

SARS-CoV-2 Vaccine Breakthrough Surveillance and Case Information Resource

Washington State Department of Health

October 20, 2021



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Health

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COVID-19 vaccines are effective and critical tools to aid in the control of this pandemic. Large-scale clinical studies found that COVID-19 vaccines prevented most people from getting COVID-19 illness, but like most other vaccines, they are not 100 percent effective. This means some fully vaccinated people will still get infected with SARS-CoV-2. These individuals may or may not develop COVID-19 symptoms.

Vaccine breakthrough occurs when someone gets infected with an organism they are fully vaccinated against. For the COVID-19 vaccine, this means someone tests positive for SARS-CoV-2 two weeks or more after receiving the full series of an authorized COVID-19 vaccine. Since millions of people in the United States are getting vaccinated, we expect to see some breakthrough disease. Fortunately, there is evidence from research studies that the COVID-19 vaccine reduces the risk of people getting really sick and needing to go to the hospital or dying from COVID-19.

The Washington State Department of Health (DOH) is closely monitoring and investigating vaccine breakthrough cases in Washington to identify possible patterns of infection and disease in our population. The data in this report may change as we get additional information.

New methodology used to identify vaccine breakthrough cases

A new method will be used to help identify vaccine breakthrough cases beginning with the September 1, 2021 issue of the SARS-CoV-2 Vaccine Breakthrough Surveillance and Case Information Resource report. This methodology identifies cases by matching Immunization Information Systems (IIS) data with new positive COVID tests to identify confirmed breakthrough cases. The criteria for a vaccine breakthrough case has not changed.

This method automatically verifies each case's vaccine doses and assures that at least 14 days has passed between the final vaccine administration date and the specimen collection date for the individual's positive test.

Previously, data was only obtained using reports from local public health and other interviewers who talked to people who had a positive PCR or antigen COVID-19 test and learned that the interviewee had been vaccinated. Both methods will be used to identify vaccine cases moving forward.

DOH has continued to review and incorporate methodologies on an ongoing basis to enhance its COVID-19 related data including for breakthrough surveillance. The goal of augmenting the methodology using IIS data is to ensure a more accurate account of the number of breakthrough cases in our state. This method is expected to identify up to 70% more cases than the previous method. While this change in methodology has increased the number of breakthrough cases identified, it is important to remember that vaccines remain critical in providing protection against COVID-19 especially against severe illness and hospitalization.

Note: The combination of a rise in COVID-19 cases, some of which were breakthrough cases, and the large number of additional cases identified by the new methodology resulted in an increase in the number of breakthrough cases.

At a Glance (data from January 17, 2021 - October 09, 2021)

- 55,518 SARS-CoV-2 vaccine breakthrough cases have been identified in Washington State.
- Of the cases that have data available (approximately 50%):
 - 89% reported symptoms
 - 9% were hospitalized
- 527 people died of COVID-related illness

Criteria for SARS-CoV-2 vaccine breakthrough cases

The criteria for identifying vaccine breakthrough cases include a positive lab test (either a PCR test or an antigen test) at least 14 days after a person received their last recommended dose of an authorized COVID-19 vaccine.

We wait 14 days because some people could get COVID-19 soon after vaccination when their body hasn't had enough time yet to build full protection. These infections are not considered vaccine breakthrough cases because they could have been exposed before they were vaccinated. It typically takes about two weeks after the final dose of vaccine for the body to build a high level of protection against the disease.

The new methodology we are using identifies cases by matching Immunization Information Systems (IIS) data with new positive COVID tests to detect confirmed breakthrough cases. We will continue to also identify potential vaccine breakthrough cases through interviews with people who had a positive PCR or antigen COVID-19 test, where investigators ask if the interviewee was vaccinated.

The first COVID-19 vaccines were administered in Washington in mid-December 2020, so we started our surveillance for people who meet these case criteria during the week that began on Sunday, January 17, 2021.

From January 17 - October 09, 2021:

- 55,518 reports of possible breakthrough met the breakthrough case criteria

Note: The Washington State Department of Health continually receives and investigates reports of potential breakthrough cases. Therefore, the data in this report are subject to change as we obtain additional information on SARS-CoV-2 vaccine breakthrough cases.

Washington State SARS-CoV-2 breakthrough cases by age group

January 17, 2021 - October 09, 2021

Age group (years)	Number of cases	Percent of cases
≤ 19	2,763	5%
20-34	13,754	25%
35-49	14,862	27%
50-64	12,874	23%
65-79	8,493	15%
80+	2,771	5%
Unknown	1	0%
Total	55,518	100%

- Initially, most reported breakthrough cases occurred in adults 65 years of age and older, who were prioritized for vaccination. As younger age groups became eligible for vaccines, the distribution of breakthrough cases also changed to include younger age groups.

Washington State SARS-CoV-2 breakthrough cases by sex

January 17, 2021 - October 09, 2021

Sex	Number of cases	Percent of cases
Female	30,201	54%
Male	24,166	44%
Unknown	1,151	2%
Total	55,518	100%

- A higher percentage of women in Washington State have chosen to get vaccinated than have men; therefore, more women are at risk for vaccine breakthrough than men. This difference is reflected in the table above.

Washington State SARS-CoV-2 breakthrough cases by race/ethnicity

For all race and ethnicity reporting, all those who indicated Hispanic ethnicity are grouped in the Hispanic ethnicity, regardless of race. Racial groups are identified only for those who indicated non-Hispanic ethnicity. Based on this classification, our report includes the following groups:

- Hispanic; and
- non-Hispanic race categorizations for white, Black, Native Hawaiian and Pacific Islander, Asian, and American Indian/Alaska Native.

The multiracial group includes people who chose more than one category. This can include a selection of unknown and one other race category. This method of categorization allows us to assess the data by race and ethnicity. However, the reporting categories are incomplete and do not reflect the diversity of people and experiences across Washington state.

January 17, 2021 - October 09, 2021

Race and Ethnicity	Number of cases	Percent of cases
American Indian or Alaska Native*	376	1%
Asian*	1,869	7%
Black*	839	3%
Hispanic	3,313	13%
Multiracial*	816	3%
Native Hawaiian or Other Pacific Islander*	220	1%
Other Race*	306	1%
White*	18,249	70%

* Non-Hispanic

- Among 55,518 COVID-19 breakthrough cases, no race and/or ethnicity information was available for 29,530 (53%) people. The lack of data limits our ability to draw firm conclusions about the results provided in the table above.

Washington State SARS-CoV-2 breakthrough cases by symptoms and hospitalization

January 17, 2021 - October 09, 2021

	Symptomatic		Hospitalizations	
	Number of cases	Percent of cases	Number of cases	Percent of cases
Yes	24,504	89%	2,317	9%
No	3,071	11%	24,207	91%

- Most reported breakthrough cases in Washington who had data about symptoms available reported having symptoms.

Note: Among 55,518 COVID-19 breakthrough cases, no symptom information was available for 27,943 (50%), and no hospitalization information was available for 28,994 (52%) persons.

COVID-19 deaths among SARS-CoV-2 breakthrough cases in Washington State

January 17, 2021 - October 09, 2021

Among breakthrough cases from this surveillance period **527** have died of COVID-related illness.

- The age range of deceased cases was 34 - 103 years (median 80 years).
- Among the **527** deceased:
 - **335** people were known to have one or more underlying conditions. Information was not available for **188** of the people who died.
 - **373** people were hospitalized, and **89** were not. Information was not available for **65** of the people who died.
 - **196** were known to be associated with a long-term care facility. The remaining **331** people were either not associated with a long-term care facility or information was not available regarding facilities.

Washington State SARS-CoV-2 vaccine breakthrough cases - variants

Vaccine breakthrough cases were prioritized for whole genome sequencing from January 17, 2021 through September 9, 2021 to ensure that the distribution of variants detected among breakthrough cases could be continually monitored. Beginning September 10, 2021, sequencing for breakthrough cases is now part of random sampling by sentinel surveillance laboratories across the state.

Please refer to the [SARS-CoV-2 Sequencing and Variants in Washington State](#) report for more details.

About this SARS-CoV-2 Vaccine Breakthrough Report

This report does not include information about:

- **Geography:** We want to protect individuals' privacy. Due to the small number of cases in some areas, it would be too easy to identify people with vaccine breakthrough.
- **Vaccine brand:** Vaccine breakthrough has been associated with all three current authorized vaccines. It is misleading to look at breakthrough cases by vaccine brand since we have received and administered more of some brands than others. Additionally, each vaccine has a different dosing schedule so some people reach their 14th day after vaccination more quickly than others. These factors make it difficult to directly compare numbers of breakthrough cases among vaccine brands.