

Shasta County COVID-19 Hospitalization and Death Report: 2021

Prepared by Shasta County Health and Human Services Agency; Office of the Director; Outcomes, Planning, and Evaluation Unit. Data Last Updated: 3/9/2022

Data are preliminary and subject to change as records of approximately 26 of the 2021 deaths are pending and review and inclusion of hospital records is ongoing.

Number of Shasta County residents who have been hospitalized due to COVID-19 in 2021: 818

Number of Shasta County residents who have died due to COVID-19 in 2021: 401

Key Findings

Cases Over Time: In 2021, the greatest number of hospitalizations throughout the pandemic occurred in Quarter 3 (July-September) and the greatest number of deaths throughout the pandemic occurred in Quarter 4 (October-December). This is reflective of the wave caused by the Delta variant of the SARS-CoV-2 virus.

Length of Hospital Stay (LOS): Patients hospitalized for COVID-19 symptoms stayed an average of 10.5 (range 2-78 days), and 23.3% of patients needed ICU care. The average length of stay in the ICU was 12.0 days (range 0-72 days).

By Age: Risk of hospitalization and death due to COVID-19 increased consistently with age. The preliminary age-adjusted mortality rate for COVID-19 in Shasta County for 2021 was 160.0 per 100,000.

By Race and Ethnicity: Black, Indigenous, and People of Color are at higher risk of hospitalization and death from COVID-19. Our local Black, Indigenous, and People of Color population was 1.8 times more likely to be hospitalized for COVID-19 compared to white, non-Hispanics, and 1.5 times more likely to die from COVID-19 compared to white, non-Hispanics.

By Sex: Males are at higher risk of hospitalization and death from COVID-19. Males were 1.4 times more likely to be hospitalized for COVID-19 compared to females, and 1.8 times more likely to die.

By Vaccination Status: Data show that vaccination is highly effective at preventing hospitalization and death from COVID-19. Unvaccinated Shasta County residents were 7.8 times more likely to be hospitalized for COVID-19 and 9.8 times more likely to die from COVID-19 compared to those who were fully vaccinated.

By Comorbid Conditions: Comorbid (“Pre-Existing”) conditions were extremely common among both hospitalized patients and deceased individuals. This is not unexpected given the high prevalence of chronic conditions in the general population as well as the increased risk of severe COVID-19 illness that is associated with these pre-existing conditions i.e., high blood pressure, diabetes, heart disease, obesity, etc.

Residents of Congregate Settings: Congregate settings include skilled nursing facilities, assisted living facilities, homeless shelters, board and care residences, jail, and other locked or semi-locked facilities. In 2021, residents of congregate settings represented 8% of hospitalizations and 20% of deaths. The proportion of deaths coming from residents of congregate settings fell from 50% in 2020 to 20% in 2021.

This drop is reflective of the high vaccine coverage of both staff and residents of these congregate facilities.

Leading Cause of death: COVID-19 was determined to be the third leading cause of death for 2021.

Introduction

Purpose and Scope of this Report

The purpose of this report is to summarize characteristics and trends of COVID-19 cases residing in Shasta County who were hospitalized for COVID-19 illness or who passed away from COVID-19 in 2021. At this time, it is only a 2021 summary report, data from 2020 is not included for comparison. There were 117 deaths in 2020 From COVID-19.

Definitions

Definition of Hospitalization

The following criteria were used to define hospitalization status for this report:

- The patient must have been discharged at least 2 days after admission. This was used to exclude Emergency Department visits, same day discharge, and overnight observation. Total hospitalizations were 848 patients, this report also excludes 30 patients for whom length of stay was unknown.
- The patient must have tested positive for COVID-19 during the course of their current illness.
- The patient must have been treated for COVID-19 during their hospital stay. Incidental findings of COVID-19 that did not require in-hospital treatment were not counted. (i.e., they must be hospitalized *for* COVID-19, rather than just *with* COVID-19).
- The patient must be a Shasta County resident. Note: Limitations in data access prevent inclusion of non-Shasta County residents at this time. Therefore, the numbers in this report do not reflect the impact on Shasta County hospitals which care for patients who reside throughout our region.

Definition of COVID-19 Deaths

The following criteria were used to define COVID-19 deaths for this report:

- The case must meet the confirmed or probable COVID-19 surveillance case definition, AND at least ONE of the following criteria must be met:
 - a. A case investigation determined that COVID-19 was the cause of death or contributed to the death.
 - b. The death certificate indicates COVID-19 or an equivalent term as one of the causes of death.
- Each death certificate is reviewed and investigated by an epidemiologist to determine cause of death. The investigation process involves a thorough review of COVID-19 lab results, medical records, vaccination status, and cause of death listed on death certificate for each individual. After investigation is complete the final cause of death is reviewed and confirmed by the medical officers. If confirmed, the case is counted as a COVID-19 death and reported to the community.

Source: [CSTE COVID-19 Death Definition](#)

Definition of Vaccination

For the purpose of this analysis, vaccination status was defined as follows:

- Vaccinated individuals were defined as those who had their second vaccine dose or single-dose vaccine at least 2 weeks prior to becoming ill.

- Unvaccinated individuals are defined as those who had received zero vaccine doses as of 2 weeks prior to becoming ill.
- Those who had received one dose only of a two-dose series (partially vaccinated) or who had unknown vaccination status were excluded from analysis.
- The analysis does not account for additional doses recommended for immunocompromised individuals nor booster status.

Limitations

General Limitations

- This report estimates statistical significance using 95% confidence intervals for the age adjusted rates.
- With regard to race and ethnicity, please note that some racial and ethnic groups were excluded from the analysis because their small population sizes made the data unstable. The impact on populations excluded from analysis are monitored by HHSA.
- Lists of comorbid conditions are not comprehensive. They are limited to what was documented in the medical records (for hospitalizations), or the death certificates (for deaths).

Limitations of Hospitalization Data

- This data represents an **undercount** of hospitalizations, meaning that more hospitalizations occurred than able to be investigated at this time. Additional review of medical records is planned to correct for this issue.

Limitations of Death Data

- This data represents an **undercount** of mortality in Shasta County as 2021 death data are preliminary and 26 deaths are pending review. Data only represents Shasta County residents who expired in Shasta County, Shasta County residents residing in Shasta County but expired outside of Shasta County or nonresidents living in congregate settings in Shasta County during time of infection. The number of deaths currently reported potentially will increase as investigations are completed.

Limitations of Vaccination Data

- Please note that partially vaccinated people and those with unknown vaccination status were excluded from analysis of hospitalizations and deaths by vaccination status.
- The time period for analysis of vaccination status is April 1st to December 31st, 2021. April 1st is the date when vaccination was considered widely available for Shasta County adults.

Findings

General

- In 2021, 818 Shasta County residents were confirmed to have been hospitalized for COVID-19 symptoms for 2 days or longer.
- In 2021, 401 Shasta County residents were confirmed to have died from COVID-19.

Length of Hospital Stay

COVID-19 Hospitalizations by Length of Stay (LOS)

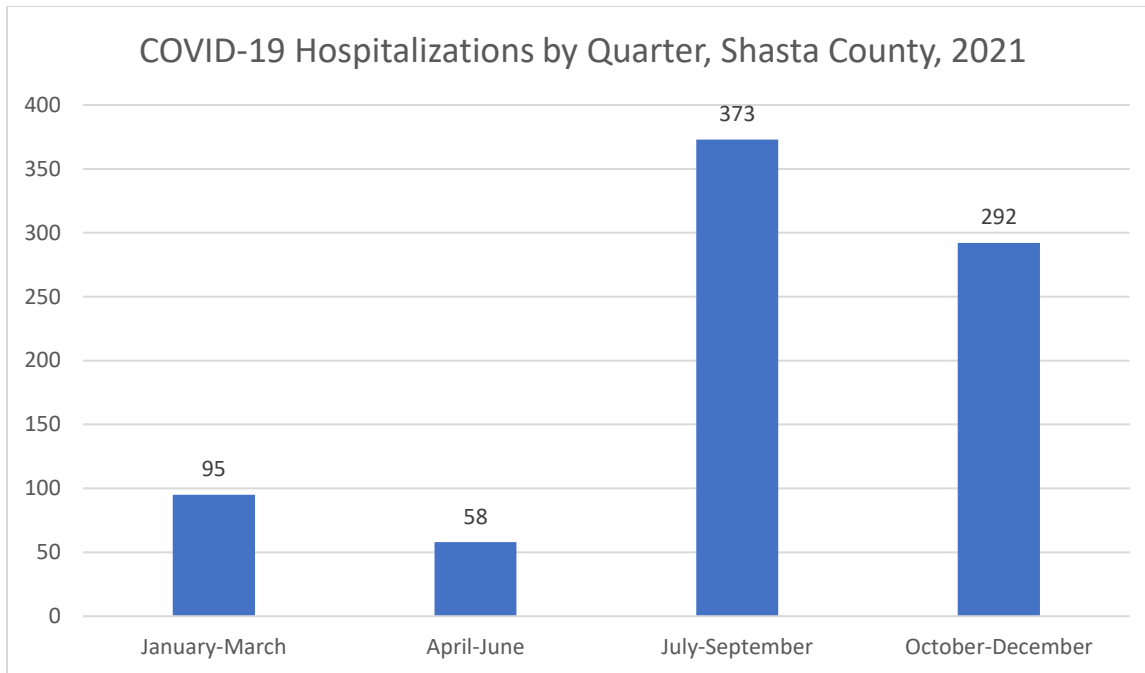
Measures related to length of stay are shown in the table below. In 2021, Shasta County residents were hospitalized an average of 10.5 days, with the median being 7 days. Of these, 23.3% needed to be admitted to the ICU. Those who were admitted to the ICU spent an average of 12 days in intensive care, with 9 days being the median.

	Number of Patients	LOS Average (days)	LOS Median (days)	LOS Range (days)	% Needing ICU Care
All Hospitalizations	818	10.5	7	2-78	23.3%
Intensive Care Unit	191	12.0	9	0-72	N/A

Cases Over Time (By Quarter in 2021)

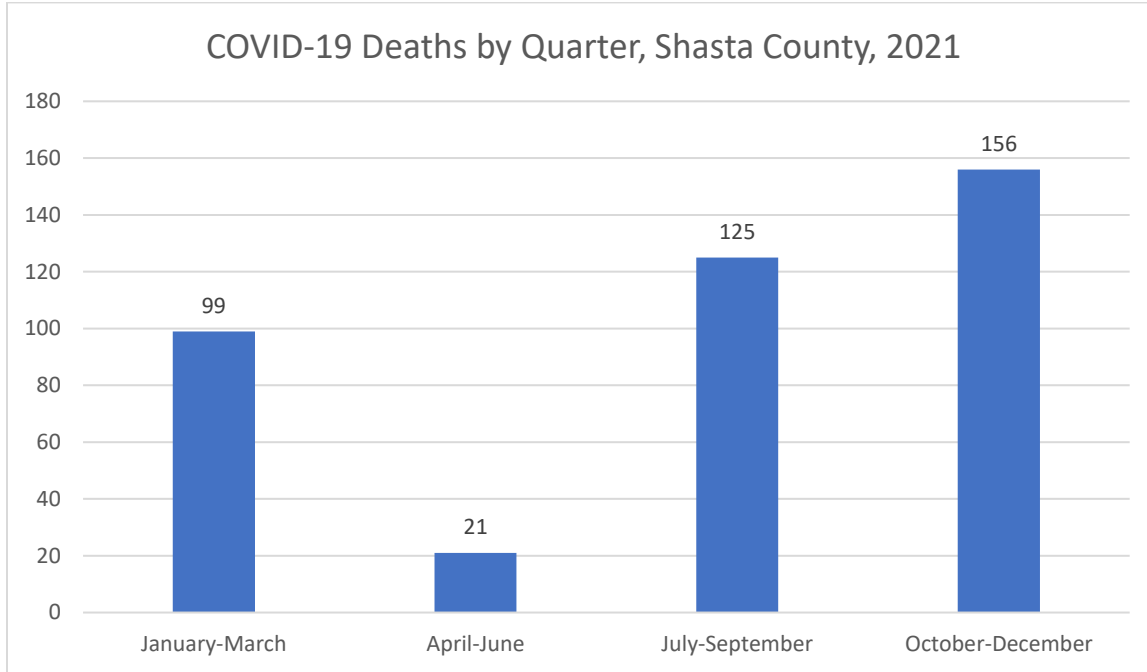
COVID-19 Hospitalizations by Quarter

The largest number of hospitalizations during the pandemic to date occurred from July-September 2021. This timeframe is reflective of Shasta County's wave of the SARS-CoV-2 Delta variant, where cases peaked in September 2021 and slowly declined through mid-December. The wave caused by the Omicron variant began around mid-December 2021.



COVID-19 Deaths by Quarter

The largest number of deaths throughout the pandemic occurred during October-December 2021. This is reflective of Shasta County's wave of the SARS-CoV-2 Delta variant, where cases and hospitalizations peaked in September 2021, and deaths followed during October- December 2021.



By Age Group

COVID-19 Hospitalizations by Age

Most hospitalized patients in Shasta County were between the ages of 50 and 79, with the 60-69 and 70-79 age groups representing the most patients overall (24% in each age group). Adults aged 50-59 accounted for 15% of hospitalizations, and 80-89-year-olds represented 14%. Overall, 57% of hospitalized COVID-19 patients were under the age of 70.

Shasta County seniors aged 90 and older were most likely to be hospitalized as reflected in the hospitalization rates, although this group made up only a small proportion of hospitalizations overall (5%). Compared to 0-39-year-olds, seniors aged 90 and older had a 40.3 times higher risk of being hospitalized. Risk of hospitalization rose with increasing age.

Age Group	Number of Hospitalizations	Percent of Hospitalizations	Age Specific Hospitalization Rate (per 100,000)	Rate Ratio (<40 years as reference group)
0-39	56 [^]	7%	64	(Reference)
40-49	87	11%	469	7.3
50-59	125	15%	596	9.3
60-69	200	24%	850	13.3
70-79	195	24%	1,108	17.3
80-89	116	14%	1,559	24.4
90+	39	5%	2,582	40.3
Total	818	100%	464	N/A

[^]Includes 11 patients aged 0-19 years, 12 patients aged 20-29, and 33 patients aged 30-39. These age brackets are grouped together for data stability to compare rates.

COVID-19 Deaths by Age

The highest number of COVID-19 deaths occurred in the 70-79 age bracket (28% of deaths occurred in this age group). The group with the next highest number of deaths was 80-89-year-olds (22% of deaths). Overall, 64% of deaths were among those aged 70 and older.

Shasta County seniors aged 90 and older were most likely to die from COVID-19 as reflected in the death rates, although this group made up a relatively small proportion of deaths overall (14%). Compared to 20-49-year-olds, seniors aged 90 and older had a 56.3 times higher risk of dying from COVID-19. Risk of death overall rose with increasing age and became extremely high after the age of 80.

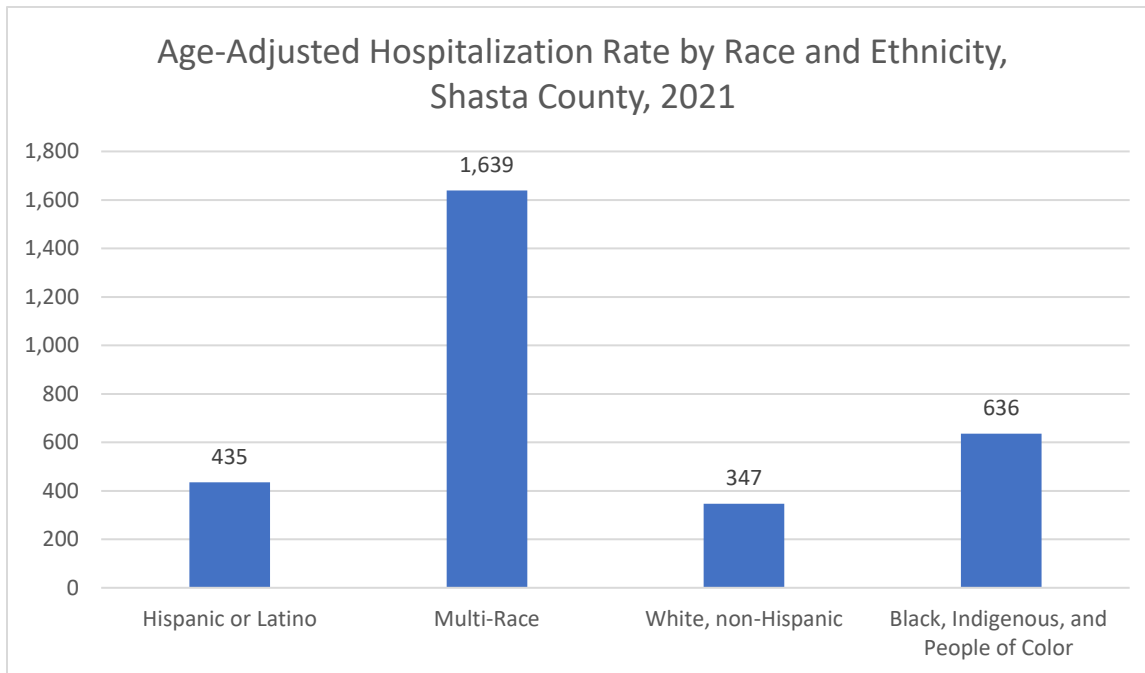
Age Group	Number of Deaths	Percent of Deaths	Death Rate (per 100,000)	Rate Ratio (20-49 as reference group)
0-19	0	0%	N/A	N/A
20-49	28	7%	67	(reference)
50-59	46	11%	219	3.3
60-69	69	17%	293	4.4
70-79	112	28%	636	9.5
80-89	89	22%	1,196	17.9
90+	57	14%	3,775	56.3
Total	401	100%	227	N/A

By Race and Ethnicity

COVID-19 Hospitalizations by Race and Ethnicity

On average, Shasta County’s Black, Indigenous, and People of Color population was significantly more likely to be hospitalized for COVID-19 compared to the white, non-Hispanic population. The risk of hospitalization for Black, Indigenous, and People of Color was 1.8 times higher compared to white non-Hispanics.

Looking at specific race/ethnic groups, multi-racial individuals were hospitalized at a much higher rate than the white non-Hispanic population. Hispanic or Latino individuals were hospitalized at about the same rate as the white non-Hispanic population. Other specific racial groups were not broken out individually for this report due to small numbers.



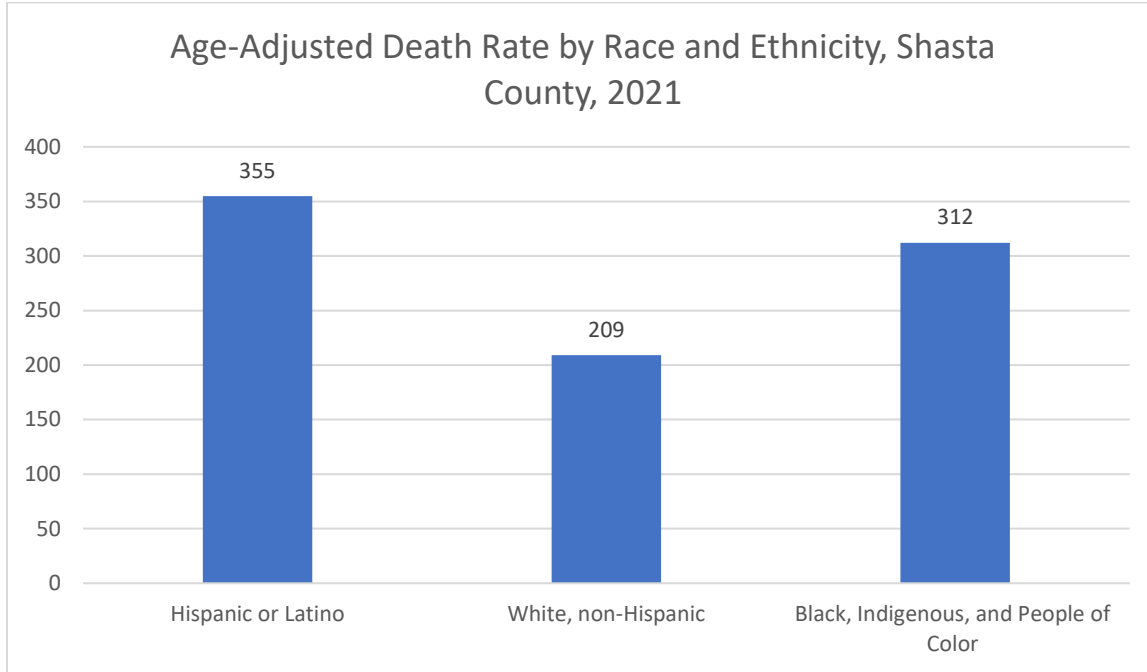
Race/Ethnicity	Hospitalizations (2021)	Age Adjusted Rate (per 100,000)	95% Confidence Interval
Hispanic or Latino (Any Race)	45	435	(308-561)
Multi-Racial (Any Ethnicity)	57	1,639*	(1,213-2,064)
White, Non-Hispanic	530	347	(317-376)
Black, Indigenous, and People of Color	139	636*	(530-742)

Key: *Indicates the Age Adjusted Rate is significantly higher vs. the white, non-Hispanic population.

Note: Totals will not add due to some patients with unidentified race and ethnicity.

COVID-19 Deaths by Race and Ethnicity

On average, Shasta County’s Black, Indigenous, and People of Color population was 1.5 times more likely to die from COVID-19 compared to the white, non-Hispanic population. Hispanic or Latino individuals were 1.7 times more likely to die compared to White, non-Hispanic individuals.



Race/Ethnicity	Deaths (2021)	Age Adjusted Rate (per 100,000)	95% Confidence Interval
Hispanic (Any Race)	32	355*	(232-478)
White, Non-Hispanic	328	209	(186-231)
Black, Indigenous, and People of Color	65	312*	(236-388)

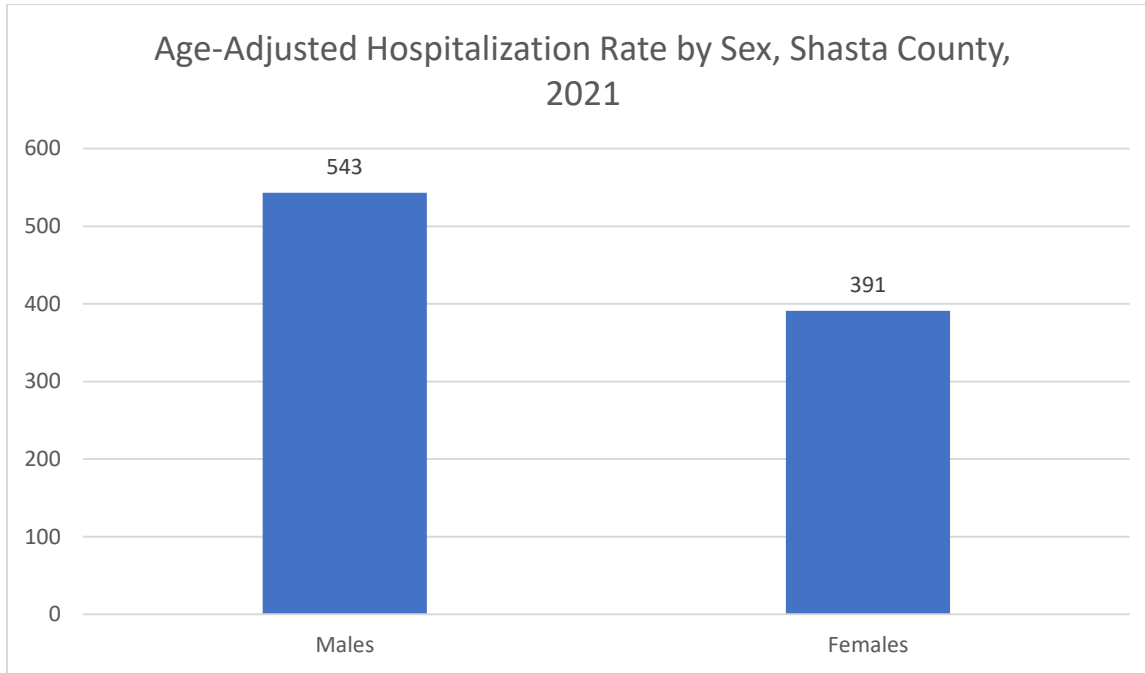
Key: *Indicates the Age Adjusted Rate is significantly higher vs. the white, non-Hispanic population.

Note: Totals will not add due to some patients with unidentified race and ethnicity.

By Sex

COVID-19 Hospitalizations by Sex

Males were 1.4 times more likely to be hospitalized for COVID-19 compared to females.

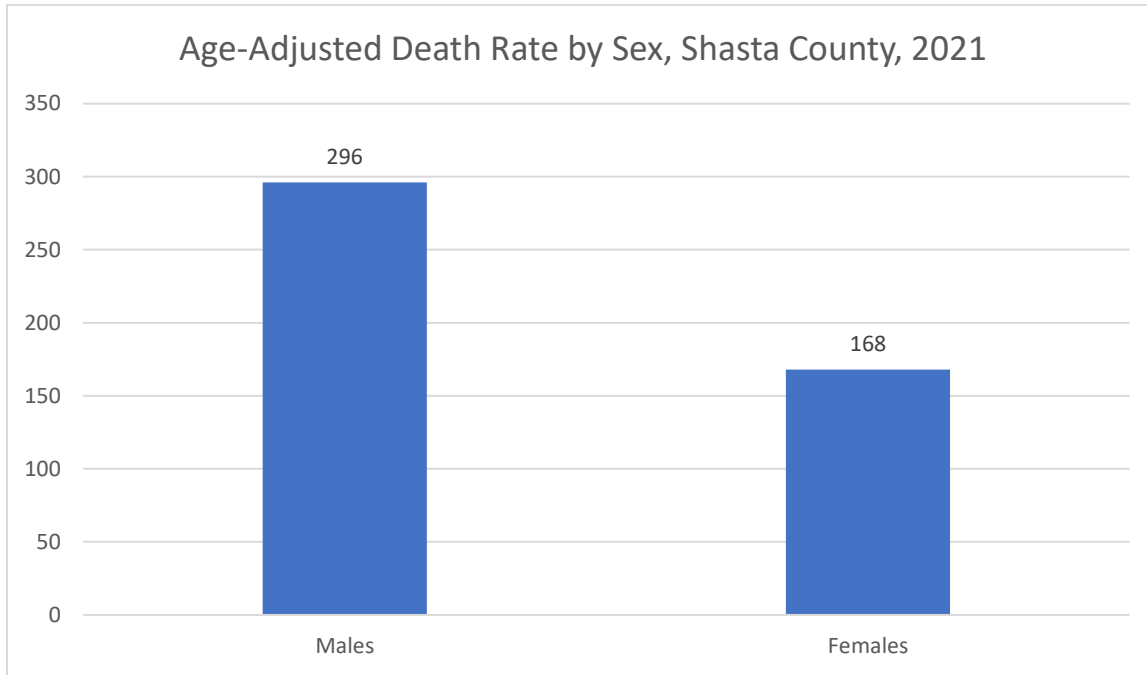


Race/Ethnicity	Hospitalizations (2021)	Age Adjusted Rate (per 100,000)	95% Confidence Interval
Males	446	543*	(493-594)
Females	369	391	(351-430)

Key: *Indicates the Age Adjusted Rate is significantly higher vs. Females. Note: Totals will not add due to some patients with unidentified sex.

COVID-19 Deaths by Sex

Males were 1.8 times more likely to die from COVID-19 compared to females, a statistically significant difference.



Race/Ethnicity	Deaths (2021)	Age Adjusted Rate (per 100,000)	95% Confidence Interval
Males	237	296*	(258-334)
Females	164	168	(143-194)

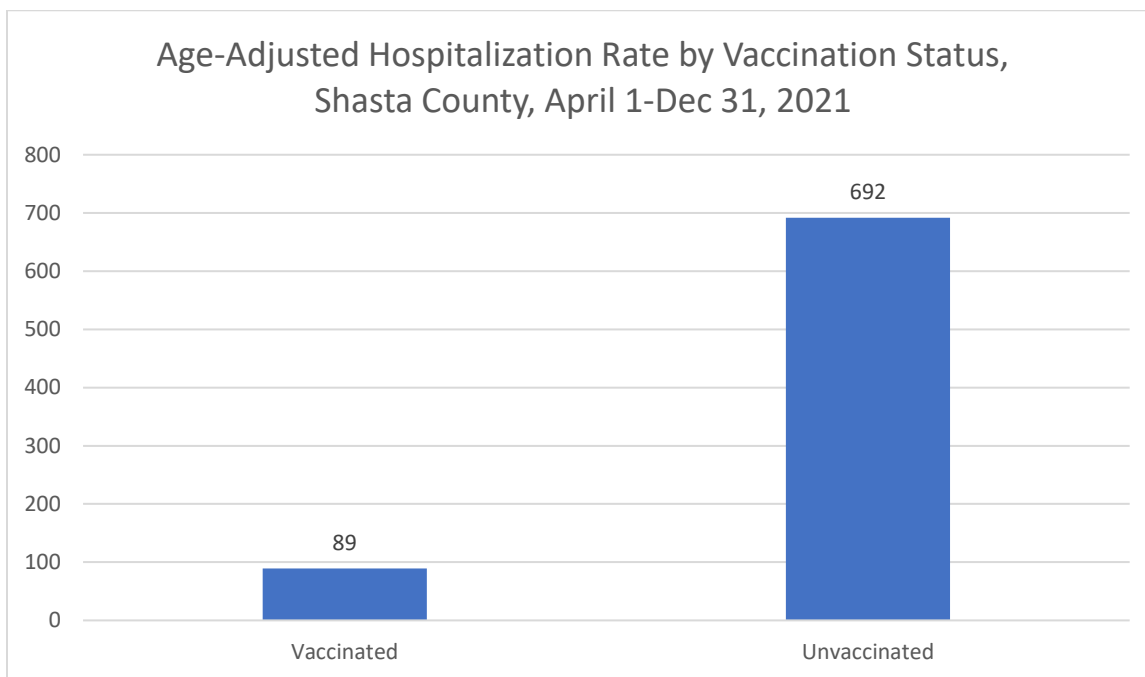
Key: *Indicates the Age Adjusted Rate is significantly higher vs. females. Note: Totals will not add due to some patients with unidentified sex.

By Vaccination Status

Please note that partially vaccinated people and those with unknown vaccination status were excluded from this analysis. The time period for this analysis spans from April 1st to December 31st, 2021. April 1st is the date when vaccination was considered widely available for Shasta County adults. The analysis does not account for additional doses recommended for immunocompromised individuals nor for booster doses, which were recommended by the CDC beginning in August and September 2021, respectively. Data that are available on additional doses and boosters among deceased individuals are noted below.

COVID-19 Hospitalizations by Vaccination Status

These findings show that vaccination was highly effective at preventing hospitalization. Unvaccinated individuals were 7.8 times more likely to be hospitalized for COVID-19 compared to those who were fully vaccinated.

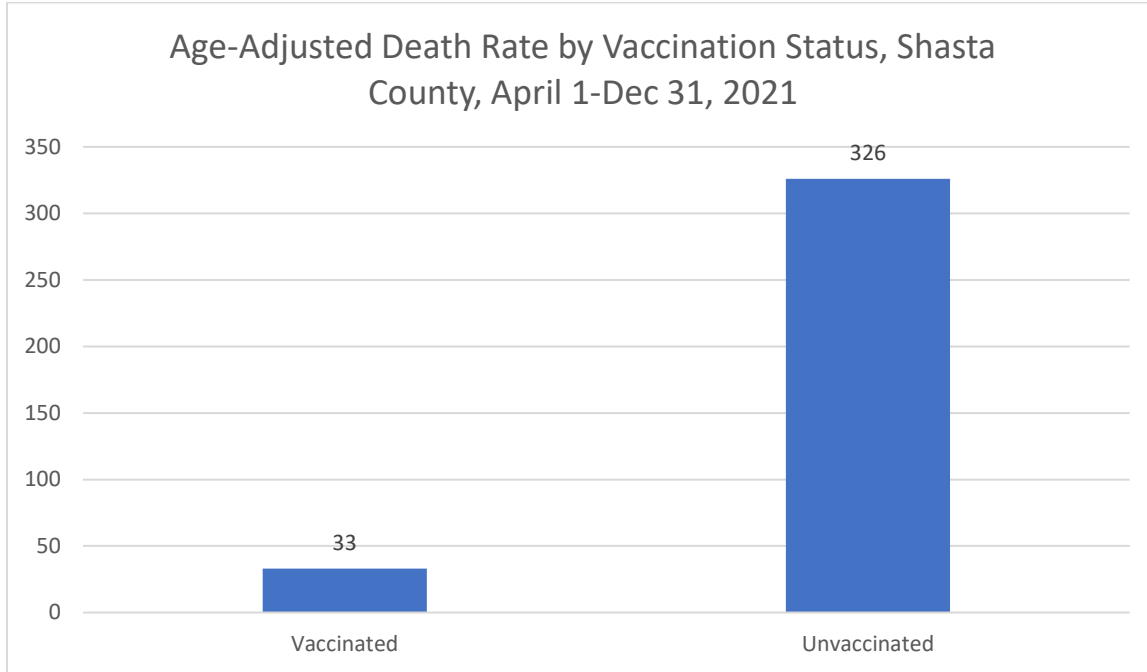


Vaccination Status	Hospitalizations (Apr-Dec 2021)	Age Adjusted Rate (per 100,000)	95% Confidence Interval	Rate Ratio (Vaccinated as Reference Group)
Vaccinated Individuals	83	89	(70-108)	(reference)
Unvaccinated Individuals	595	692*	(637-748)	7.8

Key: *Indicates the Age Adjusted Rate is significantly higher vs. the vaccinated population. Note: Totals will not add due to some patients with unknown or partial vaccination status. This data excludes 23 partially vaccinated patients and 22 patients for whom vaccination status was unknown.

COVID-19 Deaths by Vaccination Status

These findings show that vaccination was highly effective at preventing deaths from COVID-19. Unvaccinated individuals were 9.8 times more likely to die from COVID-19 compared to those who were fully vaccinated.



Vaccination Status	Deaths (Apr-Dec 2021)	Age Adjusted Rate (per 100,000)	95% Confidence Interval	Rate Ratio (Vaccinated as Reference Group)
Vaccinated Individuals	35	33	(22-44)	(reference)
Unvaccinated Individuals	255	326*	(286-367)	9.8

Key: *Indicates the Age-Adjusted Rate is significantly higher vs. the vaccinated population. Note: Totals will not add due to some patients with unknown or partial vaccination status. The vaccinated count includes 14 individuals who met the eligibility criteria for, but had not received, an additional dose or a booster. The data excluded 12 partially vaccinated decedents.

By Comorbid Conditions

Comorbid “Pre-Existing” conditions are common

CDC estimates that 6 in 10 adults in the United States have a chronic disease (these include: heart disease, cancer, chronic lung disease, stroke, Alzheimer’s disease, diabetes, chronic kidney disease, and many more). Additionally, CDC also estimates that 4 in 10 adults in the United States have two or more chronic diseases.

“Pre-existing conditions” are more common than often recognized. Many people in the general population have at least one health condition. If we examine unhealthy weights alone, it is estimated that 32.8% of Shasta County residents can be considered overweight (BMI 25.0-29.9) and another 33.6% can be considered obese (BMI 30.0 and higher). A BMI in the overweight and obese ranges are associated with an increased risk for severe COVID-19 and increased risk for many other chronic health problems, including high blood pressure, high cholesterol, and diabetes, all of which place an individual at increased risk for severe illness from COVID-19.

Among Shasta County confirmed COVID-19 hospitalizations, 83.1% have one or more “pre-existing conditions.” This is not unexpected given the high prevalence of any chronic disease in the general population as well as the increased risk of severe COVID-19 illness that is associated with these conditions.

Source: <https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm>

Comorbid Conditions Among Hospitalized Patients

The table below shows comorbid conditions among Shasta County patients hospitalized for COVID-19. The most common conditions were also common in the general population. The top three were high blood pressure, diabetes, and obesity.

Comorbid (“Pre-Existing”) Condition	Percent of Hospitalized Patients with this Condition [^]	Percent of Shasta County Residents with this Condition
High Blood Pressure	53.1%	37.0% ¹
Diabetes	30.8%	13.9% ²
Obesity	28.9%	33.6% ²
Heart Disease (Cardiovascular)	26.9%	11.4% ²
Chronic Pulmonary Disease (COPD)	17.2%	3.3% ⁵
Chronic Kidney Disease	14.2%	2.8% ³
History of Cancer	11.4%	5.3% ³
Asthma	10.3%	15.0% ²
History of Stroke	6.9%	5.2% ⁴
Immune Compromised	3.6%	N/A
Neurological or Neurodevelopmental Condition	2.0%	N/A
Chronic Liver Disease	1.6%	N/A
One or More of the Conditions Listed above	83.1%	N/A

[^] Percentages do not total to 100% due to some patients having more than one condition.

Sources: ¹ 2014-2018 California Health Interview Survey. ² 2015-2019 California Health Interview Survey. ³ 2019 CDC Behavioral Risk Factor Surveillance System. ⁴ 2011-2012 California Health Interview. ⁵ 2005 California Health Interview Survey.

Comorbid Conditions Among Decedents

The table below shows common comorbid conditions among those who died from COVID-19. The most common were heart disease, chronic kidney disease, metabolic disorders, chronic pulmonary disease, and diabetes.

Comorbid (“Pre-Existing”) Condition	Percent of Cause of Death with this condition (Field 107 & 112 of Death Certificate)*	Percent of Shasta County Residents with this Condition
Other^	43.1%	N/A
Heart Diseases (Cardiovascular)	36.4%	11.4% ²
Chronic Kidney Disease	21.0%	2.8% ³
Metabolic Disorders	13.2%	N/A
Chronic Pulmonary Diseases	13.2%	3.3% ⁵
Diabetes	13.0%	13.9% ²
High Blood Pressure	12.0%	37% ¹
Neurological or Neurodevelopmental Condition	12.0%	N/A
History of Stroke	5.2%	5.2% ⁴
History of Cancer	2.5%	5.3% ³
Asthma	1.8%	15% ²
Obesity	1.4%	33.6% ²

* Percentages do not total to 100% due to some patients having more than one condition.

^Note: “Other” includes a wide range of potentially contributing conditions such as tobacco use, substance overdose, fractures, dehydration, infections, etc.

Sources: ¹2014-2018 California Health Interview Survey. ²2015-2019 California Health Interview Survey. ³2019 CDC Behavioral Risk Factor Surveillance System. ⁴2011-2012 California Health Interview. ⁵2005 California Health Interview Survey. ^Note:

Congregate Setting Facilities

Congregate settings include skilled nursing facilities, assisted living facilities, homeless shelters, board and care residences, jail, and other locked or semi-locked facilities.

COVID-19 Hospitalizations Among Residents of Congregate Setting Facilities

In 2021, 65 residents of congregate settings were hospitalized.

Gender	2021
Male	31
Female	34
Total	65

Approximately 8% of confirmed hospitalization for COVID-19 were among residents of congregate settings.

COVID-19 Deaths Among Residents of Congregate Setting Facilities

In 2021, there were 81 congregate setting residents who died from COVID-19.

Gender	2021
Male	36
Female	45
Total	81

Approximately 20% of confirmed deaths from COVID-19 were among residents of congregate settings.

Leading Causes of Death

COVID-19 Deaths compared to all other causes of death in Shasta County

The preliminary data below shows the leading causes of death in Shasta County. The top three causes of death using CDC standard classification are heart disease, all cancers, and COVID-19.

Source: [CDC Leading Causes of Death](#)

Top 10 Causes of Death 2021[@]	
Cause	Count
Heart disease	501
All Cancers	450
COVID-19	401
TOTAL UNINTENDED INJURIES	159
Chronic Lower Respiratory Disease (CLRD)**	158
Alzheimer's disease	146
Stroke	98
Organic dementia	81
TOTAL INTENDED INJURIES	65
Diabetes	59
Total Deaths in 2021	2,767

[@] based on 2,767 final, cause of death data preliminary subject to change, count of individual causes of death do not add to 2,767 because this table only represents the top 10 causes of death in Shasta County.

** Such as chronic obstructive pulmonary disease, emphysema, chronic bronchitis, pneumonitis and asthma.

Annotated References:

Detailed Sources: Comorbidity: (Source – Topic, years used for estimate)

Hypertension: AskCHIS – Ever diagnosed with high blood pressure (adult), 2014-2018 pooled

Diabetes: AskCHIS – Ever diagnosed with diabetes (adult), 2015-2019 pooled

Cardiac disease: AskCHIS – Ever diagnosed with heart disease (adult), 2015-2019 pooled

Former smoker: AskCHIS – Smoking status- current, former, never (adult), 2015-2019 pooled

COPD: BRFSS – [2019 Chronic health indicators: COPD age-adjusted prevalence](#); see screen shot for additional changes needed to show the same number as above (Change Data Type to age-adjusted prevalence)

Obesity: AskCHIS – Body mass index- 4 level (adult only), 2015-2019 pooled

CKD: BRFSS – [2019 Chronic health indicators: Kidney age-adjusted prevalence](#); see screen shot for additional changes needed to show the same number as above (Change Data Type to age-adjusted prevalence)

Asthma: AskCHIS – Ever diagnosed with asthma (limited to ages 18+), 2015-2019 pooled

Cancer: BRFSS – [2019 Chronic health indicators: Other cancer \(not skin\) age-adjusted prevalence](#); see screen shot for additional changes needed to show the same number as above (Change Data Type to age-adjusted prevalence)

Stroke: AskCHIS – Ever had a stroke, 2011-2012 pooled

Current smoker: AskCHIS – Smoking status- current, former never (adult), 2015-2019 pooled

CLD: AskCHIS – Ever told have lung disease other than asthma, 2005