

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Weekly Vaccine Breakthrough Case Report - January 27, 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 CDC.

This report only includes vaccine breakthrough cases from positive test results reported to public health. 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 also 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.

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 January 16–January 22, there were 57,011 cases of COVID-19. 40,594 (71.2%) were unvaccinated and 16,417 (28.8%) were vaccine breakthrough cases. Of all vaccine breakthrough cases, 4,580 (27.9%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 46 years. 98 (0.6%) breakthrough cases were residents of care facilities, senior living communities or other congregate living settings. 1838 (11.2%) cases were 65 or older. There were 1469 (8.9%) 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	Breakthrough cases	Percent breakthrough case
2021-12-18	5,368	1,755	32.7
2021-12-25	6,961	3,235	46.5
2022-01-01	15,233	6,511	42.7
2022-01-08	45,319	15,158	33.4
2022-01-15	55,597	11,675	21.0
2022-01-22	57,011	16,417	28.8

Cumulative summary

Overall, there have been 104,088 vaccine breakthrough cases identified in Oregon. Of all vaccine breakthrough cases, 15,392 (14.8%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 42 years (range: 5-106). 2,005 (1.9%) breakthrough cases were residents of care facilities, senior living communities or other congregate living settings. 17,668 (17%) cases were 65 or older. There have been a total of 5,785 (5.6%) cases aged 12-17.

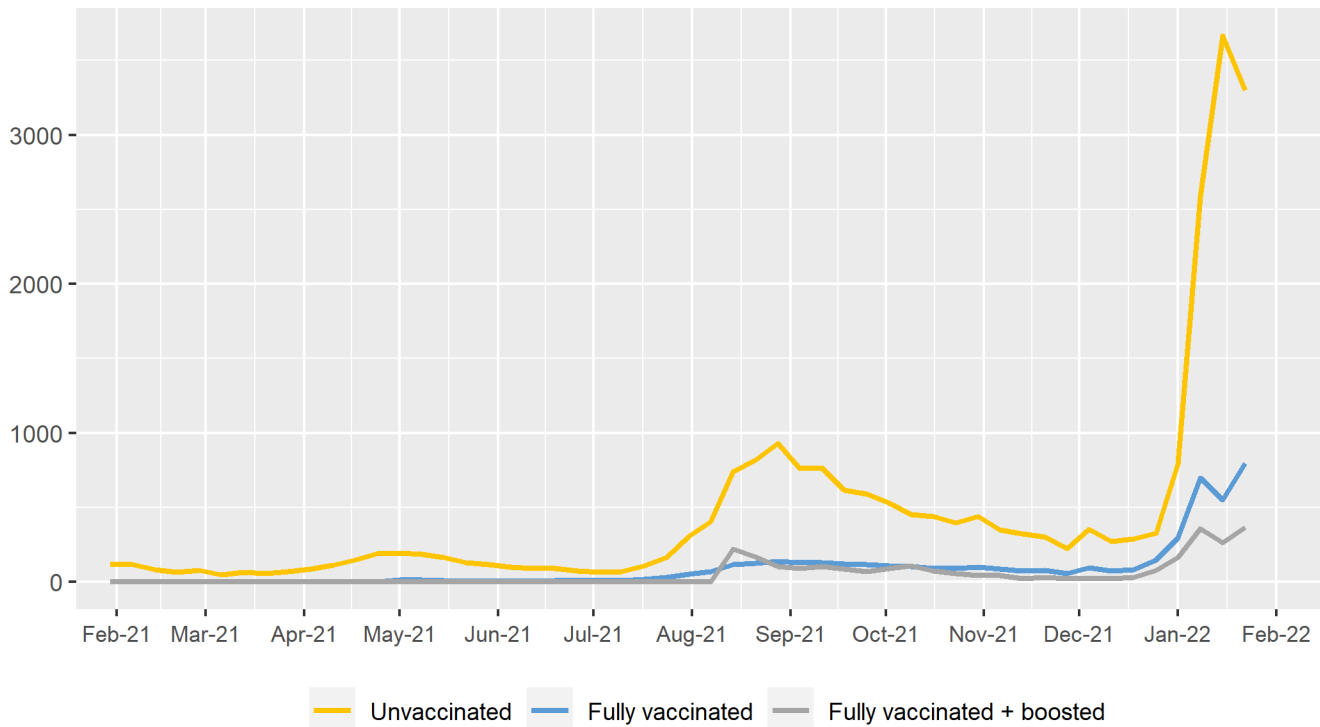
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Cases of COVID-19 are much more common in unvaccinated⁴ individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in the most recent week was over 4 times the rate of COVID-19 cases among those who are fully vaccinated and nearly 9 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 status



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

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.

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manufacturer and severity. Relatively few breakthrough cases have been hospitalized, and even fewer have died (Figure 2).⁵

Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity⁶

Vaccine manufacturer	Primary series completed	Cases	Hospitalizations	Deaths	Cases per 100,000 vaccinated
Pfizer	1,615,019	57,663	1,410	383	3,570.4
Moderna	960,290	29,045	909	203	3,024.6
Johnson & Johnson/Janssen	241,329	10,322	455	97	4,277.1

Individuals who are fully vaccinated and boosted have an even lower risk of severe illness and death.⁷ 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.

⁵ 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.

⁶ Table 2 provides the number of cases per 100,000 vaccinated individuals by 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.

⁷ <https://covid.cdc.gov/covid-data-tracker/#covidnet-hospitalizations-vaccination>.

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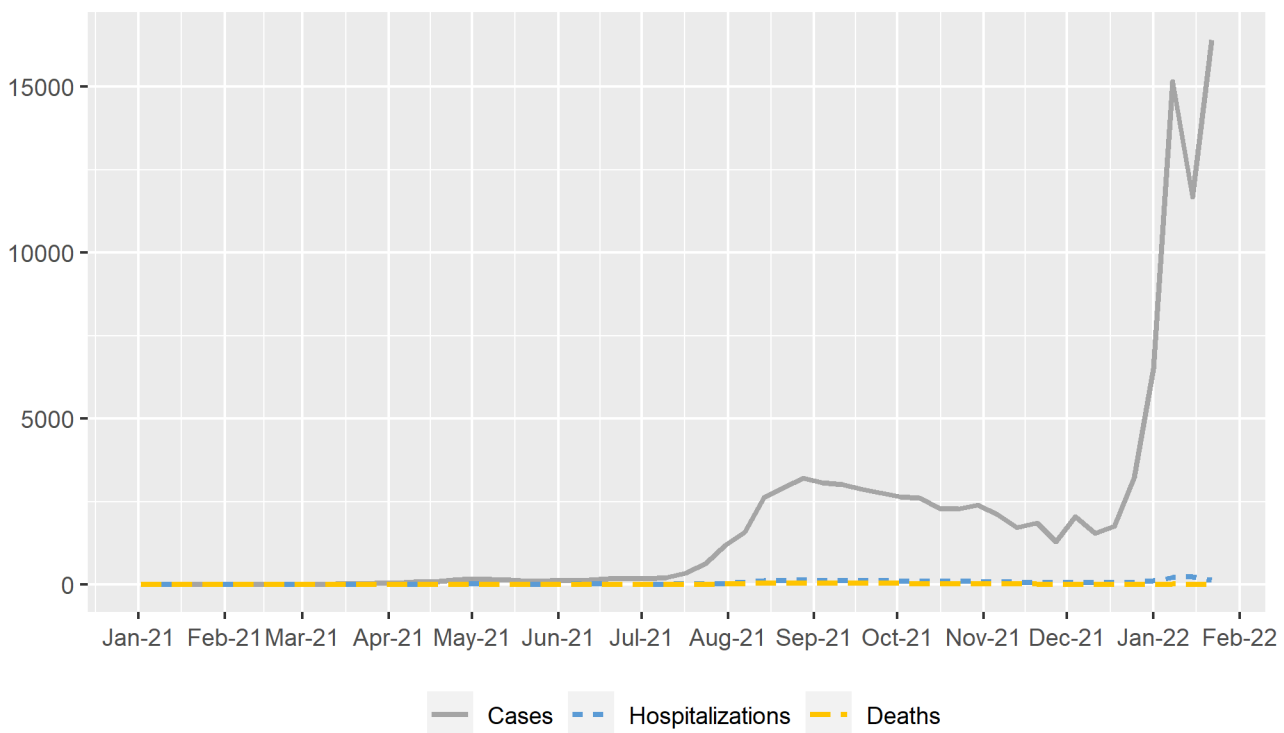
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Table 3. COVID-19 breakthrough cases in adults, by vaccination status and severity

Case type	Cases	Hospitalizations	Deaths
Fully vaccinated + boosted	15,159	248	23
Fully vaccinated	83,059	2,796	717
Unvaccinated	395,602	20,525	5,251

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



To date, 2.9% of all known breakthrough cases have been hospitalized (n=3,069), and only 0.7% have died (n=740).⁸ The median age of the people who have died is 81 (range: 29-103). It is important to

⁸ 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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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	43	1	0
10-19	8,782	22	0
20-29	19,054	98	1
30-39	19,959	145	3
40-49	17,744	164	10
50-59	14,616	311	29
60-69	11,672	640	111
70-79	7,683	805	192
80+	4,535	883	394
Total	104,088	3,069	740

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Table 5. COVID-19 breakthrough case severity by race⁹

Race	Cases	Hospitalizations	Deaths
> 1 race	884	24	2
American Indian/Alaska Native	1,396	39	7
Asian	3,360	72	15
Black	2,154	86	16
Not Available	28,278	400	155
Other	9,188	193	64
Pacific Islander	173	5	1
White	58,655	2,250	480
Total	104,088	3,069	740

Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Cases	Hospitalizations	Deaths
Hispanic	9,187	157	17
Not Hispanic	54,666	2,045	408
Unknown	40,235	867	315
Total	104,088	3,069	740

⁹ 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 status¹⁰

Month	Total COVID-19 deaths	Vaccine breakthrough deaths	Percent vaccine breakthrough deaths
March 2021	124	4	3.2
April 2021	119	6	5.0
May 2021	217	19	8.8
June 2021	115	15	13.0
July 2021	94	16	17.0
August 2021	593	132	22.3
September 2021	909	193	21.2
October 2021	643	175	27.2
November 2021	395	91	23.0
December 2021	241	53	22.0

¹⁰ 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 concern¹¹

Overall, approximately 6.4% 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	Cases
Omicron (B.1.1.529)	277
Delta (B.1.617.2)	2,170

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

Subtype	Cases
Alpha (B.1.1.7)	152
Beta (B.1.351)	17
Gamma (P.1)	63
Epsilon (B.1.427/B.1.429)	40
Iota (B.1.526)	30

¹¹ 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 January 16 and January 22. 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.

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Figure 3. Map of COVID-19 breakthrough case cumulative counts, by county of residence¹²

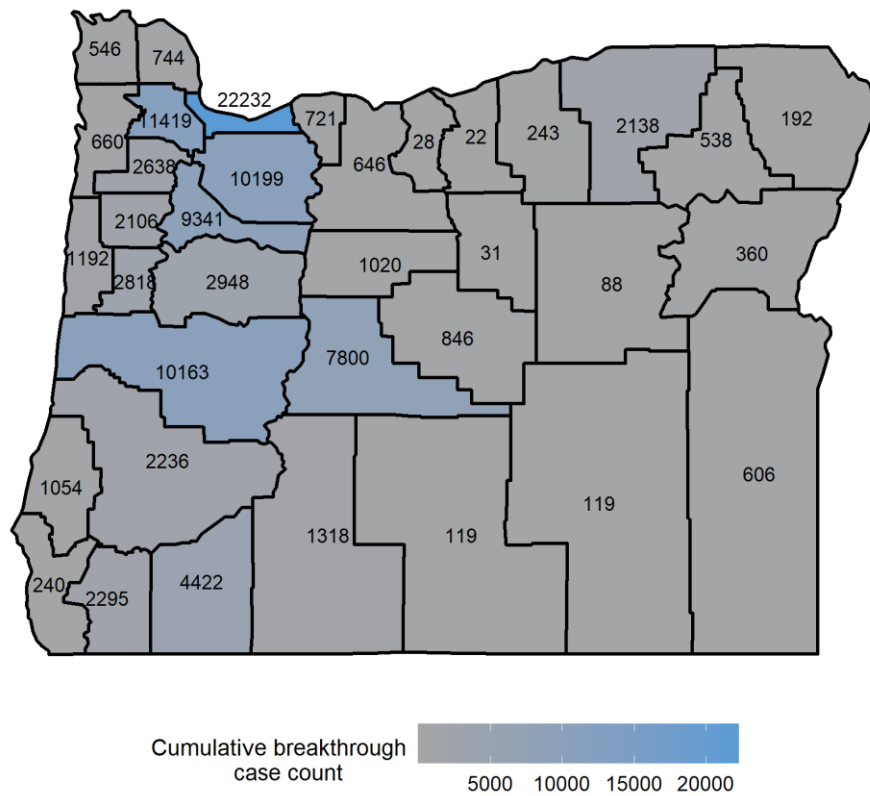


Table 10. COVID-19 breakthrough cases by county of residence¹³

County	Cumulative cases	Cases in previous week
Baker	360	65
Benton	2818	659
Clackamas	10199	1590

¹² Counties that have a total of fewer than 10 cases will appear grey without a data label.

¹³ 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
Clatsop	546	66
Columbia	744	110
Coos	1054	131
Crook	846	143
Curry	240	30
Deschutes	7800	1063
Douglas	2236	261
Gilliam	22	1-9
Grant	88	1-9
Harney	119	1-9
Hood River	721	88
Jackson	4422	820
Jefferson	1020	179
Josephine	2295	328
Klamath	1318	250
Lake	119	20
Lane	10163	1158
Lincoln	1192	216
Linn	2948	657
Malheur	606	125
Marion	9341	1663

Data are provisional and subject to change.

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County	Cumulative cases	Cases in previous week
Morrow	243	36
Multnomah	22232	2902
Polk	2106	388
Sherman	28	1-9
Tillamook	660	83
Umatilla	2138	391
Union	538	95
Wallowa	192	28
Wasco	646	62
Washington	11419	2320
Wheeler	31	1-9
Yamhill	2638	470