

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Weekly Vaccine Breakthrough Case Report March 17, 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.

Errata: An earlier version of this report included an error in cases within the last MMWR week. This has been corrected.

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: www.cdc.gov/vaccines/covid-19/downloads/COVID-vaccine-breakthrough-case-investigations-Protocol.pdf.

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

⁴ Bergwerk M, Gonen T, Lustig Y, et al. Covid-19 breakthrough infections in vaccinated health care workers. NEJM 2021; 385:1474–84. Available at www.nejm.org/doi/full/10.1056/nejmoa2109072.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



COVID-19 cases by vaccination status

Weekly summary

During the week of March 6–March 12, there were 2,532 cases of COVID-19 reported to OHA. Of these, 1,584 (62.6%) were unvaccinated, 945 (37.4%) were vaccine breakthrough cases, and 3 (0.1%) had an unknown vaccination status. Of all vaccine breakthrough cases, 468 (49.5%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 51 years. There were 7 (0.7%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 245 (25.9%) cases in persons 65 or older. There were 43 (4.6%) 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
2022-02-05	29,385	29,290	99.7	14,275	48.7
2022-02-12	18,061	18,021	99.8	8,829	49.0
2022-02-19	9,875	9,857	99.8	4,650	47.2
2022-02-26	5,580	5,571	99.8	2,643	47.4
2022-03-05	4,100	4,098	100.0	1,728	42.2
2022-03-12	2,532	2,529	99.9	945	37.4

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Cumulative summary

Overall, 195,600 vaccine breakthrough cases have been identified in Oregon. Of these, 45,386 (23.2%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5–108). There were 2,661 (1.4%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. 30,261 (15.5%) cases were 65 or older. There have been a total of 13,089 (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 3.5 times the rate among those who were fully vaccinated and 4.5 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.

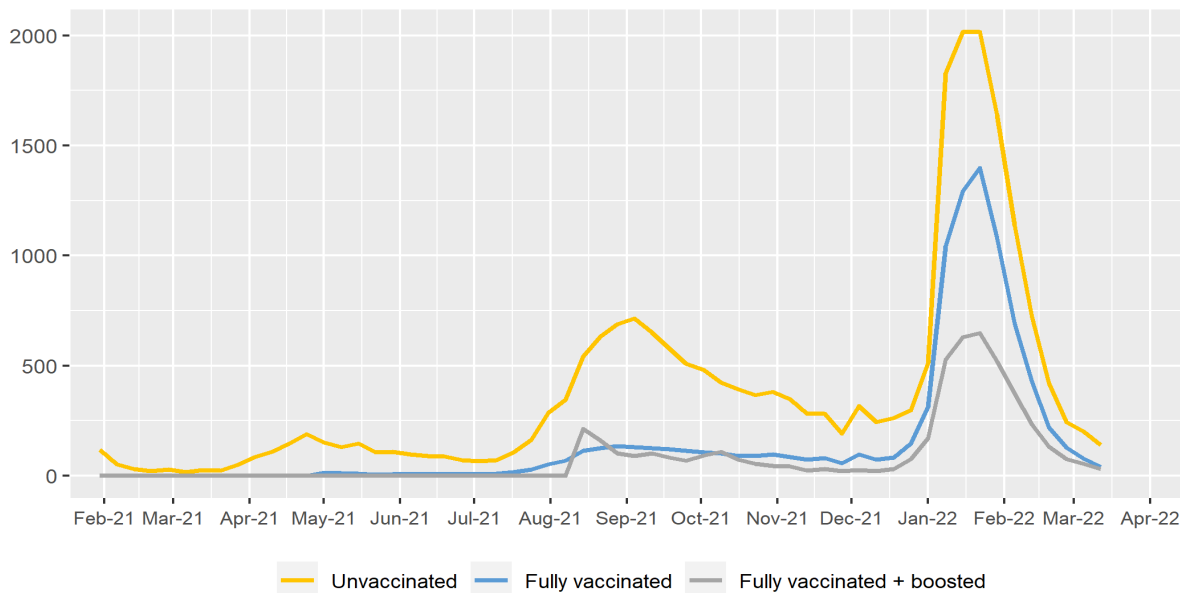
⁵ Unvaccinated persons are defined as people who have not received an approved COVID-19 vaccine, or who have not completed a COVID-19 vaccine series.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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



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

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

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.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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	1,661,171	115,838	2,496	578	6,973.3
Moderna	970,776	60,634	1,694	351	6,245.9
Johnson & Johnson/Janssen	244,500	19,100	738	157	7,811.9

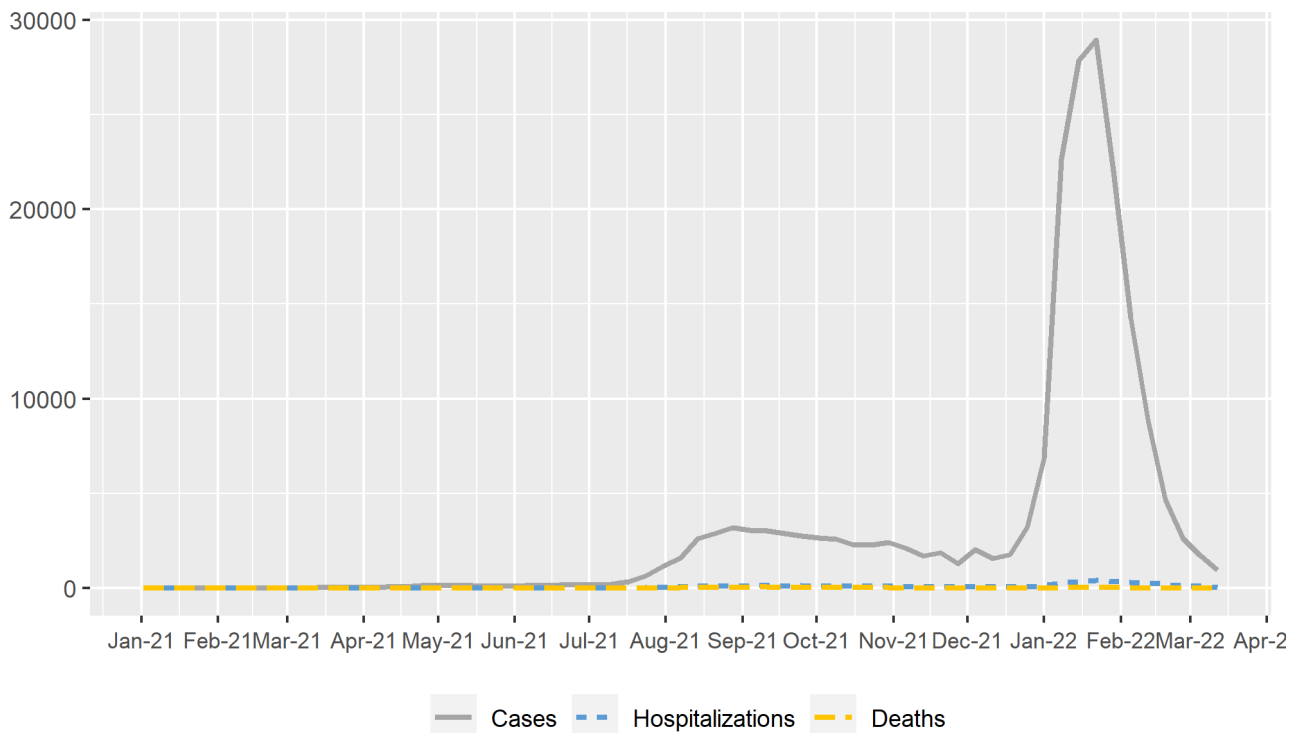
⁸ Table 2 provides the number of cases per 100,000 vaccinated individuals by primary series vaccine manufacturer. Because this figure does not account for the time that each person has been fully vaccinated, it is not a true rate and should not be interpreted as such.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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



Individuals who are fully vaccinated and boosted have an even lower 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>.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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

Case type	Cases	Hospitalizations	Deaths
Fully vaccinated + boosted	44,502	822	116
Fully vaccinated	137,756	4,068	970
Unvaccinated	258,013	14,452	3,595

To date, 2.5% of all known breakthrough cases have been hospitalized (n=4,933), and only 0.6% have died (n=1086).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 risks of both hospitalization and death increase 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.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	155	1	0
10-19	19,194	48	0
20-29	36,155	193	2
30-39	37,748	280	5
40-49	33,544	286	14
50-59	27,255	529	48
60-69	20,784	1,028	168
70-79	12,999	1,241	291
80+	7,766	1,327	558
Total	195,600	4,933	1,086

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Table 5. COVID-19 breakthrough case severity by race¹²

Race	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
> 1 race	1,401	36	2
American Indian/Alaska Native	2,494	68	8
Asian	6,660	124	22
Black	3,974	125	23
Not Available	57,143	628	230
Other	18,564	337	85
Pacific Islander	252	7	1
White	105,112	3,608	715
Total	195,600	4,933	1,086

Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
Hispanic	19,268	295	28
Not Hispanic	101,055	3,289	621
Unknown	75,277	1,349	437
Total	195,600	4,933	1,086

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.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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	644	175	27.2
November 2021	399	93	23.3
December 2021	336	80	23.8
January 2022	543	197	36.3
February 2022	331	131	39.6

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

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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)	2,113
Delta (B.1.617.2)	2,419

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 has aligned with CDC's classification of SARS-CoV-2 variants. The 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.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



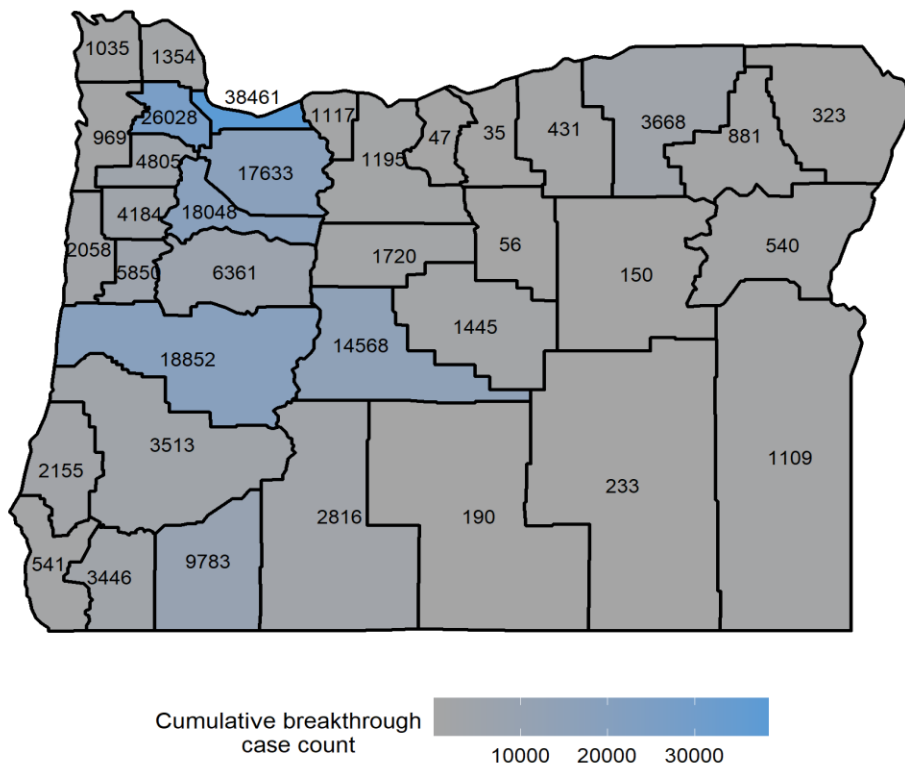
Breakthrough cases by county

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 6 and March 12. This count may not reflect the full number of vaccine breakthrough cases that occurred during this time, as breakthrough case ascertainment can lag by several weeks.

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



¹⁵ Counties with fewer than 10 cases will appear grey without a data label.

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



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

County	Cumulative cases	Cases in previous week
Baker	540	1-9
Benton	5850	23
Clackamas	17633	70
Clatsop	1035	1-9
Columbia	1354	13
Coos	2155	23
Crook	1445	12
Curry	541	1-9
Deschutes	14568	80
Douglas	3513	25
Gilliam	35	0
Grant	150	0
Harney	233	1-9
Hood River	1117	1-9
Jackson	9783	58
Jefferson	1720	1-9
Josephine	3446	23
Klamath	2816	11

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

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



County	Cumulative cases	Cases in previous week
Lake	190	1-9
Lane	18852	122
Lincoln	2058	14
Linn	6361	24
Malheur	1109	1-9
Marion	18048	61
Morrow	431	0
Multnomah	38461	200
Polk	4184	15
Sherman	47	1-9
Tillamook	969	1-9
Umatilla	3668	1-9
Union	881	0
Wallowa	323	0
Wasco	1195	1-9
Washington	26028	117
Wheeler	56	0
Yamhill	4805	11