

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Weekly Vaccine Breakthrough Case Report - February 17, 2022

Background

Data for the weekly breakthrough case report will include data through the most recent Sunday and the report will be published on Thursdays.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 which 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. As case counts have increased dramatically during the Omicron surge, our database has been unable to match the entire volume of reported cases. At the same time, case investigation has pivoted to an opt-in model in which public health no longer actively reaches out to cases outside of high-risk congregate settings. Therefore, the vaccination status of approximately one-third of recent cases remains unknown. Oregon Health Authority (OHA) is working towards alternative methods to identify vaccination status for all reported cases in a timely manner.

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.³ Therefore, the true number of vaccine breakthrough cases is unknown. The number of 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 people in Oregon 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 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 February 6–February 12, there were 18,041 cases of COVID-19. Of these, 7,834 (43.4%) were unvaccinated, 8,732 (48.4%) were vaccine breakthrough cases, and 1,475 (8.2%) had an unknown vaccination status. Of all vaccine breakthrough cases, 3,330 (38.1%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 50 years. There were 67 (0.8%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 1,706 (19.5%) cases in persons 65 or older. There were 540 (6.2%) cases aged 12-17.

OHA publishes the most up-to-date information 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
2022-01-08	45,308	35,933	79.3	22,332	62.1
2022-01-15	55,571	41,691	75.0	21,509	51.6
2022-01-22	56,982	40,862	71.7	20,523	50.2
2022-01-29	44,405	34,364	77.4	16,782	48.8
2022-02-05	29,392	27,799	94.6	13,457	48.4
2022-02-12	18,041	16,566	91.8	8,732	52.7

Cumulative summary

Overall, there have been 164,511 vaccine breakthrough cases identified in Oregon. Of all vaccine breakthrough cases, 34,692 (21.1%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5-108). 2,436 (1.5%) breakthrough cases were

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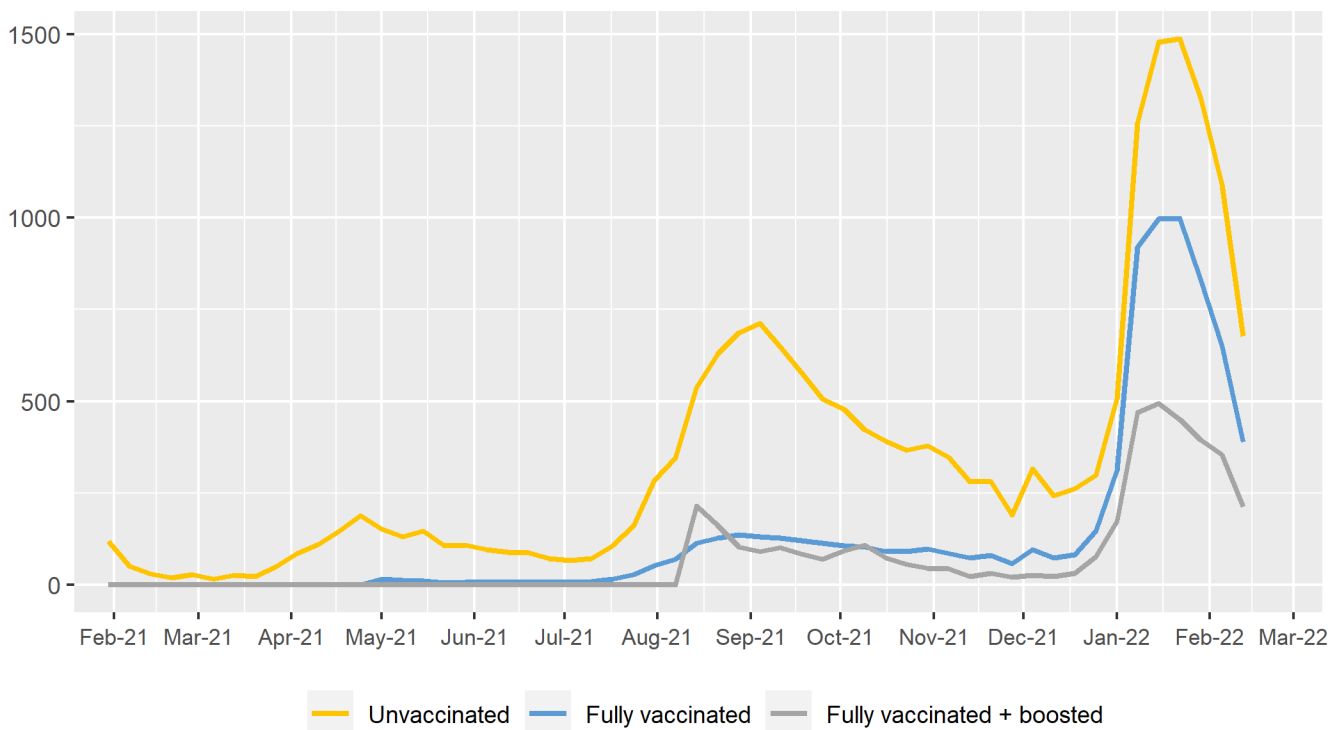
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residents of care facilities, senior living communities or other congregate living settings. 25,725 (15.6%) cases were 65 or older. There have been a total of 10,644 (6.5%) cases aged 12-17.

Cases of COVID-19 are much more common in unvaccinated⁴ individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in the most recent week was nearly twice the rate of COVID-19 cases among those who are fully vaccinated and more than 3 times the rate of COVID-19 cases among those who are fully vaccinated and boosted. Community spread is extreme throughout the state. As COVID-19 cases have increased across Oregon, vaccine breakthrough cases have also increased, but at a much lower rate than in the unvaccinated. 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 status⁵



⁴ 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.

⁵ 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).⁶

Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity⁷

Primary series vaccine manufacturer	Primary series completed	Cases	Hospitalizations	Deaths	Cases per 100,000 vaccinated
Pfizer	1,640,183	97,217	2,122	484	5,927.2
Moderna	965,860	50,770	1,437	267	5,256.5
Johnson & Johnson/Janssen	242,997	16,495	646	121	6,788.1

⁶ 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.

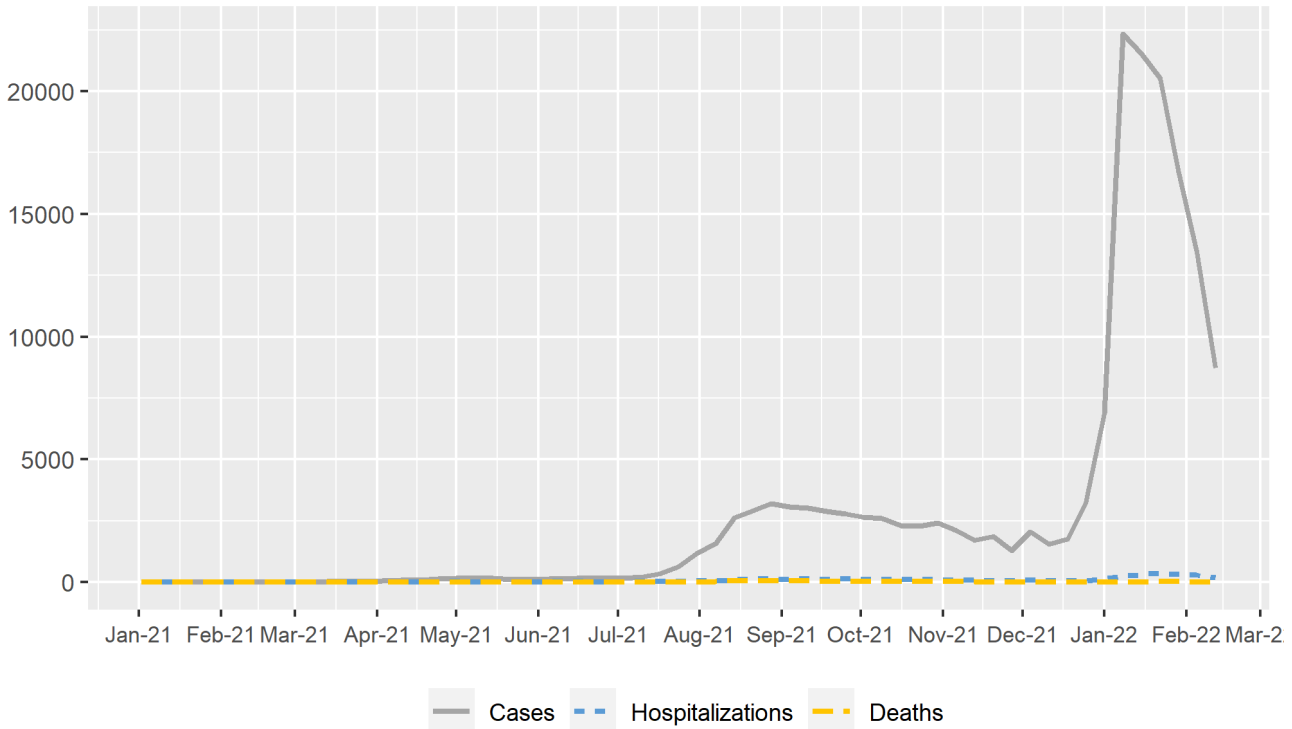
⁷ Table 2 provides the number of cases per 100,000 vaccinated individuals by primary series vaccine manufacturer. Because this figure does not account for the time that each person has been fully vaccinated, it is not a true rate and should not be interpreted as such.

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



Individuals who are fully vaccinated and boosted have an even lower risk of severe illness and death.⁸ 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.

⁸ <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 2021⁹

Case type	Cases	Hospitalizations	Deaths
Fully vaccinated + boosted	34,039	567	47
Fully vaccinated	119,645	3,610	825
Unvaccinated	231,605	13,619	3,302

To date, 2.6% of all known breakthrough cases have been hospitalized (n=4,211), and only 0.5% have died (n=872).¹⁰ The median age of the people who have died is 80 (range: 29-103). 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. Both the risk of hospitalization and death increase with age.

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

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	106	1	0
10-19	15,713	35	0
20-29	30,491	152	1
30-39	31,678	224	5

⁹ 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.

¹⁰ 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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Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
40-49	28,243	238	13
50-59	22,945	455	34
60-69	17,668	891	137
70-79	11,097	1,069	231
80+	6,569	1,146	451
Total	164,511	4,211	872

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Table 5. COVID-19 breakthrough case severity by race¹¹

Race	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
> 1 race	1,187	29	2
American Indian/Alaska Native	2,182	60	8
Asian	5,528	102	15
Black	3,412	112	18
Not Available	47,529	537	181
Other	15,345	286	70
Pacific Islander	225	6	1
White	89,103	3,079	577
Total	164,511	4,211	872

Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
Hispanic	15,879	242	21
Not Hispanic	85,326	2,807	488
Unknown	63,306	1,162	363
Total	164,511	4,211	872

¹¹ 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 identify as “Other” race also self-identify 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 increased over time and appears to have stabilized. This trend is likely multifactorial and may be associated with the proportion of the population which has received a booster dose and reduced disease severity associated with infection caused by the Omicron variant.

Table 7. COVID-19 deaths by month, by breakthrough case status¹²

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	598	134	22.4
September 2021	919	197	21.4
October 2021	646	176	27.2
November 2021	398	93	23.4
December 2021	332	79	23.8
January 2022	306	89	29.1

¹² 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 concern¹³

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)	1,003
Delta (B.1.617.2)	2,281

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

¹³ 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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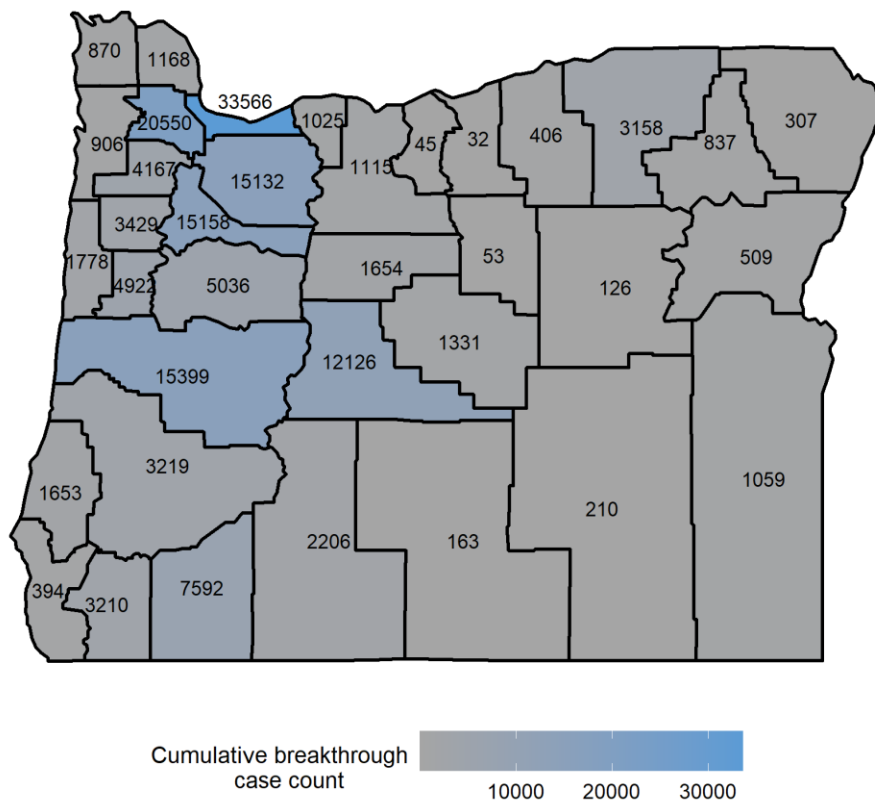
Breakthrough cases by county

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 February 6 and February 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 residence¹⁴



¹⁴ 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 residence¹⁵

County	Cumulative cases	Cases in previous week
Baker	509	26
Benton	4922	322
Clackamas	15132	671
Clatsop	870	53
Columbia	1168	76
Coos	1653	106
Crook	1331	90
Curry	394	48
Deschutes	12126	552
Douglas	3219	195
Gilliam	32	1-9
Grant	126	1-9
Harney	210	15
Hood River	1025	57
Jackson	7592	539
Jefferson	1654	92
Josephine	3210	198
Klamath	2206	162
Lake	163	1-9

¹⁵ 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	15399	1018
Lincoln	1778	125
Linn	5036	349
Malheur	1059	54
Marion	15158	728
Morrow	406	1-9
Multnomah	33566	1371
Polk	3429	196
Sherman	45	1-9
Tillamook	906	50
Umatilla	3158	94
Union	837	37
Wallowa	307	11
Wasco	1115	39
Washington	20550	1208
Wheeler	53	12
Yamhill	4167	209