

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Weekly Vaccine Breakthrough Case Report – March 24, 2022

Background

Weekly breakthrough case reports include data through the most recent Sunday and are published on Thursday.¹ Vaccine breakthrough cases are defined as instances in which an individual tests positive for COVID-19 at least 14 days following the completion of any primary COVID-19 vaccine series.² Vaccine breakthrough cases that result in hospitalization or death are reported to Centers for Disease Control and Prevention (CDC).

This report includes only those vaccine breakthrough cases that are reported to public health following a positive test result. People who have tested positive through at-home tests are not included in this report. Reported cases are automatically matched with our statewide immunization database to verify COVID-19 vaccination status.³

Many vaccine breakthrough cases are believed to experience no symptoms or minimal symptoms and, therefore, are unlikely to undergo testing for COVID-19 and be reported to public health.⁴ For this reason, the true number of vaccine breakthrough cases is unknown. The number of reported vaccine breakthrough cases must be interpreted within the context of the more than 2.8 million people in Oregon who have completed a primary COVID-19 vaccine series and the more than 1.5 million who have received a booster dose.

¹ The weekly summary, Figure 1, and Figure 2 use the date that cases are reported to OHA, to provide information on the most recently identified cases. All other dates in this report use specimen collection date to align with the breakthrough case definition.

² This definition is consistent with the CDC's definition, available here: <https://www.cdc.gov/vaccines/covid-19/downloads/COVID-vaccine-breakthrough-case-investigations-Protocol.pdf>.

³ As case counts increased dramatically during the Omicron surge, our database was unable to match the entire volume of reported cases. Oregon Health Authority (OHA) is working towards alternative methods to identify vaccination status for all reported cases in a timely manner regardless of case volume.

⁴ Bergwerk, M., Gonen, T., Lustig, Y., Amit, S., Lipsitch, M., Cohen, C., Mandelboim, M., Gal Levin, E., Rubin, C., Indenbaum, V. and Tal, I., 2021. Covid-19 breakthrough infections in vaccinated health care workers. *New England Journal of Medicine*.

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COVID-19 cases by vaccination status

Weekly summary

During the week of March 13–March 19, there were 1,990 cases of COVID-19 reported to OHA. Of these, 1,232 (61.9%) were unvaccinated, 750 (37.7%) were vaccine breakthrough cases, and 8 (0.4%) had an unknown vaccination status. Of all vaccine breakthrough cases, 395 (52.7%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 55 years. There were 10 (1.3%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 217 (28.9%) cases in persons 65 or older. There were 31 (4.1%) cases aged 12-17.

OHA publishes the most up-to-date information available about cases from the most recently completed MMWR week. However, not all information about a case's vaccination status may be available at the time of publication. Table 1 includes updated totals of COVID-19 cases by vaccine breakthrough status for the previous six weeks.

Table 1. COVID-19 cases by vaccine breakthrough status over the previous 6 weeks

MMWR week ending	Total cases	Cases with known vaccination status	Percent of cases with known vaccination status	Breakthrough cases	Percent breakthrough cases
2022-02-12	18,054	18,013	99.8	8,830	49.0
2022-02-19	9,871	9,854	99.8	4,649	47.2
2022-02-26	5,575	5,567	99.9	2,643	47.5
2022-03-05	4,097	4,095	100.0	1,780	43.5
2022-03-12	2,527	2,525	99.9	1,044	41.3
2022-03-19	1,990	1,982	99.6	750	37.8

Cumulative summary

Overall, 196,477 vaccine breakthrough cases have been identified in Oregon. Of all these, 45,849 (23.3%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5-108). There were 2,692 (1.4%) breakthrough cases

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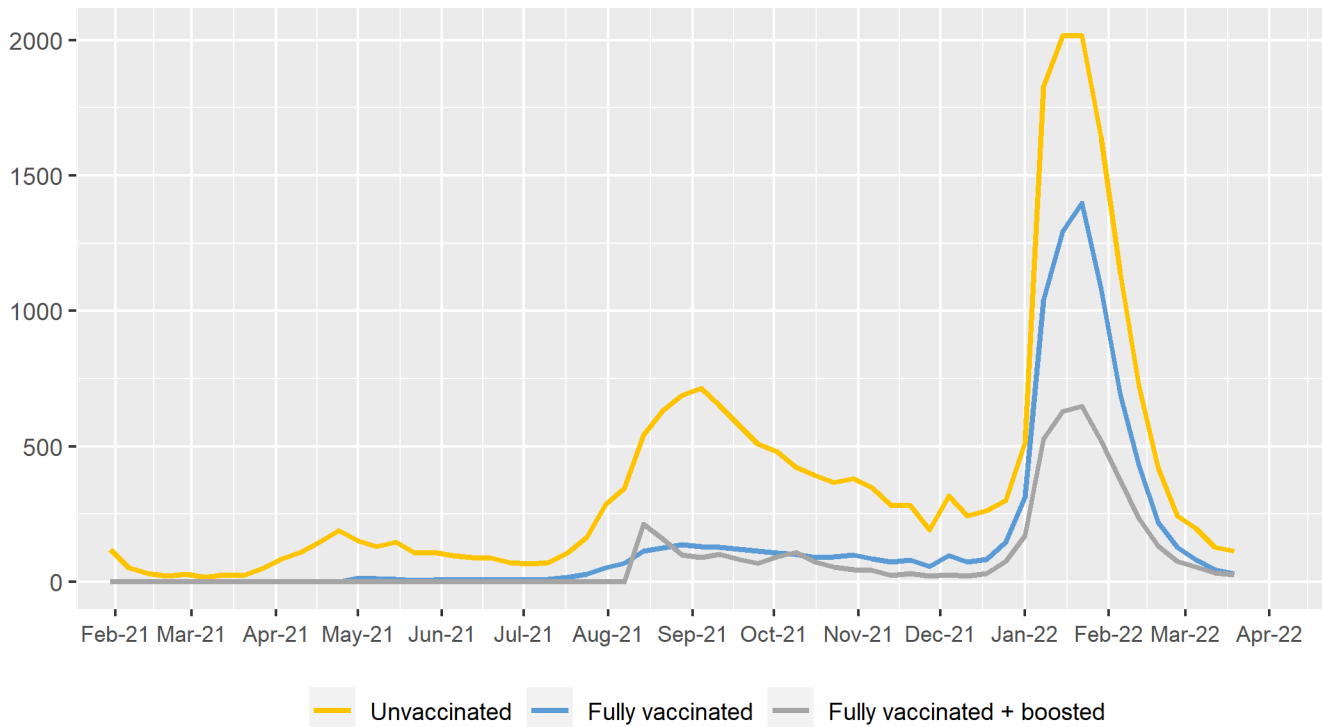
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among residents of care facilities, senior living communities or other congregate living settings. 30,516 (15.5%) cases were 65 or older. There have been a total of 13,129 (6.7%) cases aged 12-17.

The incidence of COVID-19 is much higher in unvaccinated⁵ individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in the most recent week was approximately 3.7 times the rate among those who were fully vaccinated and 4.3 times that among those who were fully vaccinated and boosted. COVID-19 continues to be transmitted throughout Oregon. Vaccination, including boosting, remains the most effective tool to reduce the spread of COVID-19.

Figure 1. Incident COVID-19 cases per 100,000 per week in adults, by vaccination status⁶



⁵ Unvaccinated persons are defined as people who have not received an approved COVID-19 vaccine, or who have not completed a COVID-19 vaccine series.

⁶ Cases with unknown vaccination status were excluded from this figure.

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Vaccine breakthrough cases and severity

The Pfizer, Moderna and Johnson & Johnson COVID-19 vaccines are all highly effective at preventing severe COVID-19 illness and death. Table 2 includes totals of breakthrough cases by vaccine manufacturer and severity. Relatively few breakthrough cases have been hospitalized, and even fewer have died (Figure 2).⁷

Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity⁸

Primary series vaccine manufacturer	Primary series completed	Cases	Hospitalizations	Deaths	Cases per 100,000 vaccinated
Pfizer	1,664,133	116,361	2,524	596	6,992.3
Moderna	971,517	60,895	1,719	362	6,268.0
Johnson & Johnson/Janssen	244,770	19,183	749	162	7,837.2

⁷ A death is considered to be related to COVID-19 in any of the following circumstances: a) death of a confirmed or probable COVID-19 case within 60 days of the earliest available date among exposure to a confirmed case, onset of symptoms, or date of specimen collection for the first positive test; b) death from any cause in a hospitalized person during admission or in the 60 days following discharge AND a COVID-19-positive laboratory diagnostic test at any time since 14 days prior to hospitalization; or c) death of someone with a COVID-19-specific ICD-10 code listed as a primary or contributing cause of death on a death certificate, regardless of the dates of diagnosis or death.

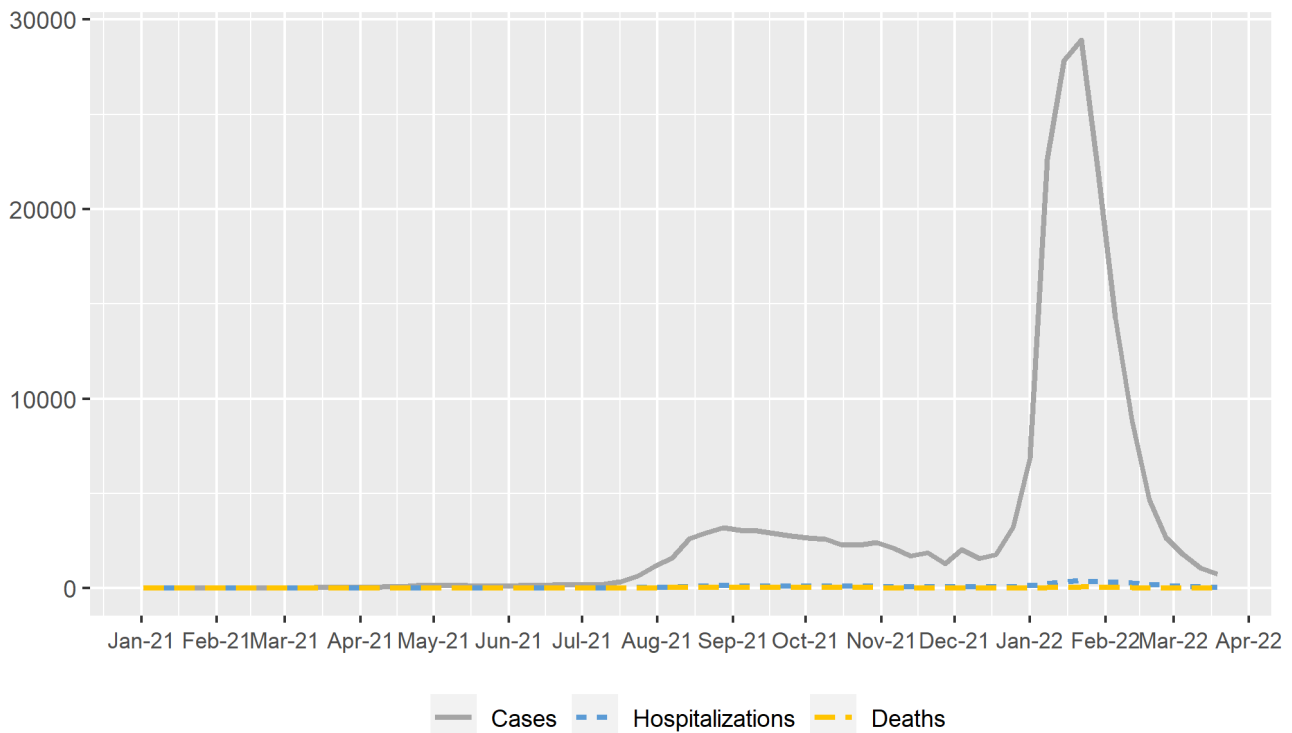
⁸ Table 2 provides the number of cases per 100,000 vaccinated individuals by primary series vaccine manufacturer. Because this figure does not account for the time that each person has been fully vaccinated, it is not a true rate and should not be interpreted as such.

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Figure 2. COVID-19 breakthrough cases, hospitalizations and deaths, by week



Individuals who are fully vaccinated and boosted have the lowest risk of severe illness and death.⁹ Table 3 shows the total number of cases, hospitalizations, and deaths by vaccination status. An individual is considered fully vaccinated and boosted if they received an additional dose of any COVID-19 vaccine at least 5 months after completing a Pfizer or Moderna primary series or at least 2 months after completing a Johnson & Johnson initial dose. If a person has completed a primary series but has not received a valid booster at the time of infection, the individual is categorized as fully vaccinated.

⁹ <https://covid.cdc.gov/covid-data-tracker/#covidnet-hospitalizations-vaccination>.

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Table 3. COVID-19 breakthrough cases in adults, by vaccination status and severity since January 2021¹⁰

Case type	Cases	Hospitalizations	Deaths
Fully vaccinated + boosted	44,959	842	127
Fully vaccinated	138,126	4,113	993
Unvaccinated	258,664	14,516	3,646

To date, 2.5% of all known breakthrough cases have been hospitalized (n=4,997), and only 0.6% have died (n=1120).¹¹ The median age of the people who have died is 80 (range: 23-104). It is important to note that not all vaccine breakthrough cases are reported to public health, which may cause the proportions in the following section to appear higher than in reality. These figures are not vaccine breakthrough hospitalization or death rates and should not be interpreted as such.

Tables 4, 5 and 6 provide detailed vaccine breakthrough severity data by age, race and ethnicity. The risk of both hospitalization and death increases with age.

¹⁰ Cases with unknown vaccination status are excluded from this table. This table also excludes unvaccinated cases prior to January 1, 2021. Based on vaccine rollout in Oregon, this approximates the first date that a breakthrough case could have occurred.

¹¹ Cumulative deaths reported here reflect all breakthrough cases known to have died since January 1, 2021. There may be a lag of several weeks between when an individual dies and when their death appears in this report. Increases in cumulative deaths between this and subsequent reports should not be interpreted as individuals who have died within the past week.

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Table 4. COVID-19 breakthrough cases by age group and severity

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	154	1	0
10-19	19,251	47	0
20-29	36,295	196	2
30-39	37,859	282	6
40-49	33,660	291	14
50-59	27,398	535	51
60-69	20,911	1,043	171
70-79	13,113	1,258	301
80+	7,836	1,344	575
Total	196,477	4,997	1,120

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Table 5. COVID-19 breakthrough case severity by race¹²

Race	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
> 1 race	1,441	37	3
American Indian/Alaska Native	2,509	70	8
Asian	6,688	127	22
Black	3,988	132	24
Not Available	57,344	627	248
Other	18,619	341	86
Pacific Islander	253	7	1
White	105,635	3,656	728
Total	196,477	4,997	1,120

Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
Hispanic	19,325	300	32
Not Hispanic	101,648	3,374	670
Unknown	75,504	1,323	418
Total	196,477	4,997	1,120

¹² During the case investigation, people are asked to self-report their race, ethnicity, tribal affiliation, country of origin or ancestry. As of October 2021, 42,423 (80.8%) of the 52,483 persons who identified as "Other" race also self-identified as Hispanic or Latino.

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Table 7 provides the proportion of vaccine breakthrough cases who have died with COVID-19. Approximately 80% of vaccine breakthrough deaths have occurred in patients 70 years and older. The proportion of vaccine breakthrough cases who have died with COVID-19 has increased over time. This trend is expected as the proportion of the population which is fully vaccinated increases and may also be associated with waning immunity and the proportion of the population which has received a booster dose.

Table 7. COVID-19 deaths by month, by breakthrough case status¹³

Month	Total COVID-19 deaths	Breakthrough deaths	Percent breakthrough deaths
March 2021	126	4	3.2
April 2021	121	6	5.0
May 2021	222	19	8.6
June 2021	116	15	12.9
July 2021	95	16	16.8
August 2021	599	134	22.4
September 2021	918	197	21.5
October 2021	645	175	27.1
November 2021	399	93	23.3
December 2021	336	80	23.8
January 2022	565	203	35.9
February 2022	375	150	40.0

¹³ Data in Table 7 will be updated monthly and will reflect cases from the previous month.

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COVID-19 variants

Table 8. COVID-19 breakthrough cases associated with variants of concern¹⁴

Overall, approximately 6.1% of positive molecular specimens in Oregon have been sequenced. Omicron is currently the dominant variant circulating in Oregon. At this time, vaccine breakthrough cases appear to reflect the variants circulating in the community. Additional information on variants can be found here:

<https://public.tableau.com/app/profile/oregon.health.authority.covid.19/viz/GISAIDVariantDashboardUpdated/OregonVariantDashboard>.

Subtype	Breakthrough Cases
Omicron (B.1.1.529)	2,137
Delta (B.1.617.2)	2,420

Table 9. COVID-19 breakthrough cases associated with variants being monitored

Subtype	Breakthrough Cases
Alpha (B.1.1.7)	153
Beta (B.1.351)	17
Gamma (P.1)	63
Epsilon (B.1.427/B.1.429)	40
Iota (B.1.526)	30

¹⁴ As of September 29, 2021, OHA will align with CDC's classification of SARS-CoV-2 variants. Variant classification scheme defines four classes of SARS-CoV-2 variants: variants of concern, variants of interest, variants being monitored and variants of high consequence.

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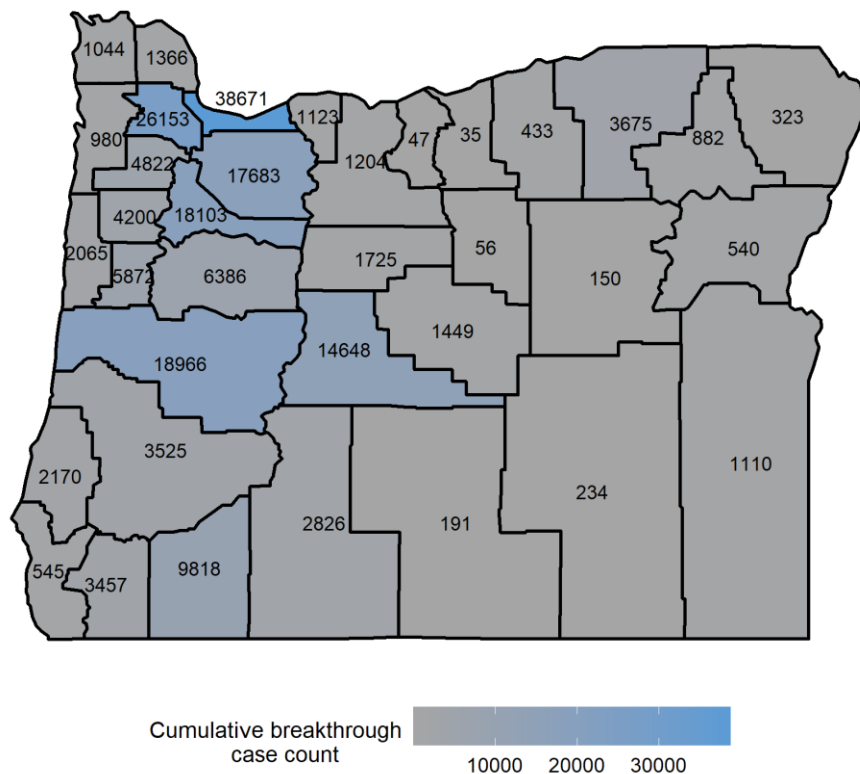
Breakthrough cases by county

Figure 3 and Table 10 show breakthrough cases by county. In general, cumulative breakthrough case counts correspond with the population size of each county. Additional information on cumulative cases can be found here:

<https://public.tableau.com/app/profile/oregon.health.authority.covid.19/viz/OregonCOVID-19TestingandOutcomesbyCounty/OregonsCOVID-19TestingandOutcomesbyCounty>.

Table 10 provides both cumulative and weekly data. The “Cases in previous week” column references the number of vaccine breakthrough cases newly reported between March 13 and March 19. This count may not reflect the full number of vaccine breakthrough cases that occurred during this time, as breakthrough case ascertainment may lag up to several weeks.

Figure 3. Map of COVID-19 breakthrough case cumulative counts, by county of residence¹⁵



¹⁵ Counties that have a total of fewer than 10 cases will appear grey without a data label.

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Table 10. COVID-19 breakthrough cases by county of residence¹⁶

County	Cumulative cases	Cases in previous week
Baker	540	0
Benton	5872	20
Clackamas	17683	49
Clatsop	1044	1-9
Columbia	1366	1-9
Coos	2170	14
Crook	1449	1-9
Curry	545	1-9
Deschutes	14648	72
Douglas	3525	10
Gilliam	35	0
Grant	150	0
Harney	234	1-9
Hood River	1123	1-9
Jackson	9818	30
Jefferson	1725	1-9
Josephine	3457	10
Klamath	2826	1-9
Lake	191	0

¹⁶ Counties that have a total of fewer than 10 cases will be reported as 1-9 cases.

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County	Cumulative cases	Cases in previous week
Lane	18966	92
Lincoln	2065	1-9
Linn	6386	16
Malheur	1110	1-9
Marion	18103	44
Morrow	433	1-9
Multnomah	38671	190
Polk	4200	16
Sherman	47	0
Tillamook	980	1-9
Umatilla	3675	1-9
Union	882	1-9
Wallowa	323	0
Wasco	1204	1-9
Washington	26153	108
Wheeler	56	0
Yamhill	4822	15