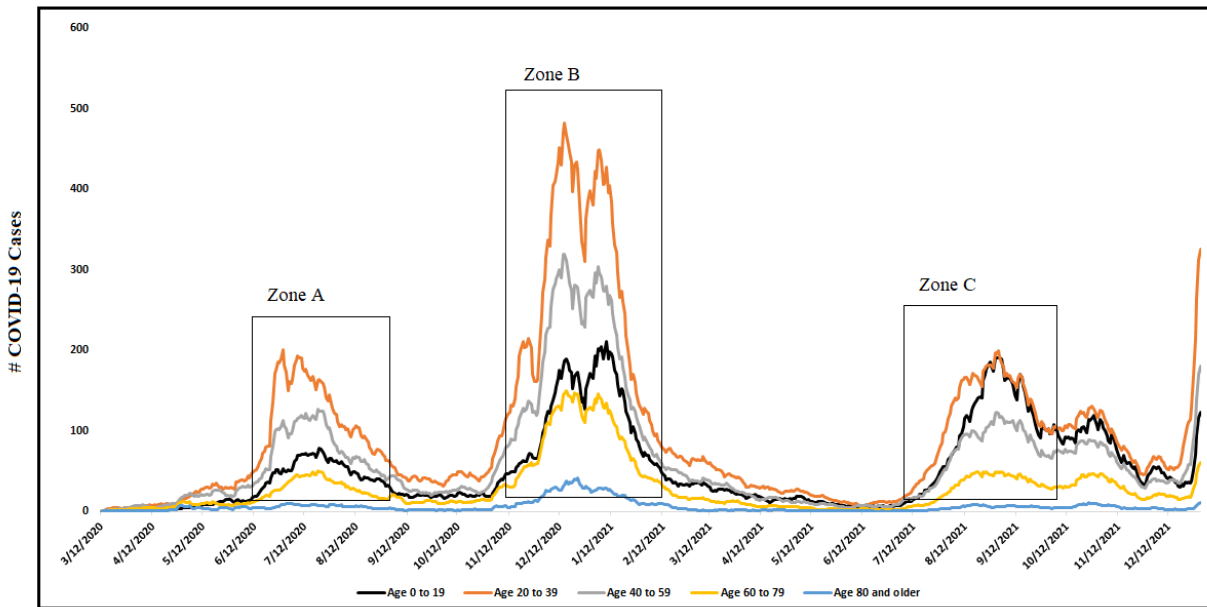


Figure 2: 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date among all population in Fresno County stratified by age from March 2020 to the end of the year 2021

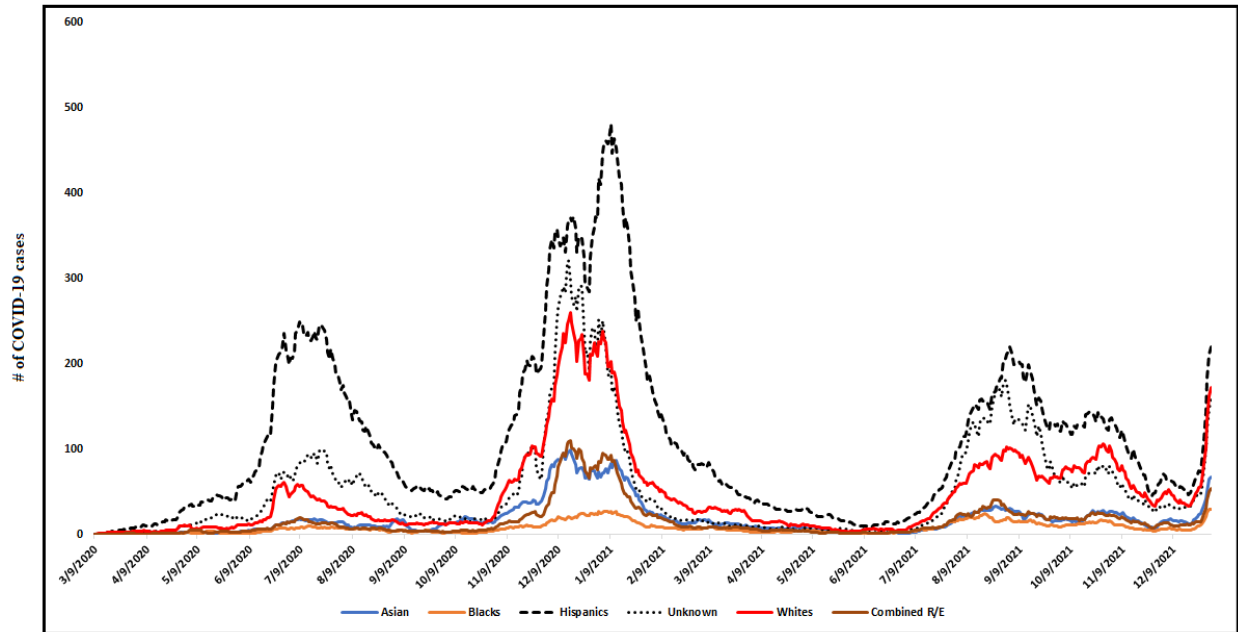


Figure 3: 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date among all population in Fresno County stratified by Race/Ethnicity from March 2020 to the end of the year 2021

* Combined Races include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), Multiracial (NH) and Other R/E

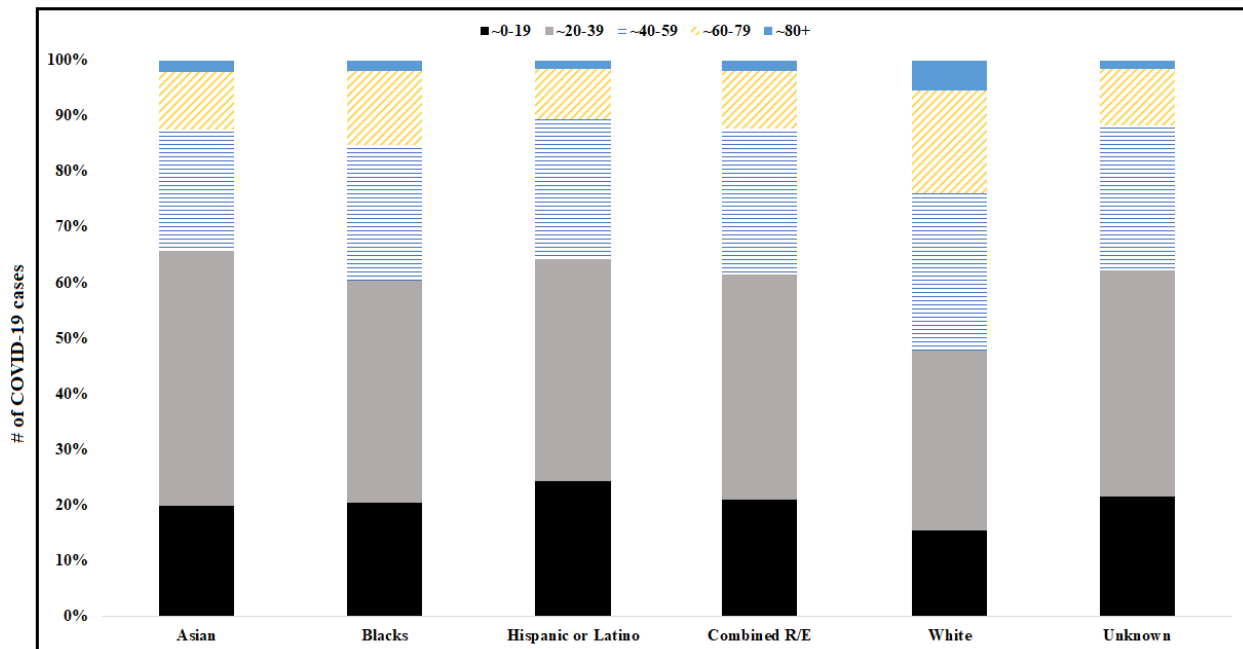


Figure 4: COVID-19 cases (confirmed and probable) by episode date among different races in Fresno County stratified by age in each Race/Ethnicity from March 2020 to the end of the year 2021

* Combined Races include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), Multiracial (NH) and Other R/E

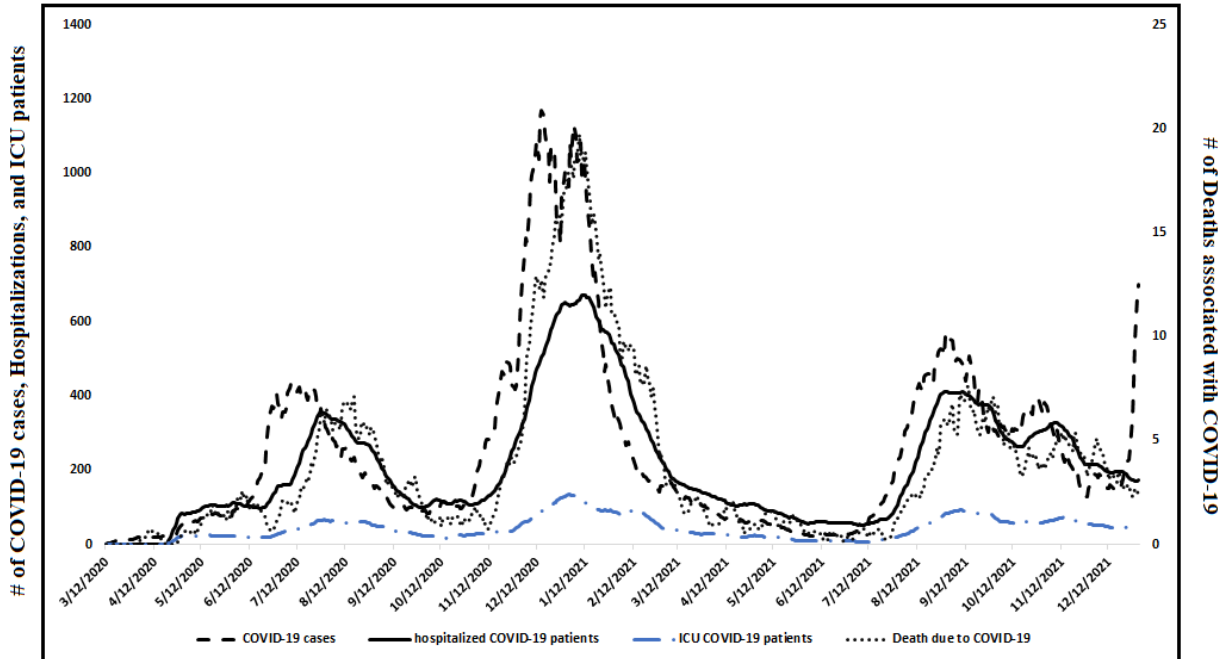


Figure 5: 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date, hospitalized COVID-19 patients, COVID-19 patients in ICU, and number of deaths associated with COVID-19 by date of death in Fresno County stratified March 2020 to the end of the year 2021

*The hospital and ICU data was taken from “California Health and Human Services Open Data Portal” at <https://data.chhs.ca.gov/>

SARS-CoV-2 in Communities of Fresno County

Table 2 indicates the IP for SARS-CoV-2 in communities of Fresno County in 2020 and 2021. As can be seen from the table, the highest IP was observed for Selma in Fresno County in both 2020 (13,501 per 100,000) and 2021 (13,546 per 100,000). For Fresno City, which has the highest population compared to the other cities in the county, the IP for the year 2020 and 2021 was, respectively, 8,326 and 10,203 per 100,000 individuals. Figure 6 indicates the percentage of COVID-19 cases (confirmed and probable) by episode date against the estimated population without a reported SARS-CoV-2 positive lab in communities in Fresno County from March 2020 to December 2021. In 2020, a higher percentage of the residents of Coalinga tested positive for SARS-CoV-2 in comparison with other communities in the county. It is noteworthy that Coalinga has Pleasant Valley State Prison (PVSP) which cases could be mixed into the population cases. Selma, Sanger, Orange Cove, Kerman, and Fowler, however, had higher percentages of their

population testing positive in 2021, compared to that of other cities in the county. Considering the differences in the number of cases in different age categories in each city in the Fresno County, as shown in figure 7, it was found that higher percentage of COVID-19 cases belonged to those who aged between 20 and 39 years old, particularly in Coalinga. The same analysis was conducted for race/ethnicity, as can be seen from figure 8, which shows that in most communities COVID-19 cases were higher among Hispanics, compared to other race/ethnicities. The COVID-19 distribution among different race/ethnicities correlates with the population demographics in terms of race/ethnicity; in other words, communities with a higher Hispanic population expect to see higher number of COVID-19 cases among Hispanics.

Table 2: The Incidence Proportion (IP) for SARS-CoV-2 in Fresno County Communities* in 2020 and 2021

	Population in	SARS-CoV-2	Incidence		SARS-CoV-2 Cases	Incidence	
			2020	Cases 2020		Proportion per	100,000
Fresno County	118741	6939	5844	121834	9942	8160	
Clovis	17177	3264	19002	16748	1587	9476	
Coalinga	8035	791	9844	8126	893	10989	
Firebaugh	6436	792	12306	6601	871	13195	
Fowler	543451	45250	8326	546770	55788	10203	
Huron	7297	673	9223	7404	447	6037	
Kerman	15922	2002	12574	16118	1870	11602	
Kingsburg	12879	1086	8432	13084	1306	9982	
Mendota	12424	1495	12033	12448	836	6716	
Orange Cove	9562	1183	12372	9581	1191	12431	
Parlier	15797	1991	12604	15828	1651	10431	
Reedley	25974	2780	10703	26087	2802	10741	
Sanger	27157	3454	12719	27353	3810	13929	
San Joaquin	4137	329	7953	4145	451	10881	
Selma	24405	3295	13501	24487	3317	13546	

Note: The data regarding population for Fresno County is extracted from Department of Finance; The data can be accessed at (<https://dof.ca.gov/forecasting/demographics/estimates/>) E-5 Population and Housing Estimates for Cities, Counties, and the State

The COVID-19 cases represent both confirmed and probable cases by episode date

For the year 2020, the extracted data is from March 2020 to the end of the year 2020

**Locations with smaller case counts excluded*

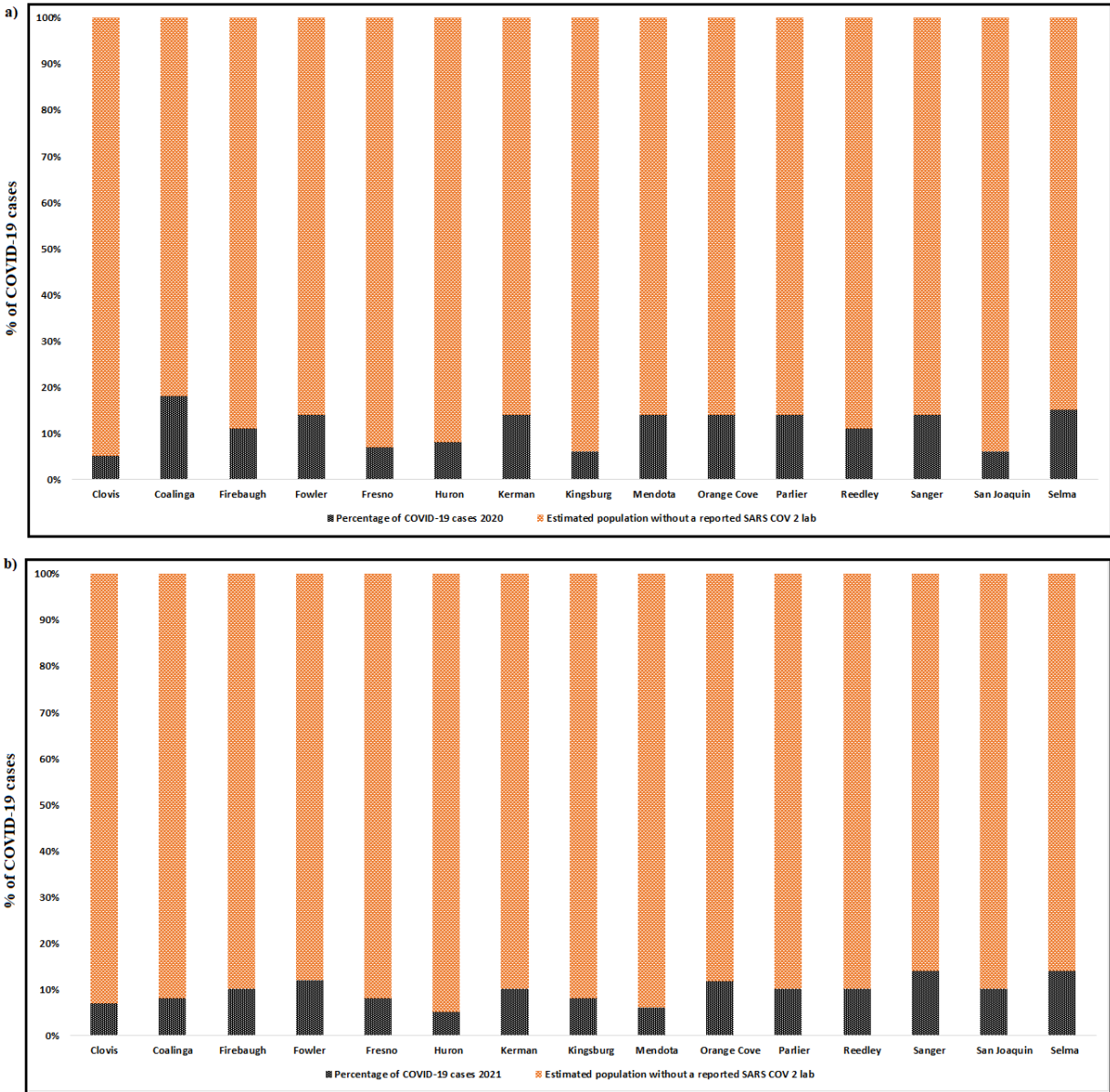


Figure 6: The percentage of COVID-19 cases (confirmed and probable) by episode date in Fresno County communities from May 2020 to December 2021; a) year 2020; b) year 2021

* Coalinga has Pleasant Valley State Prison (PVSP) which its cases are mixed into the population cases

Note: The data regarding population for Fresno County is extracted from Department of Finance; The data can be accessed at (<https://dof.ca.gov/forecasting/demographics/estimates/>) E-5 Population and Housing Estimates for Cities, Counties, and the State

Locations with smaller case counts excluded

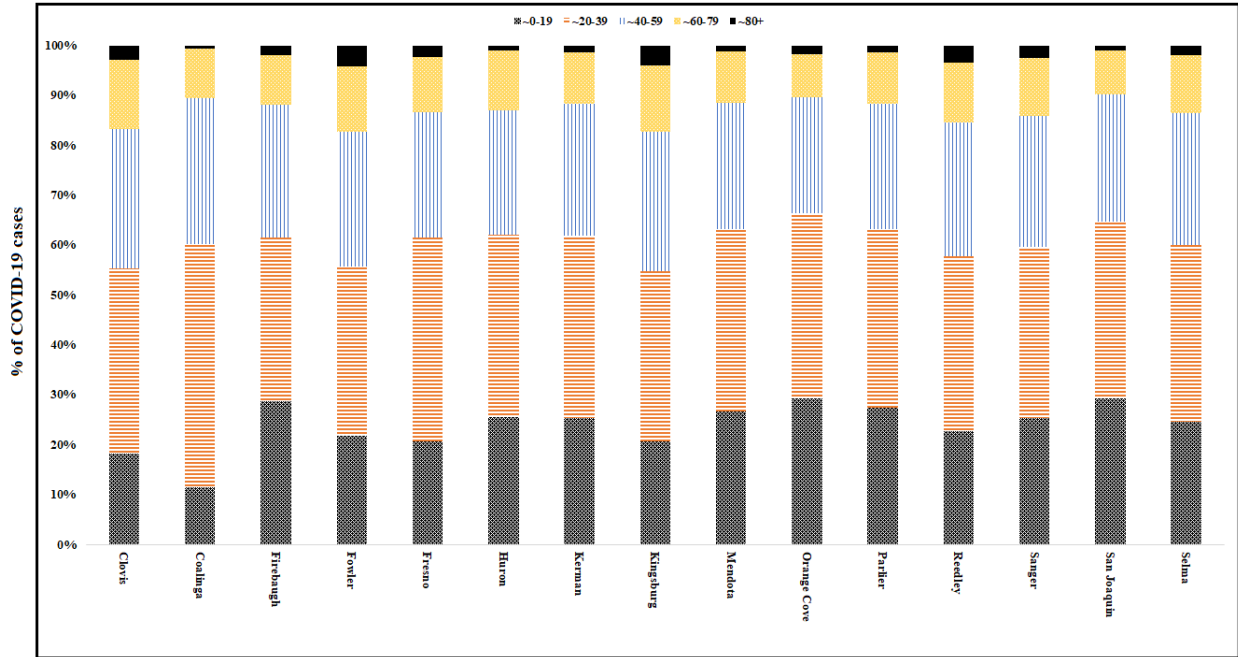


Figure 7: The percentage of COVID-19 cases (confirmed and probable) from May 2020 to December 2021 in Fresno County communities stratified by age

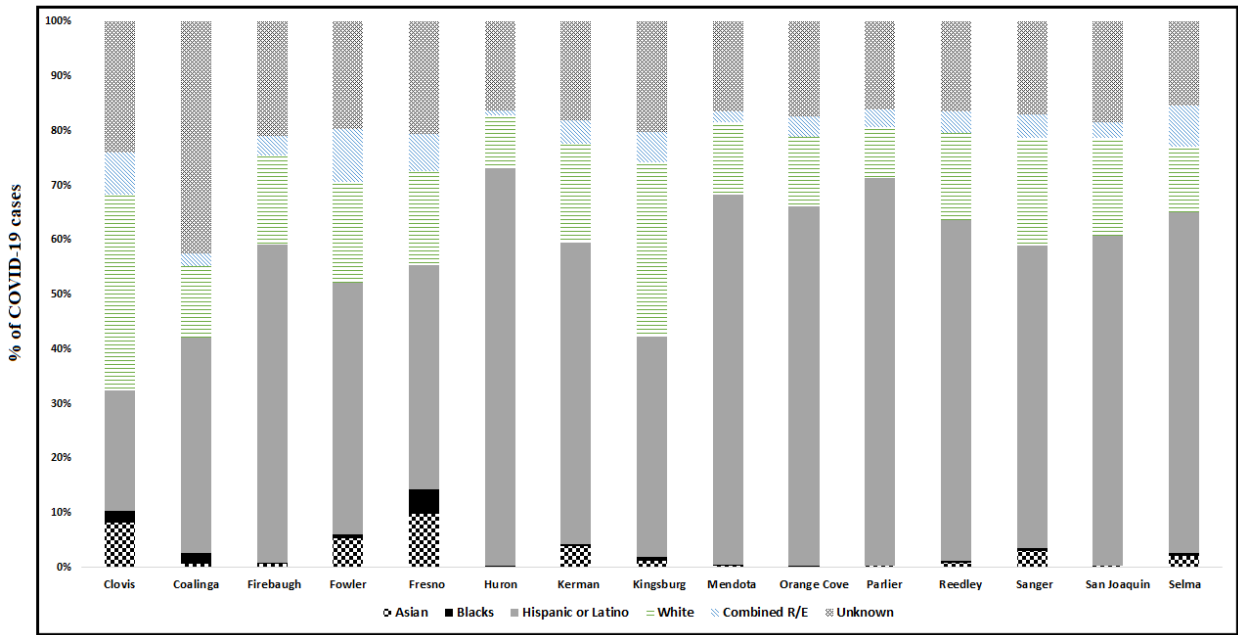


Figure 8: The percentage of COVID-19 cases (confirmed and probable) by episode date from May 2020 to December 2021 in Fresno County communities stratified by Race/Ethnicity

* Combined Race/Ethnicity include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), Multiracial (NH) and Other R/E

Locations with smaller case counts excluded

SARS-CoV-2 Cases among Youth Population

The IP for SARS-CoV-2 among the youth population (0-18 years) was 3,859 per 100,000 individuals in 2020. It is noteworthy that the estimated population for different age, race, and gender groups were only available prior to 2021. Among different age groups, as shown in table 3, the highest IP was found for those who aged between 12 and 18 years old; the IP for this age group was 5,132 per 100,000 individuals in 2020. Hispanics, compared with other race/ethnicities, had higher IP for SARS-CoV-2; as shown in table 3, the IP for SARS-CoV-2 among Hispanics was 3,527 per 100,000 individuals in 2020.

Figure 9 indicates the 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date among youth population in Fresno County stratified by race/ethnicity from March 2020 to the end of the year 2021. As can be seen from the figure, youth population among Hispanics had the higher COVID-19 cases compared with other race/ethnicities over time in the Fresno County. Among different age groups in each race/ethnicity, as shown in figure 10, it was found that in most of the race/ethnicities those who were between 12 to 18 years old had higher percentage of COVID-19 cases, compared to other age groups in each race/ethnicity.

Table 3. The Incidence Proportion for SARS-CoV-2 among youth population in Fresno County in 2020 and 2021

Variables	Year 2020			Year 2021		
	Population (%)	# SARS-CoV-2 cases (%)	Incidence Proportion per 100,000	Population (%)	# SARS-CoV-2 cases (%)	Incidence Proportion per 100,000
Total	299682 (100.00)	11567 (100.00)	3859	-	21808 (100.00)	-
Age						
0 to 4	74411 (24.83)	2371 (20.50)	3186	-	3549 (16.27)	-
5 to 11	113051 (37.72)	3439 (29.73)	3042	-	8052 (36.92)	-
12 to 18	112220 (37.45)	5759 (49.77)	5132	-	10207 (46.80)	-
Race/Ethnicity						
White (NH)	65561 (21.88)	1355 (11.72)	2067	-	3116 (14.29)	-
Black (NH)	14778 (4.93)	181 (1.57)	1225	-	787 (3.61)	-
Asian (NH)	27584 (9.21)	732 (6.33)	2654	-	1501 (6.89)	-
Combined R/E (NH)	10698 (3.56)	132 (1.14)	1234	-	327 (1.50)	-
Hispanic (any race)	181039 (60.41)	6386 (55.25)	3527	-	10193 (46.75)	-
Other	-	513 (4.44)	-	-	1060 (4.86)	-
Unknown	-	2259 (19.54)	-	-	4817 (22.10)	-
Gender**						
Female	146220 (48.70)	5962 (51.54)	4077	-	10771 (49.39)	-
Male	153440 (51.30)	5528 (47.79)	3602	-	10866 (49.83)	-

*Combined Races include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), and Multiracial (NH)

** 77 individuals were found in 2020 with unknown sex/gender; 171 individuals were found in 2021 with unknown sex/gender

Note: The estimated population for different age, race and gender groups are only available up to the year 2020; The data can be accessed here [https://dof.ca.gov/forecasting/demographics/projections/ P-2B County Population by Age](https://dof.ca.gov/forecasting/demographics/projections/P-2B%20County%20Population%20by%20Age) (the estimated population)

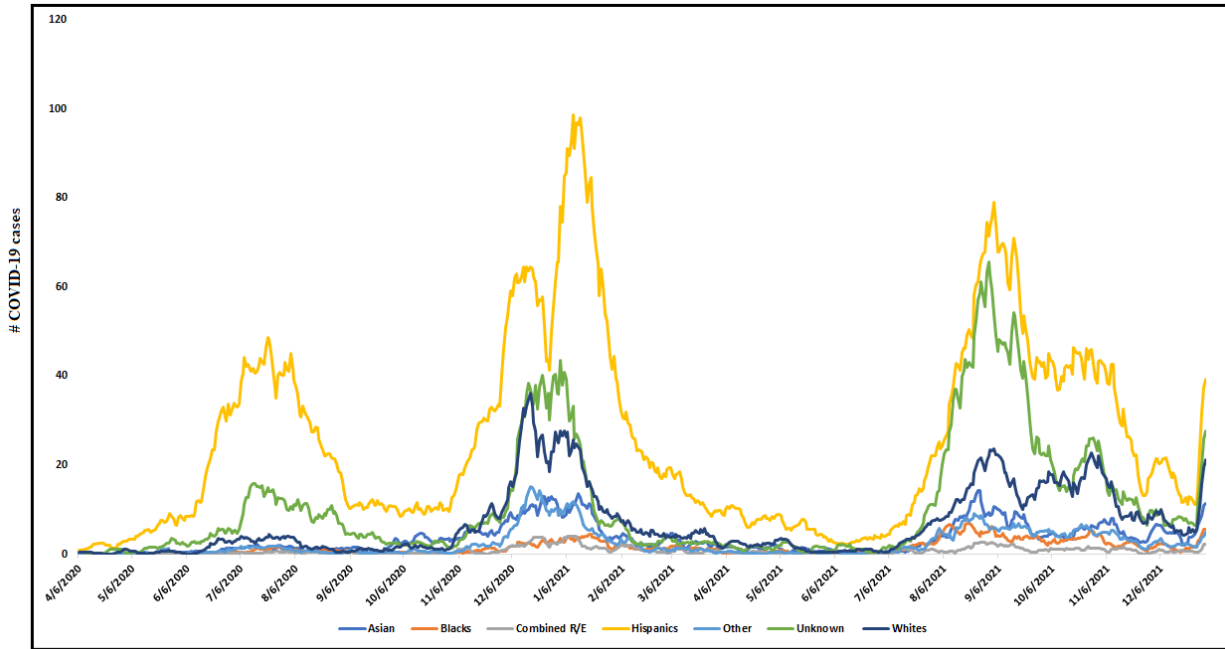


Figure 9: 7-Day moving average of COVID-19 cases (confirmed and probable) by episode date among youth population in Fresno County stratified by Race/Ethnicity from March 2020 to the end of the year 2021

* Combined Races include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), and Multiracial (NH)

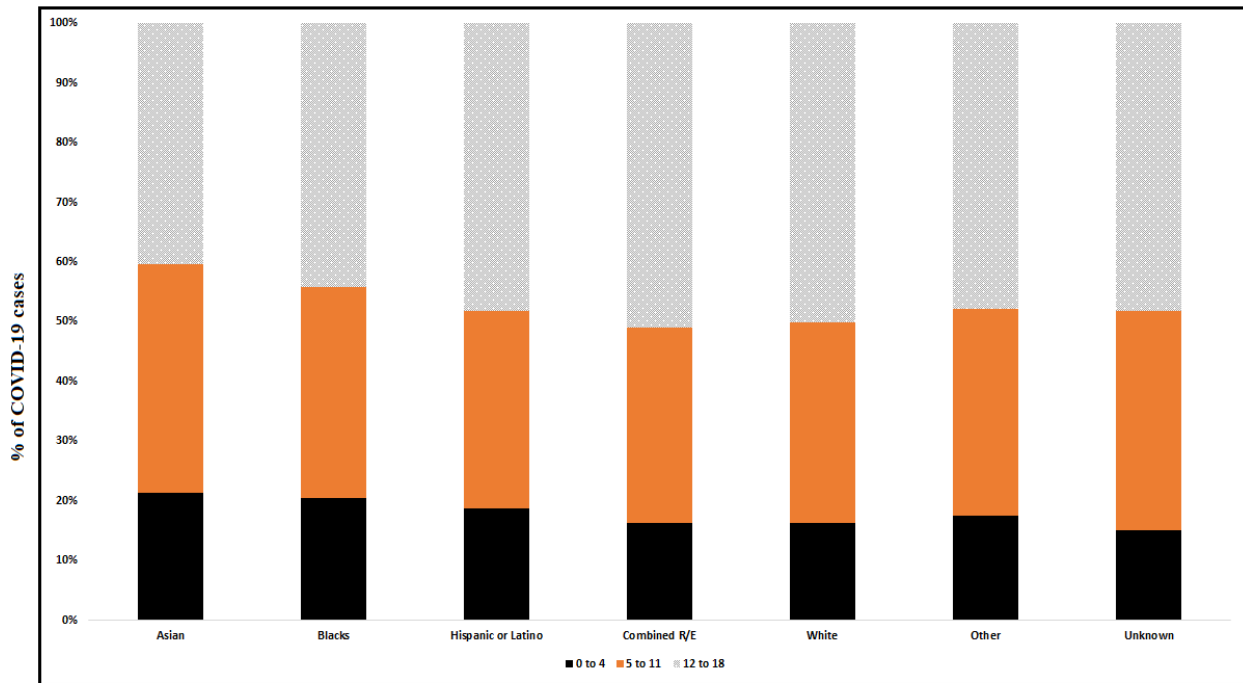


Figure 10: COVID-19 cases (confirmed and probable) among youth population by episode date for different race/ethnicities in Fresno County stratified by age in each race/ethnicity from March 2020 to the end of the year 2021

Fresno County Vaccination Status of Confirmed COVID-19 Cases

Figure 14 indicates the monthly percentage of COVID-19 cases stratified by vaccination status in Fresno County in 2021. A higher percentage of COVID-19 cases did not meet the fully vaccinated criteria than did meet the criteria, as shown in the figure. It is noteworthy that the increase in the percentage of COVID-19 cases meeting the fully vaccinated criteria at the end of 2021, could have been impacted by an increase in the total number of vaccinated individuals in the county.

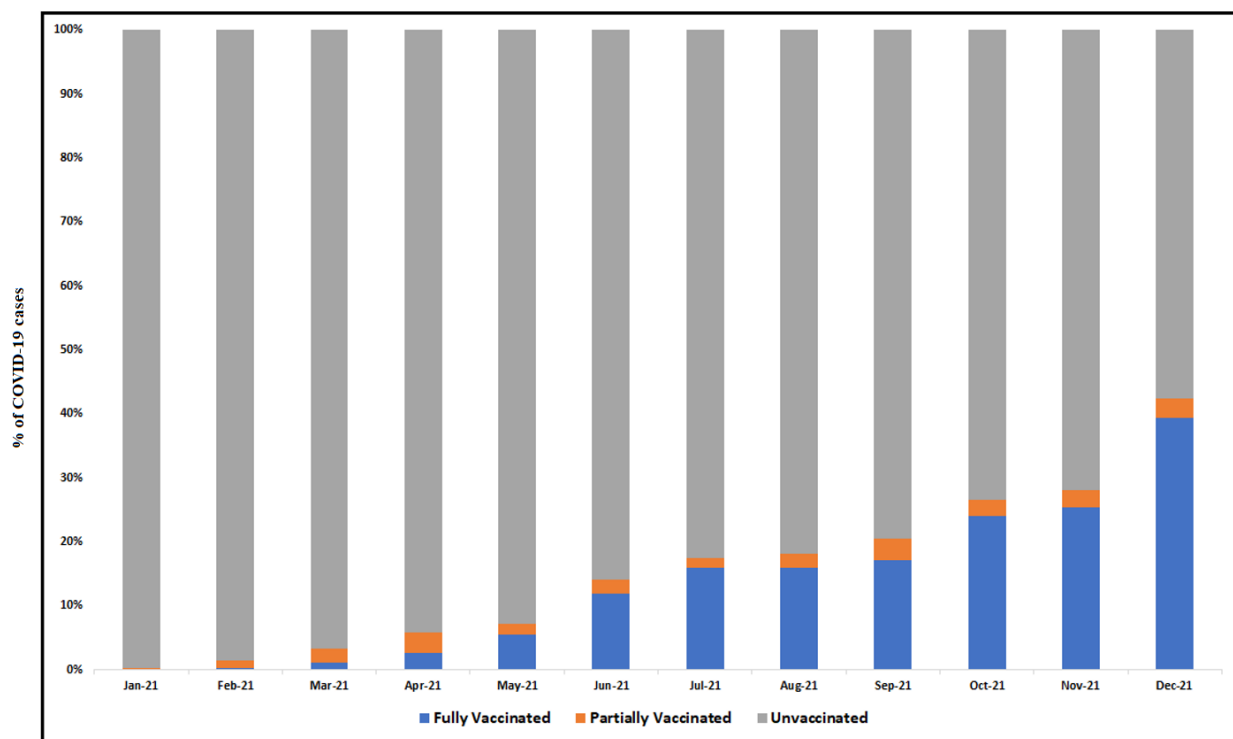


Figure 14: Monthly Percentage of COVID-19 cases stratified by vaccination status in Fresno County in 2021

SARS-CoV-2 Mortality in Fresno County in 2021

If a Fresno County death is determined to be unrelated to COVID-19 after review by the Fresno County Department of Public Health, the death would not be in the COVID-19 associated counts presented in this report regardless of positive lab. Only the COVID-19 associated deaths based on death certificate or health department assessment are counted (after the death is registered), and confirmed deaths require a positive PCR test. In this report, deaths are counted based on the county where the associated COVID-19 case in CalREDIE was counted, which does not always align with permanent residence and will vary from the method used in the Fresno County Leading Cause of Death report based on State of California's Integrated Vital Records System (Cal-IVRS). The analysis indicated that the highest SARS-CoV-2 Mortality Rate (MR) per 100,000 individuals (among both confirmed and probable cases) in 2020 was among those aged 80 years and older; as shown in table 4, the MR among 80 years and older was 1,206 per 100,000 individuals in 2020. The highest MR was found among Hispanics in 2020 (103 per 100,000 individuals). Furthermore, comparing the MR between males and females, it was found that MR is higher among males in 2020. It was also found that among COVID-19 associated deaths, those aged between 60 and 79 years old contributed a general higher percentage of deaths among each race/ethnicity, as shown in figure 11; however, it should be noted that the MR is higher among those who aged 80+ years old compared to that of 60 and 79 years old since the population of those who aged 80+ years old is less than the population in the group of 60 to 79 years old. In other words, although the number of death due to COVID-19 is close to each other in both groups, the denominator for calculating MR for those who aged between 60 and 79 years old is much higher than that of 80+years old.

Table 4: The Mortality Rate per 100,000 individuals for SARS-CoV-2 in Fresno County in 2020 and 2021

Variables	Year 2020			Year 2021		
	Population in 2020 (%)	# Death due to SARS-CoV-2 (%)	Mortality Rate per 100,000	Population in 2021 (%)	# Death due to SARS-CoV-2 (%)	Mortality Rate per 100,000
		1011 (100.00)			1495 (100.00)	
Age						
~0-19	318210 (31.00)	-	-	-	-	-
~20-39	296120 (28.85)	25 (2.00)	8	-	73 (4.50)	-
~40-59	226824 (22.10)	168 (16.50)	74	-	307 (20.00)	-
~60-79	153687 (14.97)	444 (43.00)	289	-	712 (47.00)	-
~80+	31517 (3.07)	380 (37.00)	1206	-	414 (27.50)	-
Race/Ethnicity						
White (NH)	309101 (30.12)	312 (31.00)	101	-	486 (32.00)	-
Black (NH)	49945 (4.87)	37 (3.5)	74	-	80 (5.30)	-
Asian (NH)	98179 (9.57)	82 (8.00)	84	-	150 (10.00)	-
Hispanic (any race)	541324 (52.74)	559 (55.00)	103	-	732 (49.00)	-
Combined Races ¹	27809 (2.71)	-	-	-	36 (2.50)	-
Other	-	-	-	-	-	-
Unknown	-	16 (1.50)	-	-	16 (1.00)	-
Gender						
Female	511538 (49.80)	411 (40.50)	80	-	660 (44.00)	-
Male	514820 (50.20)	600 (58.00)	116	-	835 (55.50)	-

1: Combined Races include American Indian or Alaska Native (NH), Native Hawaiian or Pacific Islander (NH), and Multiracial (NH)

Note: The estimated population for different age, race and gender groups are only available up to the year 2020; The data can be accessed here <https://dof.ca.gov/forecasting/demographics/projections/> P-2B County Population by Age (the estimated population)

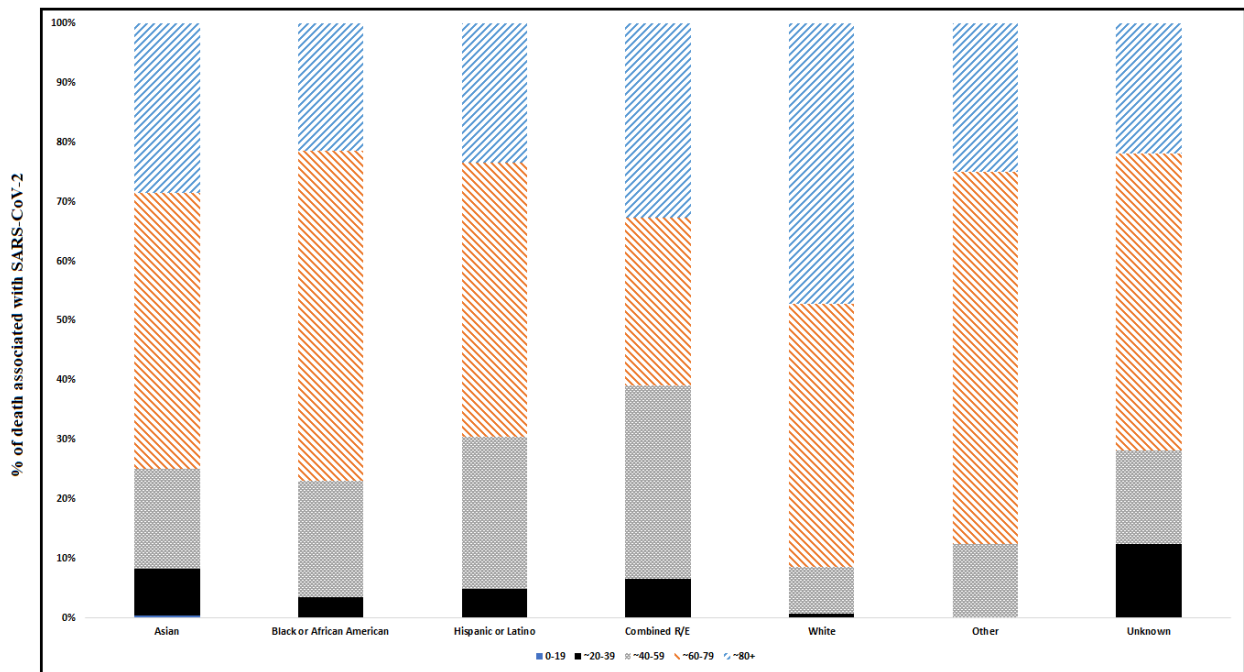


Figure 11: The percentage of death associated with SARS-CoV-2* from March 2020 to December 2021 in Fresno County among different race/ethnicities stratified by age

Investigating the number of death associated with COVID-19 and vaccination status, it was found that those who did not meet fully vaccinated criteria accounted for a higher percentage of death due to COVID-19 than those who did meet the fully vaccinated criteria (i. e. 91% did not meet the fully vaccinated criteria compared to 9% who met the fully vaccinated criteria), as shown in figure 12 and 13.

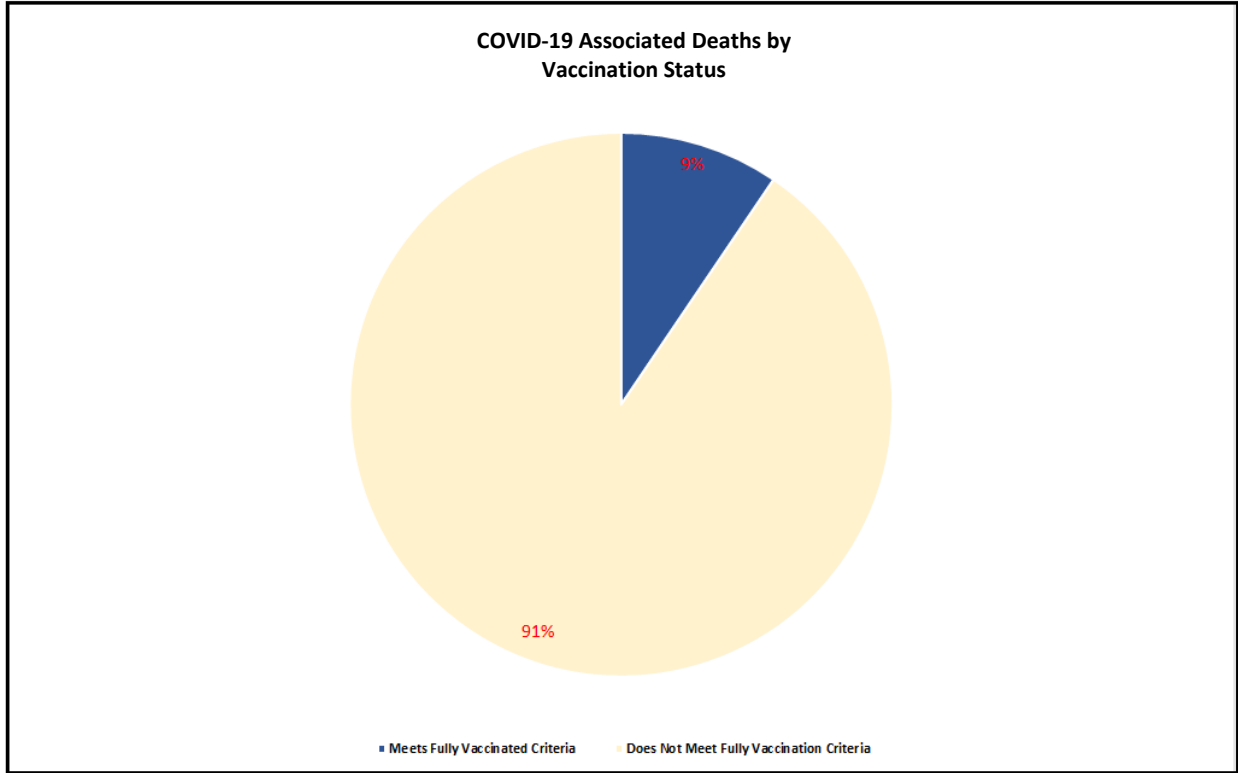


Figure 12: COVID-19 associated death by vaccination status in 2020 and 2021 in Fresno County

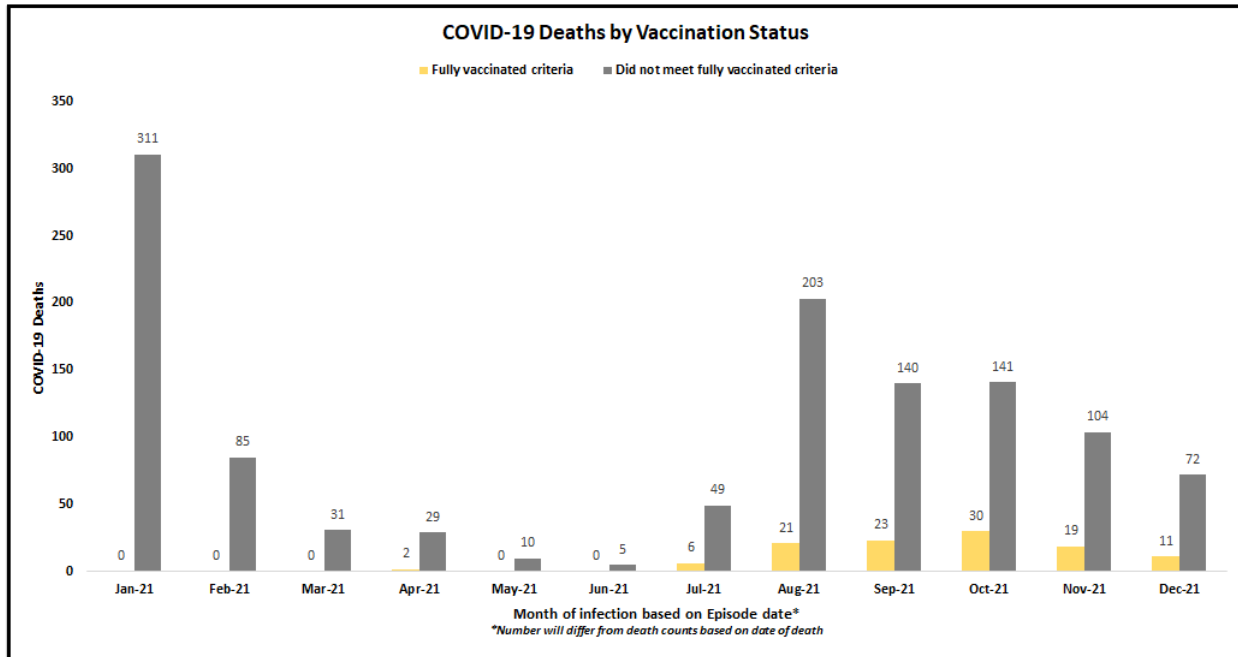


Figure 13: Monthly COVID-19 associated deaths in Fresno County by vaccination status

Multisystem Inflammatory Syndrome (MIS-C) associated with Coronavirus Disease 2019 (COVID-19)

As stated by CDC (CDC, 2022), “Multisystem inflammatory syndrome (MIS) can affect children (MIS-C) and adults (MIS-A). MIS is a rare but serious condition associated with COVID-19 in which different body parts become inflamed, including the heart, lungs, kidneys, brain, skin, eyes, or gastrointestinal organs.” Among different age groups for this syndrome in 2020 and 2021, as shown in figure 15, those aged between 5 and 11 years old made up a higher percentage of MIS-C cases (41%), compared with other age groups. The 12 to 21 age group followed closely behind with 40% of the MIS-C cases. Categorized by race/ethnicity, it was found that Hispanics made up the highest percentage of MIS-C cases as shown in figure 16. Further stratifying age by race/ethnicity, figure 17, indicated that Hispanics and Non-Hispanic Whites made up the highest percentage of MIS-C cases regardless of age category.

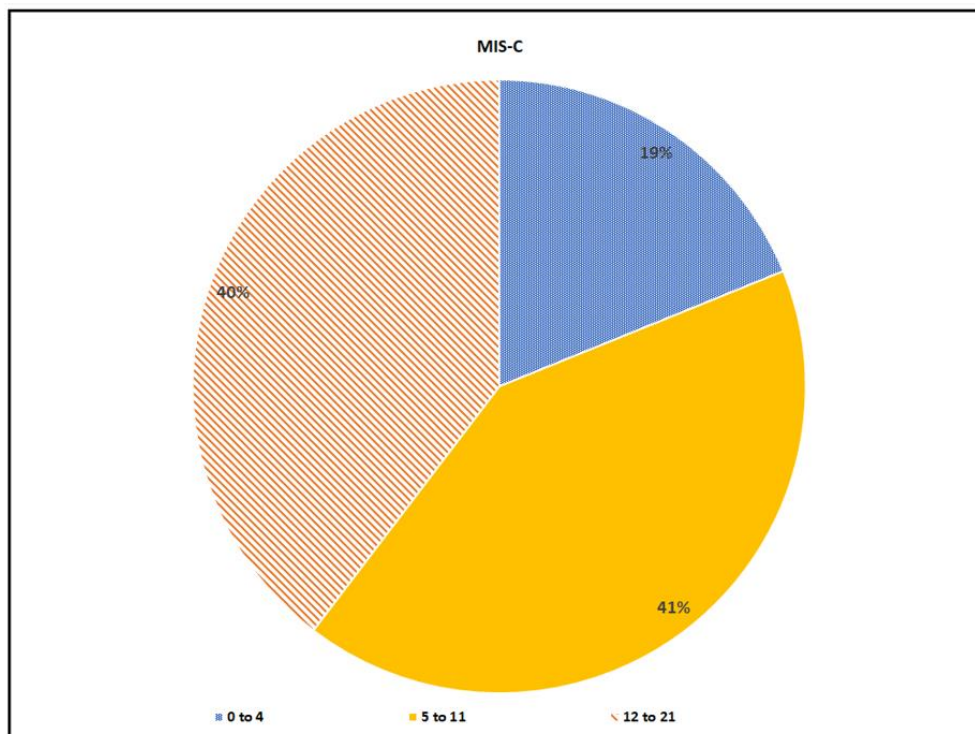


Figure 15: MIS-C patients by age in Fresno County in 2020 and 2021

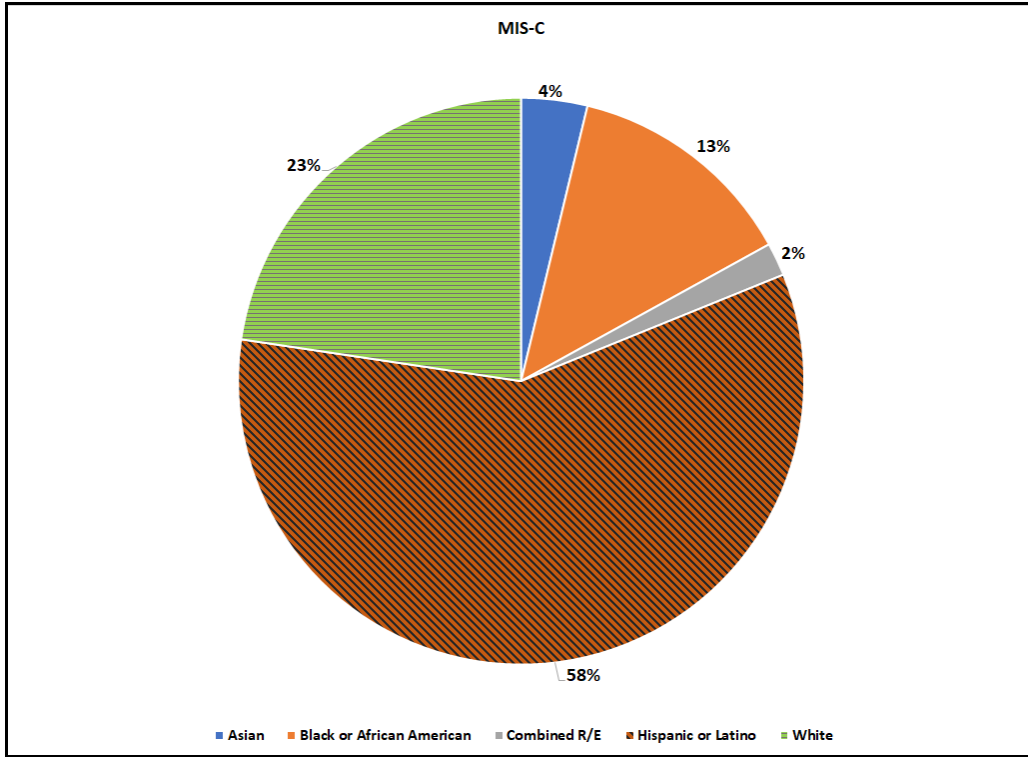


Figure 16: MIS-C Patients by Race & Ethnicity in Fresno County

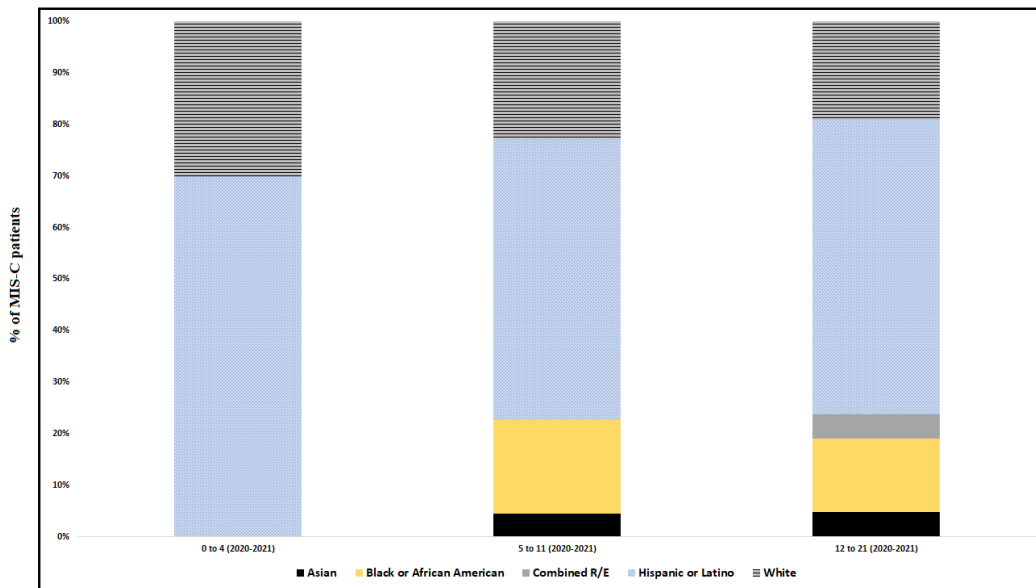


Figure 17: MIS-C patients by age stratified by Race/Ethnicity in Fresno County

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<https://www.cdc.gov/mis/index.html#:~:text=What%20is%20MIS%3F,%2C%20eyes%2C%20or%20gastrointestinal%20organs>. (Time accessed: 6/28/2022)

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[c/hcp/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fmis%2Fhcp%2Findex.html](https://www.cdc.gov/mis/mis-c/hcp/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fmis%2Fhcp%2Findex.html)

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