

# COVID-19 Cases, Hospitalizations, and Deaths by Vaccination Status

Washington State Department of Health

January 18, 2023

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*Washington State Department of*  
*Health*

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## DATA NOTES:

- On April 20, 2022, DOH updated COVID-19 vaccination language, changing the terms “initiating vaccination” and “fully vaccinated” to “initiated primary series” and “completed primary series.” This change in language allows for better differentiation between original vaccine series and boosters.
  - In the coming weeks we will update this report to include information about booster doses and COVID-19 case rates for children 5-11 years old.
  - On June 28, DOH standardized the definition of SARS-CoV-2 vaccination status. The definition of “completed primary series” has been updated to include only second doses of the primary series that were received at the appropriate time interval following the first dose. The *SARS-CoV-2 Vaccine Breakthrough Surveillance and Case Information Resource* and the *COVID-19 Cases, Hospitalizations, and Deaths by Vaccination Status* reports are now aligned to this definition and will be reporting on the same cases.
  - On July 12, 2022, the method used to link COVID-19 case data to COVID-19 vaccination data was updated to include more robust linking methods. As a result of this updated method, more COVID-19 cases who completed the primary series were identified.
  - Beginning August 9, 2022, this report will be updated monthly instead of biweekly.
  - Due to a data security breach encountered by one of Washington's hospital organizations, case, hospitalization, death, and testing data are incomplete in some counties as of October 3, 2022. Please see the COVID-19 Dashboard for more information about the specific impact to data and the anticipated timeline for resolution.
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## Summary

Unvaccinated 12-34 year-olds in Washington are

- 2 times more likely to get COVID-19 compared with 12-34 year-olds who have completed the primary series.
- 3.5 times more likely to be hospitalized with COVID-19 compared with 12-34 year-olds who have completed the primary series.

Unvaccinated 35-64 year-olds are

- 1.8 times more likely to get COVID-19 compared with 35 - 64 year-olds who have completed the primary series.
- 2.6 times more likely to be hospitalized with COVID-19 compared with 35 - 64 year-olds who have completed the primary series.

Unvaccinated 65+ year-olds are

- 2.4 times more likely to get COVID-19 compared with 65+ year-olds who have completed the primary series.
- 3.4 times more likely to be hospitalized with COVID-19 compared with 65+ year-olds who have completed the primary series.
- 4.1 times more likely to die of COVID-19 compared with 65+ year-olds who have completed the primary series.

## Background

Vaccination is a critical tool for containing the COVID-19 pandemic. COVID-19 vaccines are highly effective and greatly reduce the risk of severe illness, hospitalization, and death from COVID-19. Approximately 70% of the eligible Washington population ages 5 and older has completed the primary series and is protected from experiencing these serious outcomes. However, many remain unvaccinated and case rates are currently very high. Vaccination rates also vary across the state and between age and demographic groups, leaving some populations particularly vulnerable.

Although COVID-19 vaccines work well to prevent severe illness and death among those exposed to the virus, a small percentage of people who have completed the primary series will still get COVID-19. Even highly effective vaccines cannot prevent all infections. However, because the vaccine offers strong protection against the most serious outcomes of COVID-19, increasing vaccination rates is key to limiting severe COVID-19 cases and saving lives.

This report provides an overview of confirmed and probable COVID-19 cases, hospitalizations, and deaths by vaccination status. The purpose is to provide a comprehensive look at the impact of vaccination on COVID-19 in Washington state. This report breaks vaccination status into three categories:

- **Completed primary series:** those who have reached 2 weeks after receiving the final recommended dose of the primary series of an authorized COVID-19 vaccine.
- **Partially vaccinated:** those who have received one or more doses of an authorized vaccine but have not reached the full 14 days after the final dose of the primary series.
- **Unvaccinated:** those who have not received any dose of a COVID-19 vaccine.

Individuals are not considered to have completed the primary series until two weeks have passed since receiving their final dose because of the time required for the body to build protection.

The Omicron variant is the dominant COVID-19 strain in Washington and the U.S. More variants are appearing worldwide, so it is more urgent than ever to ensure that everyone who is eligible gets vaccinated against COVID-19. As of January 07, 2023, 9.7% of eligible Washingtonians had not yet initiated the primary series. The percentage of individuals who completed the primary series is now increasing only modestly, rising by less than 1% from December 31- January 07, 2023.

## Trends in COVID-19 case and hospitalization rates by vaccination status and age group

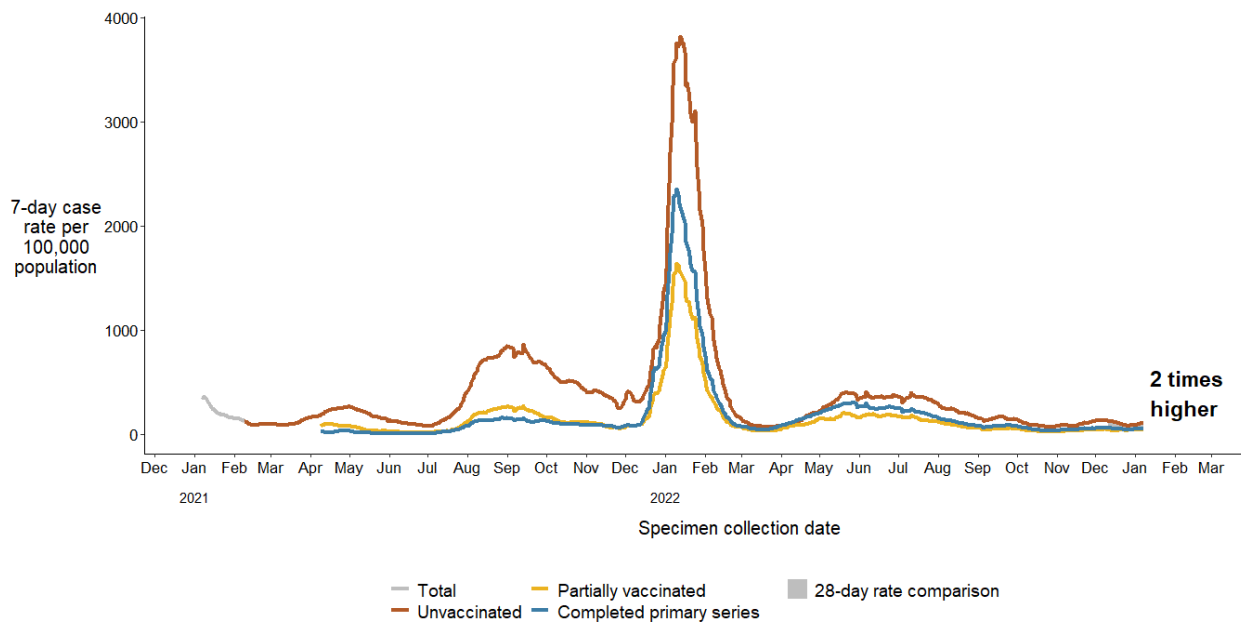
The following graphs show the 7-day COVID-19 case, hospitalization and death rates by age group for people who are unvaccinated, people who are partially vaccinated, and people who have completed the primary series. The difference between rates in the unvaccinated population compared to the population of those who have completed the primary series during the grayed out 28-day time period is shown in text on each graph.

There is a large difference in cases and hospitalizations between the unvaccinated population and the population of those who have completed the primary series across all age groups. This difference has become greater since January of this year. The rapid increase in cases starting in mid-December 2021 is related to the following events:

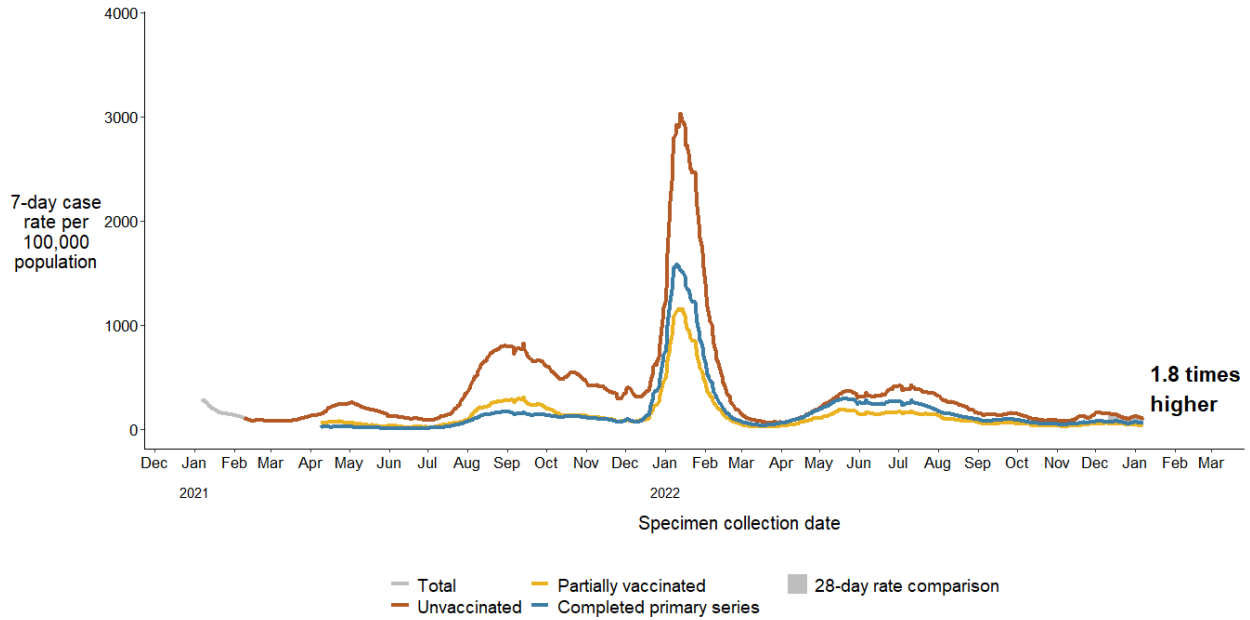
- The Omicron variant became the predominant strain in Washington state
- Gatherings increased in size and number because of holiday celebrations.

### COVID-19 Cases

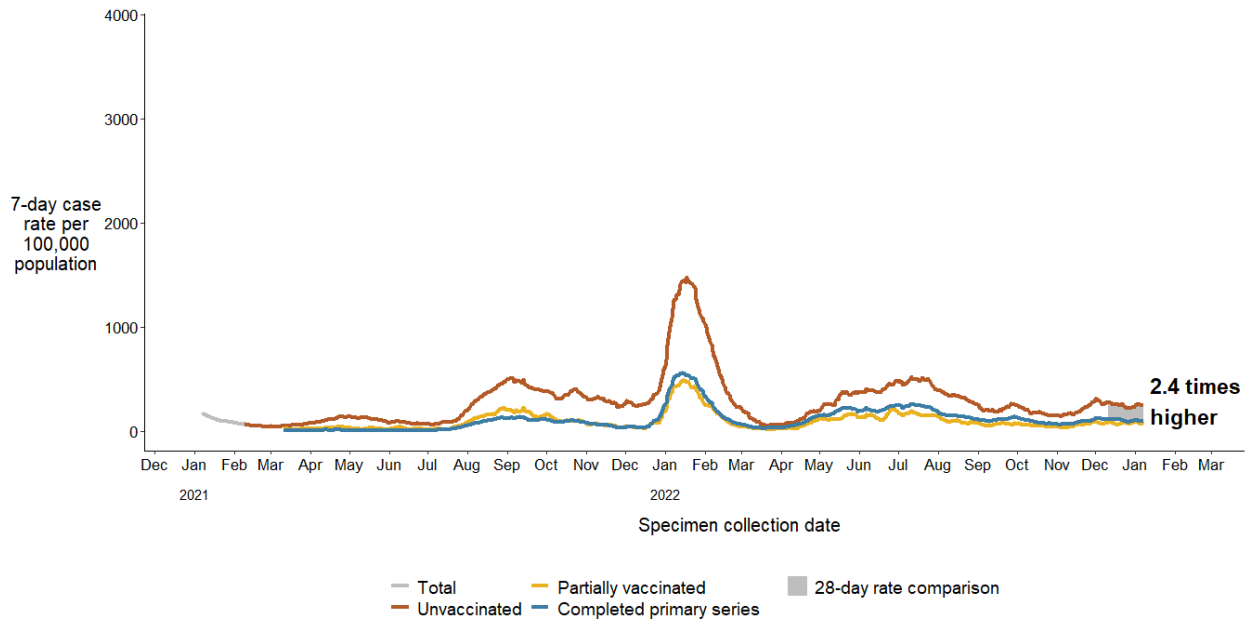
**COVID-19 case rates among 12-34 year-old individuals are 2 times higher in the unvaccinated population than in the population of those who have completed the primary series**



**COVID-19 case rates among 35-64 year-old individuals are 1.8 times higher in the unvaccinated population than in the population of those who have completed the primary series**



**COVID-19 case rates among 65+ year-old individuals are 2.4 times higher in the unvaccinated population than in the population of those who have completed the primary series**



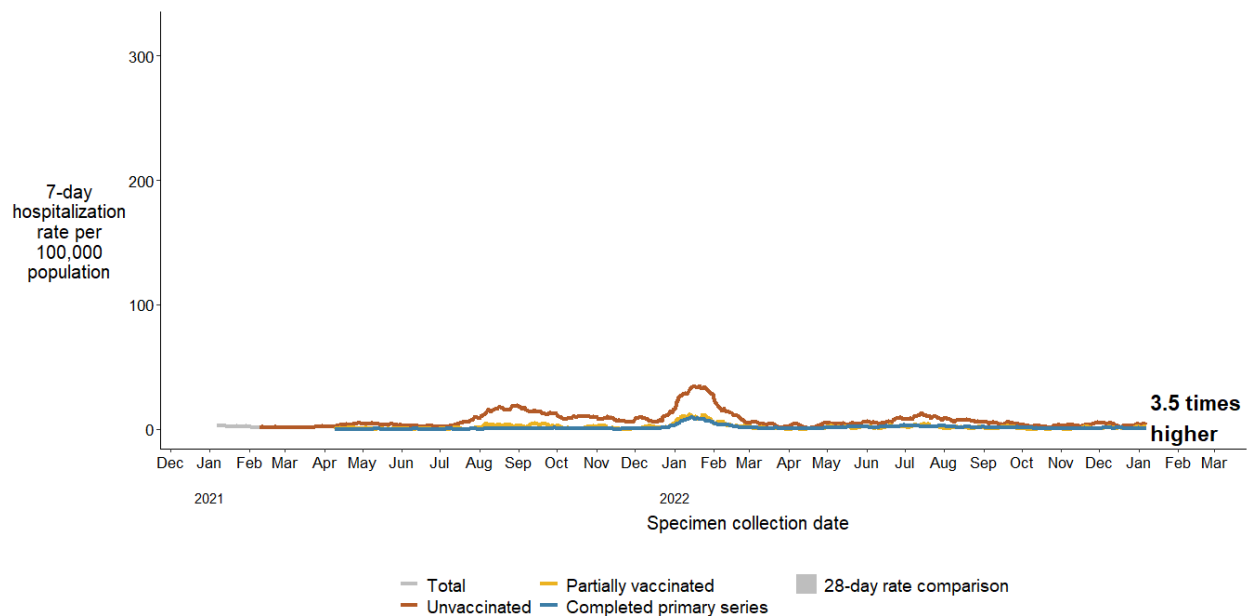
## COVID-19 case rates per 100,000 population from December 11 to January 07, 2023

Age group	Age-specific rate per 100,000 in unvaccinated individuals	Age-specific rate per 100,000 in individuals who completed the primary series	Impact
12-34	399.4	198.0	2 times higher in unvaccinated
35-64	482.4	266.9	1.8 times higher in unvaccinated
65+	977.2	415.0	2.4 times higher in unvaccinated

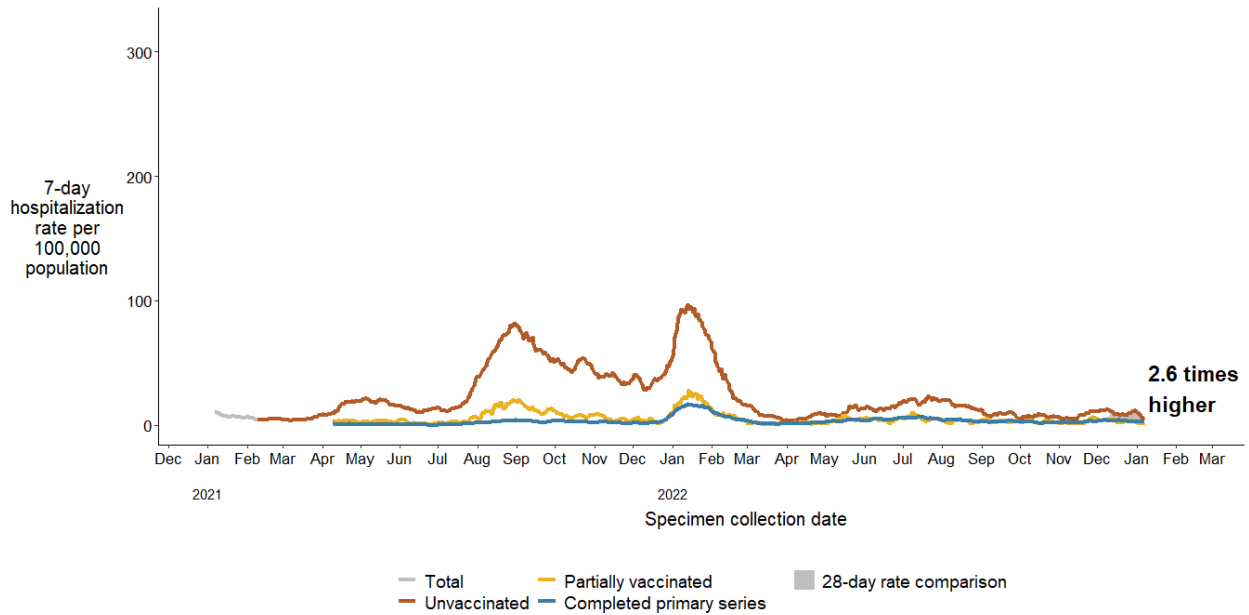
- Case rates are calculated using population data for the specified age group

## COVID-19 Hospitalizations

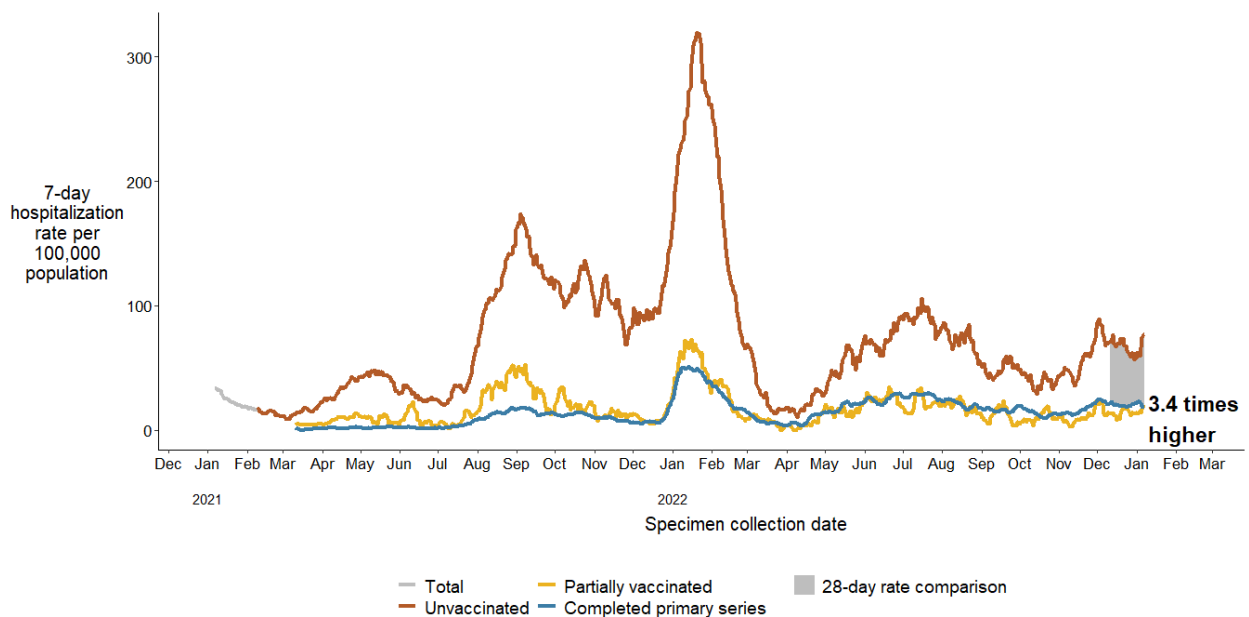
COVID-19 hospitalization rates among 12-34 year-old individuals are 3.5 times higher in the unvaccinated population than in the population of those who have completed the primary series



**COVID-19 hospitalization rates among 35-64 year-old individuals are 2.6 times higher in the unvaccinated population than in the population of those who have completed the primary series**



**COVID-19 hospitalization rates among 65+ year-old individuals are 3.4 times higher in the unvaccinated population than in the population of those who have completed the primary series**





**COVID-19 hospitalization rates per 100,000 population from December 11 to January 07, 2023**

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Age group	Age-specific rate per 100,000 in unvaccinated individuals	Age-specific rate per 100,000 in individuals who completed the primary series	Impact
12-34	13.0	3.7	3.5 times higher in unvaccinated
35-64	35.3	13.5	2.6 times higher in unvaccinated
65+	267.9	79.3	3.4 times higher in unvaccinated

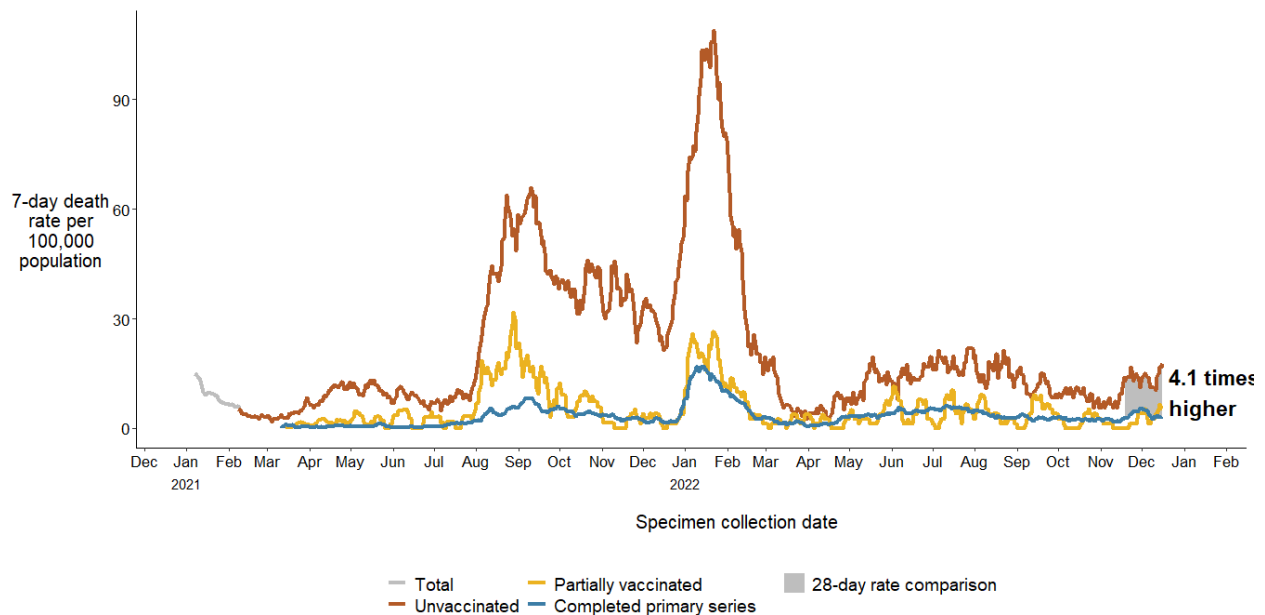
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- Case rates are calculated using population data for the specified age group

## COVID-19 Deaths

Deaths are only shown for Washingtonians 65 years old and older due to the relatively smaller number of deaths in other age groups and associated instability in rates when assessing by vaccination status.

**COVID-19 death rates among 65+ year-old individuals are 4.1 times higher in the unvaccinated population than in the population of those who have completed the primary series**



## COVID-19 death rates per 100,000 population from November 19 to December 16, 2022

Age group	Age-specific rate per 100,000 in unvaccinated individuals	Age-specific rate per 100,000 in individuals who completed the primary series	Impact
65+	84.9	20.5	4.1 times higher in unvaccinated

- Case rates are calculated using population data for the specified age group

## Total number and percentage of COVID-19 cases, hospitalizations, and deaths by vaccination status

### COVID-19 cases from February 01, 2021 - January 07, 2023

Vaccination status	Number of COVID-19 cases (12+)	Percent of all COVID-19 cases (12+)	Percent of population (12+)
Completed primary series	747,607	54.9%	82%
Partially vaccinated	71,266	5.2%	8.3%
Unvaccinated	543,788	39.9%	9.7%

### COVID-19 hospitalizations from February 01, 2021 - January 07, 2023

Vaccination status	Number of COVID-19 hospitalizations (12+)	Percent of all COVID-19 hospitalizations (12+)	Percent of population (12+)
Completed primary series	23,691	40.2%	82%
Partially vaccinated	3,196	5.4%	8.3%
Unvaccinated	32,084	54.4%	9.7%

### COVID-19 deaths from February 01, 2021 - December 16, 2022

Vaccination status	Number of COVID-19 deaths (12+)	Percent of all COVID-19 deaths (12+)	Percent of population (12+)
Completed primary series	3,951	39.4%	82%
Partially vaccinated	551	5.5%	8.3%
Unvaccinated	5,521	55.1%	9.7%

## **COVID-19 cases, hospitalizations, and deaths in unvaccinated individuals and individuals who have completed the primary series by age**

The tables below show cases, hospitalizations, and deaths in unvaccinated individuals and individuals who have completed the primary series through the last complete month of data. The tables highlight the difference between those who do not have any vaccine protection and those with protection from completing the primary series. The population that is partially vaccinated is not represented in these tables.

- The proportion of cases, hospitalizations, and deaths in unvaccinated individuals is lowest among older age groups (65 years and older). This is most likely due to a higher percentage of persons in this age group who have completed the primary series compared with other age groups.
- As the percent of individuals who have completed the primary series in other age groups increases, the percent of cases among those who are unvaccinated is expected to decrease.
- If the exposure to COVID-19 stays the same, as more individuals are vaccinated, more cases, hospitalizations, and deaths will be in vaccinated individuals, as they will continue to make up more and more of the population. For example, if 100% of the population was vaccinated, 100% of cases would be among vaccinated people.
- An increase in the proportion of cases among individuals who completed the primary series will result in a decrease in the proportion of cases among unvaccinated individuals.
- A similar situation will occur as the percent of individuals completing the primary series in other age groups increases.

**COVID-19 cases in unvaccinated individuals and individuals who completed the primary series in Washington state by age group, February, 2021 - December, 2022**

Age group	Number (%) cases in unvaccinated individuals	Number (%) cases in individuals who completed the primary series	Percent of population who are unvaccinated	Percent of population who completed the primary series
12-17	68,988 (54.8%)	51,269 (40.7%)	28.2%	65.4%
18-34	212,574 (45.7%)	225,882 (48.5%)	16.1%	73.3%
35-49	133,960 (37.9%)	200,927 (56.9%)	12.3%	79.9%
50-64	83,642 (33.9%)	151,533 (61.4%)	13.3%	80.2%
65+	44,968 (26.8%)	114,653 (68.4%)	8.4%	85.7%
<b>State total (12+)</b>	<b>544,132 (40%)</b>	<b>744,264 (54.7%)</b>	<b>9.7%</b>	<b>82%</b>

**COVID-19 hospitalizations in unvaccinated individuals and individuals who completed the primary series in Washington state by age group, February, 2021 - December, 2022**

Age group	Number (%) hospitalizations in unvaccinated individuals	Number (%) hospitalizations in individuals who completed the primary series	Percent of population who are unvaccinated	Percent of population who completed the primary series
12-34	5,041 (68.6%)	1,909 (26%)	19.1%	71.4%
35-64	15,056 (64.9%)	6,838 (29.5%)	12.8%	80.1%
65+	11,928 (42.5%)	14,648 (52.2%)	8.4%	85.7%
<b>State total (12+)</b>	<b>32,025 (54.7%)</b>	<b>23,395 (39.9%)</b>	<b>9.7%</b>	<b>82%</b>

**COVID-19 deaths in unvaccinated individuals and individuals who completed the primary series in Washington state by age group, February, 2021 - December, 2022**

Age group	Number (%) deaths in unvaccinated individuals	Number (%) deaths in individuals who completed the primary series	Percent of population who are unvaccinated	Percent of population who completed the primary series
12-64	2,010 (73.8%)	589 (21.6%)	15.6%	76.2%
65+	3,565 (48.1%)	3,418 (46.1%)	8.4%	85.7%
<b>State total (12+)</b>	<b>5,575 (55%)</b>	<b>4,007 (39.5%)</b>	<b>9.7%</b>	<b>82%</b>

(Note: For tables showing hospitalizations by vaccination status and deaths by vaccination status, age groups are collapsed to protect privacy.)

**COVID-19 cases in unvaccinated individuals and individuals who completed the primary series in Washington state by county, February, 2021 - December, 2022**

County	Number (%) cases in unvaccinated individuals	Number (%) cases in individuals who completed the primary series	Percent of population who are unvaccinated (12+)	Percent of population who completed the primary series (12+)
Adams	1,751 (56.6%)	1,194 (38.6%)	10.6%	80.7%
Asotin	2,610 (67.4%)	1,108 (28.6%)	46%	47.3%
Benton	20,697 (51%)	17,807 (43.9%)	24.3%	69.1%
Chelan	6,643 (43.1%)	8,042 (52.2%)	10.8%	81.8%
Clallam	5,436 (42.3%)	6,886 (53.5%)	17.4%	76.4%
Clark	36,653 (45.7%)	39,061 (48.7%)	17%	74.8%
Columbia	318 (56.1%)	222 (39.2%)	45.4%	48.6%
Cowlitz	11,174 (56.1%)	7,759 (38.9%)	23.4%	69.8%
Douglas	3,816 (44.4%)	4,351 (50.7%)	19%	74.8%
Ferry	805 (58.5%)	510 (37.1%)	46.6%	49.6%
Franklin	11,703 (53.8%)	8,922 (41%)	23.4%	68.8%
Garfield	194 (54.5%)	145 (40.7%)	41.6%	45%
Grant	10,633 (54.7%)	7,965 (41%)	22.6%	70.7%
Grays Harbor	7,078 (47.8%)	7,030 (47.5%)	22.3%	71.6%
Island	4,932 (46.9%)	4,958 (47.2%)	19.8%	72.2%
Jefferson	1,246 (31.6%)	2,532 (64.2%)	10.7%	83.4%
King	103,328 (25.9%)	274,534 (68.7%)	<5.0%	94.6%
Kitsap	16,978 (42.3%)	20,903 (52.1%)	20.2%	72.5%
Kittitas	3,623 (51.6%)	3,035 (43.2%)	31.1%	61.9%
Klickitat	2,056 (64.7%)	1,003 (31.6%)	41.9%	53.1%
Lewis	9,248 (60.4%)	5,366 (35.1%)	33.1%	60.7%

County	Number (%) cases in unvaccinated individuals	Number (%) cases in individuals who completed the primary series	Percent of population who are unvaccinated (12+)	Percent of population who completed the primary series (12+)
Lincoln	1,219 (60%)	760 (37.4%)	36.5%	60.8%
Mason	5,662 (47.4%)	5,688 (47.6%)	23.1%	70%
Okanogan	3,754 (52.8%)	3,069 (43.2%)	20.6%	73.1%
Pacific	1,818 (49.9%)	1,638 (45%)	22.6%	69.4%
Pend Oreille	1,376 (65.8%)	640 (30.6%)	49.5%	44.1%
Pierce	84,961 (47.8%)	83,191 (46.8%)	20%	73.3%
San Juan	462 (29.8%)	1,016 (65.5%)	<5.0%	88.1%
Skagit	9,058 (43.7%)	10,623 (51.2%)	14.8%	78.2%
Skamania	801 (60.5%)	471 (35.5%)	52.4%	43.8%
Snohomish	50,401 (34.4%)	89,200 (60.9%)	10.6%	82.8%
Spokane	50,420 (50.1%)	45,168 (44.9%)	24.1%	69.2%
Stevens	4,826 (64.7%)	2,325 (31.1%)	55.2%	40.3%
Thurston	20,791 (43.9%)	23,985 (50.6%)	14.7%	77.6%
Wahkiakum	270 (55%)	198 (40.3%)	37.3%	58.3%
Walla Walla	5,682 (45.5%)	6,172 (49.4%)	20.4%	71.3%
Whatcom	13,231 (36.1%)	21,596 (58.8%)	11.7%	80.6%
Whitman	3,006 (49.1%)	2,751 (45%)	42.4%	48.6%
Yakima	23,941 (49%)	22,071 (45.2%)	14.8%	76.1%
Unknown	1,531 (78%)	369 (18.8%)	NA%	NA%
<b>State total</b>	<b>544,132 (40%)</b>	<b>744,264 (54.7%)</b>	<b>9.7%</b>	<b>82%</b>

\*To protect privacy, counts of less than 10 are not reported. Some additional values that could allow someone to calculate those small numbers are also not reported.



## Methods

### Data sources

There are three data sources for these metrics:

- Washington Disease Reporting System (WDRS)
- Washington Immunization Information System (WAIS)
- Washington Health and Life Events System (WHALES)

WDRS receives case, hospitalization, and death information for all COVID-19 cases reported to the Washington State Department of Health in Washington residents. WAIS collects COVID-19 vaccination data from healthcare providers for people vaccinated in Washington. Not all federal correction facilities and federal healthcare organizations (e.g., Department of Defense and Veterans Administration facilities) submit data to WAIS. WAIS may not include vaccination data from all tribal health facilities.

All rates presented in this report are calculated using the Washington state population distribution based on the Office of Financial Management's (OFM) April 1, 2020 population estimates. Calculations include only the 12 and older population.

### Definitions

All case, hospitalization, and death data reported are based on positive molecular or antigen test results. A COVID-19 case who completed the primary series is a person with a positive molecular or antigen test result and a specimen collection date two or more weeks after receiving the final dose of an authorized COVID-19 vaccine. An individual is considered to have completed the primary series two weeks after their second dose in an age-appropriate two-dose series, such as the Pfizer, Moderna, or Novavax vaccines, or two weeks after an age-appropriate single-dose vaccine, such as Johnson & Johnson's Janssen vaccine.

A COVID-19 hospitalization is a Washington resident who has been identified using case investigation data in WDRS or links with Rapid Health Information Network (RHINO) records as hospitalized with confirmed or probable COVID-19.

Deaths are reported to the state by health care providers, medical examiners or coroners, local health departments, or others to the official vital records database, WHALES. COVID-19 deaths included in this report are identified in WHALES where the cause of death was confirmed or suspected to have been COVID-19.

### Timeframes

The first COVID-19 vaccines were administered in Washington in mid-December 2020. Full protection from the vaccine in those vaccinated early would occur about the first week in February. Therefore, we are reporting cases, deaths, and hospitalizations beginning with the month of February 2021.

It takes up to 10 days from specimen collection date for DOH to receive 90% of reported cases, 10 days for DOH to identify hospitalizations, and 32 days to identify deaths. For this reason, we report time periods differently for cases, hospitalizations, and deaths to ensure we have the most complete data.

## Linking methods

All information on COVID-19 cases, hospitalizations, and deaths in this report use WDRS data linked to WAIS COVID-19 vaccination data. The method to link data was updated in July 2022 to include more robust linking methods, resulting in identifying an increased number of cases who completed the primary series. The links are based on a comparison of the following demographic information present in both WDRS and WAIS:

- first name
- last name
- middle initial
- date of birth
- sex at birth
- phone number
- zip code

The new methodology identifies matches even when there are slight variations in the spelling of names or small errors in other demographic information between the two data sources. This method is a more robust method of linking data than the previous method, which required exact matches of first name, last name, and date of birth for records to be considered a match. Missing or incorrect information may lead to some vaccinated persons being incorrectly classified as unvaccinated. COVID-19 cases with vaccines not reported to WAIS as described above are considered unvaccinated in this report.

## 7-day rate calculations

Rates are calculated as the total number of cases or hospitalizations within the specified vaccination and age group with a specimen collection date during the 7-day period divided by the population that falls in the same age group with the same vaccination status at the beginning of the 7-day period.

For example,

7-day completed primary series COVID-19 case rates per 100,000 population among 12-34 year-old individuals on August 7, 2021 =

$$\frac{\text{Cases in 12-34 year-old individuals who completed the primary series with a specimen collection date August 1 - 7}}{\text{Number of 12-34 year-old individuals who completed the primary series in Washington as of August 1}} \times 100,000$$

To compare rates in the population of individuals who completed the primary series to the unvaccinated population, the rates for the most recent four-week (i.e., 28-day) period is calculated. The 28-day rate in the unvaccinated population is divided by the four-week rate in the population of individuals who completed the primary series to calculate a rate ratio. 28-day rates are used for this comparison to provide more stability in the comparison than if 7-day rates were used.

For example,

The rate ratio for those who completed the primary series and unvaccinated COVID-19 case rates per 100,000 population among 12-34 year-old individuals on August 7, 2021 =

28-day (July 11-August 7) case rate for unvaccinated 12-34 year-old individuals

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28-day (July 11-August 7) case rate for 12-34 year-old individuals who completed the primary series

- The population of **who completed the primary series** is defined as the number of individuals who are determined to have completed the primary series in Washington state in the specified age group at the start of the time period.
- The **partially vaccinated** population is defined as the number of partially vaccinated individuals in Washington state in the specified age group at the start of the time period.
- The **unvaccinated** population is defined by subtracting the number of individuals who completed the primary series and partially vaccinated individuals for the specified age group and time period from the entire Washington state population 12 years and older.